

# Hypnotizability and Dissociation in Dietary Restraint.

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## **Abstract**

The literature on hypnotizability and dissociation was reviewed in relation to patterns of clinical and non-clinical eating behaviours. Included was a theoretical interpretation of the significantly higher rates of hypnotizability and dissociation in certain eating disordered groups, such as bulimics, compared to age matched controls. However, non-clinical investigations between hypnotizability, dissociation, and problematic eating patterns were focused on in particular. Two principle hypotheses emerged from this review. First, the Socio-Hypnotic hypothesis (e.g. Groth-Marnat & Schumaker, 1990; Frاسquilho & Oakley, 1997) suggested that hypnotic suggestibility may influence the internalisation of socio-cultural pressure to be thin. Second, the Dissociative Escape Hypothesis proposes that a vulnerability to experience dissociative phenomena as a potential defence mechanism may lead individuals to disinhibit eating behaviour when faced with aversive cognitions (based on Heatherton & Baumeister, 1991; McManus, 1995; Frاسquilho & Oakley, 1997). These hypotheses were framed in terms of a social-cultural model of problematic eating (Stice, 1994). After reviewing the concepts behind the definitions and measurements of hypnotizability, different types of dissociation, dietary restraint, and disinhibited eating, four studies sought to explore associations between these factors within a non-clinical female college student population. Study 1 (n = 40) examined the relationship between types of restraint and non-hypnotic suggestions relating to imagining body size increase and decrease, in the context of body related anxiety, disinhibition of eating, and imagery based suggestibility. Study 2 (n= 87) and Study 3 (n = 123) used correlational and regression techniques to examine relationships between a widely used test of hypnotizability and tests of cognitive and affective dissociation in relation to a number of dietary restraint and disinhibition of eating measures. Study 4 (n = 50) examined differences between restrainers and non-restrainers on a behavioural index of body shape and food concerns based on a Stroop-type paradigm and examined these concerns in relation to dissociation and hypnotizability. The Socio-Hypnotic hypothesis was weakly supported by correlation evidence, though regression analyses revealed more complex effects. While correlations involving dissociation needed to control for depression, different types of dissociation may relate to different features of both disinhibited eating and dietary restraint. These results were summarised and discussed in the final chapter and future research possibilities examined.

*To My Parents, Francisco José Frasquilho  
and Maria de Fatima Frasquilho*

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# Contents

Abstract	2
Acknowledgements	4
List of Tables	15
List of Illustrations	18
List of Abbreviations	19

## **1 Hypnotizability and dissociation in relation to clinical and non-clinical eating patterns.**

Chapter overview	20
1.1 General introduction to the thesis	20
1.1.2 Three principle theoretical perspectives	21
1.2. Hypnosis, Dissociation, and Psychopathology: Clinical and non-clinical eating patterns associated with hypnotizability and dissociation	22
1.2.2. Hypnotizability in relation to clinical patterns of disordered eating	24
1.2.3. Summary and conclusions of hypnotizability and clinical patterns of eating behaviour	29
1.2.4. Dissociation and clinical patterns of disordered eating	32
1.2.4.1 Subjective reports of dissociative states in bulimics and bulimia nervosa	32
1.2.4.2. Self-report studies of dissociation in eating disordered samples	34

1.2.5.	The nature of dissociation in eating disordered individuals: Issues of methodological heterogeneity and theoretical links with defence and escape	42
1.2.5.2.	Theoretical models of dissociation in clinically disordered eating behaviour	45
1.2.5.3.	Conclusions	47
1.3.	Hypnotizability and dissociation in non-clinical patterns of eating behaviours and attitudes: The central focus of the thesis	48
1.3.2.	Continuity and discontinuity between non-clinical restrained eating and clinical eating difficulties: The basis for a potential continuum?	50
1.3.3.	Hypnotizability and patterns of eating attitudes in non-patient samples	53
1.3.4.	Dissociation and eating patterns in non-clinical populations	57
1.3.5.	Summary of hypnosis and dissociation in relation to patient eating patterns: Principle frameworks for hypotheses	62
1.4.	Summary of Chapter one	64

## **2 Theories, definition and measurement of hypnotizability, dissociation, and dietary restraint.**

Chapter Overview	65
2.1. Defining and measuring the concepts of hypnotizability and dissociation	65
2.1.1. Defining hypnosis and hypnotizability	66
2.1.2 The semantics of hypnosis	67
2.1.3. Hypnotizability and suggestibility	71
2.1.4. Defining the concept of dissociation	72
2.1.5. Dissociative continuities and discontinuities: The functions of dissociation	73
2.1.6. Dissociation, suggestion, and hypnotizability.	75
2.1.6.2. Dissociation theories of hypnosis	76
2.1.6.3. Empirical evidence for the causal role of dissociation-type processes in hypnosis and hypnotic responding.	81
2.1.6.4. Conclusions on dissociation theories of hypnosis.	85
2.1.7. Measurement of hypnotizability and dissociation: Correlates, problems and insights	87
2.1.8. The Socio-Hypnotic Approach: Complex components, incompatibility with dissociation theories of hypnosis, and implications for the restraint and disinhibition of eating.	95
2.1.8.2. The theoretical focus of the Socio-Hypnotic Approach	95
2.1.8.3. Components of the Socio-Hypnotic Approach	97
2.1.8.4. Socio-Hypnotic Approach versus Dissociation Theories of hypnosis.	105



2.2.	The constructs of dietary restraint and dietary disinhibition	108
2.2.2.	Origins of the restrained eating construct and a word of caution about the use of terms ‘dietary restraint’, ‘restrained eating’, and ‘dieting’	109
2.2.3.	The paradox of disinhibition: Restrained eaters’ reactions to pre-load consumption and emotional stress	112
2.2.4.	The boundary model of restraint and the need to differentiate dieting from restrained eating concerns	120
2.2.5.	Advancing the restraint construct: Alternative measures of the restraint and their psychometric properties	125
2.2.6.	Summary of the restrained eating construct: The importance of multivariate exploration of restraint and the hypothetical relationships with hypnotizability and dissociation	132
2.3.	Dieting concerns and behaviours in the general population: Socio-cultural, evolutionary, and developmental factors	133
2.3.2.	Interactions between evolutionary, developmental, and social factors in relation to female body aesthetics	137
2.4.	Stice’s model of socio-cultural factors and their relation to bulimia nervosa: The incorporation of restraint, disinhibition, hypnotizability, and dissociation	140
2.5.	Summary of Chapter two and methodological issues for the thesis.	149
2.5.2.	Measures of Hypnotizability	150
2.5.3.	Measures of Dissociation	152
2.5.4.	Measures of dietary restraint and disinhibition	155
2.5.5.	Other measures and final issues of importance	157
2.6.	Summary of the principle hypotheses examined in the thesis	158

### **3 Study 1: ‘Waking’ suggestibility and suggested body image changes in relation to aspects of dietary restraint, dietary disinhibition, and body anxiety.**

Chapter Overview	160
3.1. Introduction to Study 1	160
3.2. Methods	166
3.3. Results	170
3.3.1. Data distributions and data cleaning	170
3.3.2. Overall means and reliabilities	170
3.3.3. Counterbalancing of suggested body image items and test administration	171
3.3.4. Participant and dietary demographics	172
3.3.5. Correlational analysis of ‘waking’ suggestibility and suggested body image changes, in relation to dietary restraint and body anxiety	173
3.3.6. ANOVAs of suggested body image change by restraint groupings	176
3.3.7. The effects of counterbalancing procedures on suggested body image change in relation to restraint groupings	178
3.4. Discussion of study 1	181

## **4 Study 2: Hypnotizability, dissociation, dietary restraint, and dietary disinhibition: A preliminary investigation of associations.**

Chapter overview	189
4.1. Introduction to study 2	189
4.2. Methods	194
4.3. Results	200
4.3.1. Data distributions and data cleaning	200
4.3.2. Overall means and reliabilities	201
4.3.3. Participant and dietary demographics	202
4.3.4. Correlational analyses	203
4.3.4.1 General correlations involving hypnotizability and dissociation	203
4.3.4.2. Sub-scale analysis of the dissociation scales, and taxonomic associations	205
4.3.5. Regression Analysis	208
4.3.6. Path Analysis of a simple model of restraint-disinhibition	212
4.4. Discussion of study 2	216
4.5. DES II means	222

## **5 Study 3: A partial replication of study 2 findings with an examination of body dissatisfaction, depression, different types of restraint and loss of control eating.**

Chapter overview	225
5.1. Introduction to study 3	225
5.2. Method	230
5.3. Results	235
5.3.1. Data distributions and data cleaning	235
5.3.2. Overall means and reliabilities	238
5.3.3. Participant and dietary demographics	239
5.3.4. Correlation and factor analysis of dietary measures	239
5.3.5. Correlational analysis of hypnotizability, dissociation, and dietary restraint/disinhibition measures	242
5.3.5.2. Hypnotic Spectrum Analysis of factor scores	245
5.3.5.3. Correlations involving the dissociation sub-scales	247
5.3.6. Regression analyses for non-pathological dietary restraint variables	250
5.3.6.2. Assessing potential moderating effects of hypnotizability and dissociation between non-clinical variables	254
5.4. Discussion of study 3	259

## **6 Study 4: Response latencies of restrained and non-restrained eaters to shape- and food- related words: An examination of relationships with dissociation and hypnotizability.**

Chapter Overview.	270
6.1. Introduction to study 4	270
6.2. Methods	276
6.3. Results	280
6.3.1 Data distributions and data cleaning	280
6.3.2. Participant and dietary demographics	282
6.3.3. ANOVAs for colour naming latencies based on restraint groupings	283
6.3.4. Correlations between colour latencies for food/body shape words and general measures of dietary restraint and disinhibition	284
6.3.4.2. Correlations involving dissociation sub-scales	286
6.4. Discussion of study 4	287

## **7 General Summary and Conclusions.**

Chapter overview	293
7.1. Initial Background and aims of the thesis	293
7.2. Hypnotizability and patterns of non-clinical dietary concerns and behaviours	295
7.2.2 Reconsidering the roles of hypnosis and hypnotizability in relation to the themes examined in the thesis.	299
7.3. Waking suggestibility, body image malleability, and Stroop latencies for body shape and food words	301
7.4. Dissociation and non-clinical patterns of dietary concerns and behaviours	304
7.5. Back to square one? Future directions.	308

<b>REFERENCES</b>	310
<b>APPENDIX A: Measures and questionnaires.</b>	333
<b>APPENDIX B: Body image suggestions from the Modified Creative Imagination Scale.</b>	355
<b>APPENDIX C: Inter-correlations between eating measures.</b>	356

Inside Back Cover

- Reprint of published paper:

Hypnotizability, dissociation, and three factors of eating behaviour.

- Reprint of published paper:

Hypnotizability and body image malleability in restrained and unrestrained eaters.

-Reprint of published paper:

Hypnotic susceptibility, or F-Bias: Its relevance to eating disorders.

## List of Tables

Table 1.1.	Studies examining level of hypnotizability in eating disordered populations	26
Table 1.2.	Studies examining level of dissociation in eating disordered individuals	37
Table 2.1.	Correlation matrix for three measures of restraint	130
Table 2.2.	Hypnotic suggestions used in the HGSHS:A	151
Table 3.1.	Means and internal reliabilities of measures	170
Table 3.2.	Correlations between suggestibility measures and dietary restraint related factors	174
Table 3.3.	Correlations between suggestibility measures and measures of body anxiety	175
Table 4.1.	Means and internal reliabilities of measures for study 2	202
Table 4.2.	Correlations matrix using hypnotizability and dissociation	204
Table 4.3.	Inter-correlations between hypnotizability and dissociation	205
Table 4.4.	Means and internal reliabilities for the dissociation measures sub-scales	206
Table 4.5.	Correlations between DES II sub-scales and measures of dietary restraint and disinhibition	207
Table 4.6.	Correlations between PAS sub-scales and measures of dietary restraint and disinhibition	208
Table 5.1.	Means and reliabilities for measures in study 4	238
Table 5.2.	Correlation matrix of dietary restraint and related measures	240
Table 5.3.	Factor structure of dietary restraint and related measures	242



Table 5.4.	Correlations with hypnotizability and dissociation total scores	243
Table 5.5.	Correlations with dissociation partialling out social desirability and depression	244
Table 5.6.	Inter-correlations between hypnotizability and dissociation measures	245
Table 5.7.	Hypnotic Spectrum Analysis of eating factors	246
Table 5.8.	Means and reliabilities of dissociation sub-scales	247
Table 5.9.	Correlations with cognitive dissociation (DES II) sub-factors and DES II taxon sub-scales	248
Table 5.10.	Correlations with the PAS sub-scales	250
Table 5.11.	Standard regression model for cognitive restraint	251
Table 5.12.	Standard regression model for concern for dieting	252
Table 5.13.	Block based regression analysis of disinhibition of eating	253
Table 5.14.	Examination of possible moderating effects of hypnotizability between cognitive restraint and fear of fat	255
Table 5.15.	Examination of possible moderating effects of hypnotizability between cognitive restraint and body dissatisfaction	255
Table 5.16.	Examination of possible moderating effects of hypnotizability between concern with dieting and fear of fat	256
Table 5.17.	Examination of possible moderating effects of hypnotizability between concern with dieting and body dissatisfaction	256
Table 5.18.	Examination of possible moderating effects of hypnotizability between fears of fat/weight gain and body dissatisfaction	256
Table 5.19.	Examination of possible moderating effects of affective dissociation between disinhibition of eating and cognitive restraint	257

Table 5.20.	Examination of possible moderating effects of affective dissociation between disinhibition of eating and concern with dieting	257
Table 5.21.	Examination of possible moderating effects of affective dissociation between disinhibition of eating and body dissatisfaction	258
Table 5.22.	Examination of possible moderating effects of affective dissociation between disinhibition of eating and fears of fat/weight gain.	258
Table 6.1.	Means and reliabilities for variables in study 4	281
Table 6.2.	Means and reliabilities for colour naming latencies for word categories in study 4	282
Table 6.3.	Means and standard deviations (in msec.) for body shape and food colour naming latencies in relation to different restraint types	283
Table 6.4.	Correlations between dietary restraint, dietary disinhibition, and the colour naming latencies for food and shape Stroop word.	285
Table 6.5.	Means and reliabilities for the dissociation sub-scales	286
Table 6.6.	Correlations between dissociation sub-scales and the Stroop derived food and body shape concern variables	287

## List of Illustrations

Figure 2.1.	Representation of Hilgard's (1973, 1977) Neo-Dissociation theory	78
Figure 2.2.	Representation of Woody and Bowers' (1994) Dissociated Control theory.	81
Figure 2.3.	Diagram representing Herman and Polivy's (1984) boundary model of eating regulation with additions to represent affects of pre-loads	121
Figure 2.4.	Stice's (1994) Social Model of Bulimia Nervosa	142
Figure. 3.1.	Graphs indicating level of subjective reality for suggested body image change scenarios in relation to different types of restraint groupings	177
Figure. 3.2.	Profile plots of the subjective reality of body image changes in relation to restraint status and order of body image items in the MCIS	179
Figure. 3.3.	Profile plots of the subjective reality of body image changes in relation to restraint status and order of body image items in the MCIS	180
Figure. 4.1.	Basic explorative path model of predictive routes for disinhibited eating	212
Figure. 4.2.	Basic path model with only the significant paths included.	214
Figure. 4.3.	Path diagram with social desirability used as a covariate in calculation of paths	215

## List Of Abbreviations

ANOVA	Analysis Of Variance
APA	American Psychological Association
BDI	Beck's Depression Inventory
BIM	Body Image Malleability
BMI	Body Mass Index
CD	Revised Restraint Scale Concern for Dieting sub-scale
CIS	Creative Imagination Scale
DEBQ	Dutch Eating Behaviour Questionnaire
DES	Dissociative Experiences Scale
DES-T	Dissociative Experiences Scale pathological taxon.
DID	Dissociative Identity Disorder
DIS-Q	Dissociation Questionnaire
EAT	Eating Attitudes Test
EDI	Eating Disorders Inventory
GFFS	Goldfarb Fear of Fat Scale
HGSHS:A	Harvard Groups Scale of Hypnotic Susceptibility
HIP	Hypnotic Induction Profile
KMO	Kaiser-Meyer-Olkin sampling adequacy statistic
MANOVA	Multivariate Analysis Of Variance.
MCIS	Modified Creative Imagination Scale(CIS with extra body image items)
MRC	Multiple Regression and Correlation
PAS	Perceptual Alteration Scale
PASTAS	Physical Appearance State and Trait Anxiety Scale
PRELIS	Pre-Linear Structural Models program
RRS	Revised Restraint Scale
SD	Standard deviation
SDS	Social Desirability Scale
SPSS	Statistical Package for the Social Sciences
SSHS	Stanford Susceptibility to Hypnosis Scale
TFEQ	Three Factor Eating Questionnaire
WF	Weight Fluctuation Revised Restraint Scale sub-scale

## **Chapter 1**

### **Hypnotizability and dissociation in relation to clinical and non-clinical eating patterns.**

#### **Chapter Overview.**

This chapter reviews the major empirical and theoretical work that forms the foundation of this thesis. Clinical studies originally revealed the potential association between disordered patterns of eating, heightened responsiveness to hypnotic suggestion, and the experience of dissociative phenomena. Further research using non-patient samples has begun to extend the hypothetical frameworks constructed in the clinical domain into the non-clinical arena. Research is reviewed suggesting a link between specific patterns of non-clinical eating defined in terms of dietary restraint and dietary disinhibition, and features of hypnotizability and dissociative experience which have potential links to phenomena found in eating disordered populations.

#### **1.1. General introduction to the thesis.**

Over the past fifteen years, and especially in the early to mid 1990s, a set of studies has emerged indicating that individuals diagnosed with bulimia nervosa or bulimic symptoms tend to express higher levels of hypnotic responsiveness than age matched controls (e.g. Pettinati, Horne, & Staats, 1985; Barabasz, 1991). These earlier studies focused exclusively on elevated hypnotizability, and researchers interpreted such findings by equating the apparent dissociative nature of binge eating episodes with that of an hypnotic ‘trance’, suggesting that similar dissociative processes may underlie binge experiences and hypnotic responsiveness. Unfortunately, these studies lacked objective measurement of dissociation so its hypothetical relationship with hypnotizability in eating disordered samples could not be directly assessed.

In contrast, more recent studies have tended to focus exclusively on dissociation, rather than hypnotizability. Studies that have examined both hypnotizability and dissociation have found significant positive correlations between the two, varying from a strong relationship in a bulimic only sample (Covino, Jimerson, Wolfe, Franko, & Frankel, 1994) to a weaker association in a sample of bulimics and anorexics (Vanderlinden, Spinhoven, Vandereycken, & van Dyck, 1995). These results partially support the hypothesis that hypnotizability and dissociation are related in these bulimic populations. Such findings, combined with a renewed interest in clinical and non-clinical investigation of hypnosis and dissociative mechanisms, have triggered a debate into the possible moderating and/or mediating roles of dissociation and hypnotizability in the formation, expression, and maintenance of particular eating disordered attitudes and behaviours.

The initial theoretical impetus for the experimental work reported later originated from the above domain of inquiry. The thesis itself incorporates an empirical examination of hypnotizability and dissociation in relation to dietary restraint and dietary disinhibition, but focuses primarily on non-clinical phenomena as such dieting concerns, cognitive control of eating, and body dissatisfaction, which may act as hypothetical risk factors for developing subsequent eating psychopathology. Within the non-clinical domain, hypnotic suggestibility and the closely related phenomenon of waking suggestibility may be particularly related to the initial internalisation of restrained eating attitudes and patterns, which in turn may be related to aspects of symptom formation in eating disorders. Dissociation, on the other hand, may be useful in interpreting features of disinhibited eating behaviours and attitudes, especially in terms of possible defence reactions to aversive cognitions (e.g. Heatherton and Baumeister, 1991). The possibility that hypnotic suggestibility and dissociation are involved in different, yet related features of eating behaviours and attitudes, provides an initial theoretical basis for adopting these frameworks to examine the different features of clinical and non-clinical patterns of eating.

### 1.1.2 Three principle theoretical perspectives.

The core strand of this thesis is an investigation of potential associations involving hypnotizability and dissociation in relation to particular non-clinical patterns of eating attitudes. The remainder of this chapter covers the majority of the principal

theoretical groundwork for this strand commencing with a detailed examination of studies within the clinical literature that have formed the basis for the work reported in this thesis. Particular emphasis is placed on issues raised in the clinical literature that are relevant to understanding the potential influences of hypnotizability, suggestibility, and dissociation in relation to dietary restraint, dietary disinhibition, and related concerns. The final sections of this chapter consider the relatively small number of studies investigating hypnotizability and dissociation in the non-clinical dietary restraint literature.

As this thesis incorporates theories and measures of eating attitudes and eating behaviours, an important secondary strand is an examination of the operationalisation of such concepts and their inter-relationships. Chapter two examines these issues and how they relate to the apparent increase in the prevalence of dieting and eating disorders in terms of social factors based upon changes in cultural body aesthetics, evolutionary approaches to dieting, adolescent development, and general models incorporating features of dietary restraint and dietary disinhibition.

An important third strand of this thesis concerns the need to have a clear understanding of what is meant by the terms hypnosis, hypnotizability, dissociation, and dissociative processes. The first sections of chapter two address these issues. Though aspects of these definitional issues reappear throughout the theoretical components of this thesis, it is important to discuss them separately as subsequent analysis of the empirical data depends on the interpretation placed on hypnotizability and dissociation measures.

With that brief overview of the theoretical chapters, the next section discusses the studies that provided the initial motivation for this thesis.

## **1.2. Hypnosis, Dissociation, and Psychopathology: Clinical and non-clinical eating patterns associated with hypnotizability and dissociation.**

Hypnosis, dissociation, and psychopathology have shared a perennial kinship. A number of clinical syndromes (e.g. phobias, post traumatic stress disorder, and dissociative identity disorder) have evidenced elevated levels of hypnotizability

compared to other clinical and non-clinical populations (for review see Groth-Marnat, 1991; Frischholz, Lipman, Braun, Sachs, 1992). Many of these clinical populations also have increased levels of dissociative experiences, suggesting a possible underlying association between hypnotizability and dissociation in these disorders. In particular, elevated levels of dissociation may be considered in some samples to facilitate the capacity to respond to certain hypnotic suggestions thereby increasing overall scores on hypnotizability scales. This potential effect matches a number of theoretical viewpoints on the nature of hypnosis and the core role of dissociation in promoting hypnotic responsiveness (e.g. Hilgard, 1977). Yet, the association between these variables may be confined to certain clinical populations.

This section examines the phenomena of hypnotizability and dissociation in relation to patterns of abnormal eating behaviours. Historical, interest in examining hypnotizability in clinical populations was based on similarities between personality characteristics related to bulimic pathology and those relating to high hypnotizability in other clinical groups (e.g. Pettinati et al, 1985; Barabasz, 1991). Personality characteristics present in clinical populations of high hypnotizables and in bulimic individuals have included the presence of phobic responses (e.g. Crisp, 1967; Russell, 1979), hysteria (e.g. Wooley & Wooley, 1985), affective disorders (e.g. Russell, 1979; Fairburn & Cooper, 1982), and dissociative experience (Russell, 1979).

A majority of the studies reviewed focus on group comparisons between clinical and non-clinical controls (mostly adopting standardised norms for the measures used) and/or on basic correlational analyses. Group comparisons serve an important function in illustrating differences between levels of hypnotizability and dissociation between target groups and controls. Correlational analyses and related multivariate procedures such as multiple regression, are more recently adopted techniques and serve a much more important function in identifying the specific nature of associations between features of eating behaviour/attitudes and aspects of hypnotizability and dissociation.



### 1.2.2. Hypnotizability in relation to clinical patterns of disordered eating.

The studies reviewed in this section are listed in table 1.1. for convenience. Means and standard deviation are also listed in relation to the groups used, with stars indicating significant differences from control groups.

Based on clinical accounts suggesting that aspects of bulimic behaviours may occur in a 'trance-like' or hypnotic state; Pettinati, Horne, and Staats (1985) examined hypnotizability in eating disordered inpatients with varying levels of diagnosed bulimic symptoms based on DSM III criteria (American Psychiatric Association: APA, 1980). The principle findings indicated that patients with bulimia (now known as bulimia nervosa) scored significantly above standardised non-clinical norms on a commonly used measure of hypnotizability (Stanford Hypnotic Susceptibility Scale: Form C, SHSS:C: Weitzenhoffer & Hilgard, 1962). Bulimia patients were also significantly more hypnotizable than both purging and non-purging anorexics, though purging anorexics did also present significantly higher hypnotizability than general population means. Categorical analysis of high hypnotizables (highs) on the SHSS:C also indicated a significant overrepresentation of highs amongst the bulimia patients compared to the combined anorexic groups. Despite indications of a trend for higher hypnotizability in individuals with bulimic tendencies, anorexics that expressed aspects of bulimic related purging behaviours were not more hypnotizable than non-purging anorexics on the SHSS:C.

Pettinati et al. did not restrict themselves to one hypnotizability measure. Differences between bulimia patients and the anorexic sub-types were corroborated on a briefer measure of hypnotizability, the Hypnotic Induction Profile (HIP: Spiegel, 1973). A third scale, the Harvard Group Scale of Hypnotic Susceptibility: Form A (HGSHS:A: Shor & Orne, 1962), a group version of the SHSS:C, mirrored the SHSS:C in terms of differences between bulimics, anorexics, and the appropriate norms. However, these differences were reported as non-significant, based on the adoption of 2-tailed probabilities, rather than the 1-tailed approach that would have perhaps related better to the original predictions. Importantly, differences in hypnotizability between diagnostic categories cannot be based purely on syndrome typology, as possible differences between diagnostic categories in terms of symptom severity and frequency were not

analysed or reported. Potential statistical artefacts relating to unequal group sizes between diagnostic categories may have also distorted the findings.

A later re-analysis of the above results by Pettinati, Kogan, Margolis, Shrier, and Wade (1989) uncovered significantly elevated pass rates on SHSS:C items associated principally with cognitive hallucinations, and a sub-set of 'challenge suggestions' based on an inability to enact a normally straightforward behaviour such as bending one's arm. These two item categories have shown strong correlations with absorption measures potentially related to aspects of dissociative capacity (e.g. Balthazard & Woody, 1992). Taken together with the original findings these analyses tend to support the original conclusions of Pettinati et al. (1985) which suggested that elevated dissociation, supposedly underlying both bulimic symptoms and hypnotizability, was responsible for elevated hypnotizability scores in bulimic groups.

As a majority of bulimics tend to be outpatients, a subsequent study by Barabasz (1991) compared hypnotizability in college student outpatients with bulimia to college students without bulimic symptoms (n=40 and n=42, respectively), again using the SHSS:C. The principle finding corroborated the significantly elevated hypnotizability in bulimics compared to the non-patient controls. Unlike Pettinati et al (1989), item analysis of the SHSS:C showed no significant differences between bulimics and non-patients in the number of dissociative-type items passed. This stands against a purely dissociative interpretation of elevated hypnotizability in bulimics, but without an external measure of dissociation this issue could not be properly addressed. All bulimics and controls were assessed on level of symptomatology and were screened using DSM III criteria, but unfortunately correlations between hypnotizability and symptom severity were not reported.

**Table 1.1.**

**Studies examining level of hypnotizability in eating disordered populations.**

Studies and Authors.	Participant Groups (n)	Hypnotizability scores (SD)		
		<i>HIP</i>	<i>HGSHS:A</i>	<i>SHSS:C</i>
Pettinati, Horne, & Staats, 1985	Bulimia (21)	7.13 (2.4)*	8.05 (2.3)	7.71 (1.7)*
	Purging Anorexics (46)	4.93 (2.4)	7.11 (2.7)	6.13 (2.6)*
	Abstaining Anorexics (19)	4.66 (3.2)	6.11 (2.7)	5.00 (2.3)
	<i>Combined Anorexic groups (65)</i>	<i>4.85 (3.2)</i>	<i>6.82 (2.7)</i>	<i>5.80 (2.5)</i>
Barabasz, 1991	Bulimia nervosa (40)	<i>SHSS:C</i>		
	Non-clinical controls (42)	9.25 (1.88)*		
Kranhold, Baumann, & Fichter, 1992	Bulimia Nervosa (15)	<i>HGSHS:A</i>		
	Non-clinical controls (15)	7.07 (3.09)*		
Griffiths & Channon-Little, 1993	Combined Bulimia nervosa (95) and partial syndrome bulimics (18).	4.47 (2.50)		
		<i>HGSHS:A</i>		
Covino, Jimerson, Wolfe, Franko, & Frankel, 1994	Bulimia nervosa (17)	7.03 (2.9)		
	Non-clinical controls (20)	<i>SHSS:C</i>		
Vanderlinden, Spinhoven, Vandereycken, & van Dyck, 1995	Bulimia nervosa (18 )	9.0 (2.2)*		
	Mixed (binge/purge) anorexics (17 )	6.0 (3.0)		
	Abstaining anorexics ( 18)	<i>SHCS</i>		
		3.40 (1.10)*		
		3.20 (1.40)*		
		2.60 (1.04)		

Note: HIP = Hypnotic Induction Profile (Spiegel, 1973), HGSHS:A = Harvard Group Scale of Hypnotic Susceptibility: Form A (Shor and Orne, 1962), SHSS:C = Stanford Hypnotic Susceptibility Scale: Form C (Wetzenhoffer & Kihlstrom, 1962), and SHCS = Stanford Hypnotic Clinical Scale (Morgan & Hilgard, 1975). \* indicates significant differences from controls.

Kranhold, Baumann, and Fichter, (1992) also found significantly greater hypnotizability in a sample of bulimic inpatients (bulimia nervosa, n = 15) compared to a non-clinical group (n = 15) sample from the same college, using the HGSHS:A. One improvement from previous studies was the use of the more recent DSM III-R diagnostic criteria (APA, 1987), which represents a more stringent and exclusive categorisation of bulimia nervosa than the earlier DSM III. In addition to higher hypnotizability, the bulimics had significantly higher pass rates than controls on two of the HGSHS:A challenge items (finger lock and communication inhibition), but no significant differences on the other items, including to so-called fly hallucination item. Kranhold et al. (1992) point out that their obtained mean for the bulimic group was only slightly higher than standard norms obtained for the particular translation of the

HGSHS:A used (Bongartz, 1985). However, closer examination of control groups used by Kranhold et al. (1992) and the original standardisation sample revealed that the original standardisation utilised mostly students who were not comparable to Kranhold et al.s' controls in terms of age and education. Given these demographic differences, Kranhold et al.s' use of relative differences between their control and clinical grouping is appropriate and informative.

The overall results of the Kranhold et al. (1992) study were in part interpreted in terms of a potential dissociation mechanism acting as a prime means of conveying hypnotic responses. Higher pass rates on challenge items may suggest a dissociation between intended behaviour and actual behaviour, a relevant feature of the concept of dissociation (Cardeña, 1994). However, no direct measure of dissociation was used to assess this hypothesis. In addition, one of the apparent dissociative items on the HGSHS:A, the fly hallucination, showed no significantly higher pass rates in bulimics compared to controls. One serious criticism of the study is that participants were not blind to the hypothesis under investigation, being told that there may be a possible connection between hypnotizability and bulimic eating behaviour. A strong context effect may have therefore biased the bulimics' responses to the hypnotizability test items, introducing a potential experimenter effect and social desirability bias.

In another study, Griffiths and Channon-Little (1993) compared hypnotizability scores from a combined eating disordered group (n=113) composed of diagnosed bulimia nervosa (n = 95) and partial syndrome patients (n = 18) with expected scale norms for the HGSHS:A. The eating disordered group demonstrated significantly greater pass rates on the harder hypnotic items. Elevated response rates for the bulimics/partial syndrome patients were found particularly for the fly hallucination item ( $p < 0.001$ ), compared to standardised norms. As the fly hallucination is viewed as a putative dissociative type item the authors suggested that these findings were based on a higher dissociative capacity in the eating disordered group, but again their study lacked an external measure of dissociation. The validity of combining partial syndrome individuals with bulimia nervosa patients was also questionable. Combining such individuals creates potential confounds of symptom severity and/or symptom type, as partial syndrome patients lack the symptom severity of bulimia nervosa, whilst exhibiting a majority of the symptoms of both anorexia and bulimia nervosa. Separate, possibly age matched, analyses of partial syndrome patients would have provided an

excellent means of assessing relationships between hypnotizability, symptom type and severity, but it was likely that the unequal sample sizes for these groups (95 partial syndrome versus 18 bulimics) prevented the authors from undertaking such a comparison.

Hypnotizability scores for bulimics similar to those found by Barabasz (1991) were revealed in a more recent study by Covino, et al. (1994), who found elevated hypnotizability in bulimics outpatients ( $n = 7$ ), using the SHSS:C, compared to a non-clinical control group ( $n = 20$ ). Non-patient controls were screened for current and/or familial history of bulimia nervosa, obesity, or major psychopathology, and hence prevented accidental inclusion of potentially eating disordered individuals into the control group. Despite the promising group differences, no significant correlations were found between hypnotizability and aspects of bulimic symptomatology such as frequency of bingeing, frequency of self-induced vomiting, symptom onset, and chronicity of illness, suggesting hypnotizability was not related to post-morbid aspects of bulimia nervosa. Covino et al (1994) also found a strong significant correlation ( $r_s = 0.61$ ) between hypnotizability and a measure of dissociative experience in bulimics, but not in controls ( $r_s = 0.30$ , ns).

On the basis of their results Covino et al. (1994) suggested that psychological factors underlying hypnotizability in bulimics might be more related to symptom acquisition, rather than symptom severity. One possible example of this symptom formation process is the distortive influence of putative hypnotic factors such as vivid imagination and reduced analytical processing, on features of self-perceived body image and eating attitudes. These distortions may be relevant to establishing an initial cycle of problematic eating, which could eventually intensify and result in bulimia nervosa. Another possible example of pre-morbid symptom formation involving aspects of hypnotizability, is the effect of heightened receptivity to suggestion, another key feature supposed to underlie hypnotizability, and its influence on the acquisition of salient motivations towards obtaining stereotypically attractive thin body ideals. Highly internalised and salient cognitive representations of these 'thin ideal' stereotypes may subsequently motivate increasingly severe types of dieting and bulimic practices (e.g. Stice, 1994), but such increase in severity would not necessarily be the result of hypnotizability *per se*.

In the final study to be reviewed in this section, Vanderlinden et al. (1995) used a different hypnotizability scale, the Stanford Hypnotic Clinical Scale (SHCS: Morgan & Hilgard, 1975), to measure hypnotizability in eating disorder patients ( $n = 53$ ) with bulimia nervosa ( $n = 18$ ) and anorexia nervosa ( $n = 35$ ). Examination of patient sub-groups showed that bulimia nervosa patients and bulimic anorexics, but not abstaining anorexics, had significantly elevated hypnotizability compared to SSHC:C population norms. Again, as with Pettinati, et al. (1985) there appeared to be a trend for higher hypnotizability in-patients with bulimia or bulimic symptoms. However, comparisons between clinical sub-groups did not find a statistically significant trend, despite means being in the hypothesised directions. Of the studies reviewed in this section Vanderlinden et al. (1995) was the most statistically and methodologically elegant. Their study controlled for resistance to hypnosis, a negative motivational factor that may suppress scoring on hypnotizability scales and symptom severity, finding that these factors did not account for differences in hypnotizability amongst the clinical groups. However, it is also important to note that although these results appear to support previous findings, the SSHC:C is not a general measurement of hypnotizability and so care must be taken in generalising these findings to other studies.

Vanderlinden et al. (1995) also measured dissociation using the Dissociation Questionnaire (DIS-Q: Vanderlinden, Van Dyck, & Vandereycken, 1993), finding a significant, yet moderate correlation with hypnotizability ( $r = 0.35$ ), but only for the eating disordered individuals as a whole. The loss of control and identity confusion sub-scales of the DIS-Q, but not the amnesia or absorption sub-scales, also demonstrated significant, yet moderate positive correlations with hypnotizability ( $r = 0.38$  and  $r = 0.30$ , respectively), but again only for the overall eating disordered groups. Group differences in dissociation were examined, but discussion of this will be deferred to a later section that deals explicitly with dissociation.

### 1.2.3. Summary and conclusions of hypnotizability and clinical patterns of eating behaviour.

Overall, clinical studies suggest that bulimics, and at times anorexics with variants of bulimic type symptoms, demonstrate higher hypnotizability scores compared to non-clinical controls. These findings suggest some potential degree of relationship between hypnotizability and bulimic type symptoms. However, none of the studies

reviewed have found a statistically significant trend for increasing hypnotizability in relation to increasing bulimic symptoms. In addition, measures of bulimic symptoms have failed to correlate with hypnotizability. The question remains that if hypnotizability is not related to features of symptom severity, then why do eating disordered individuals show greater levels of the phenomenon.

Level of hypnotizability has been repeatedly interpreted as a potential indicator of the extent to which suggestive influences may impinge upon an individual. A number of studies support the socially orientated nature of bulimic pathology (e.g. Striegel-Moore, Silberstein, & Rodin, 1993), suggesting that bulimics express a heightened concern with achieving and maintaining a socially acceptable image. With the increasing socio-cultural emphasis on a thin or slim body as a stereotype of sexual attractiveness and femininity in women (e.g. Stice, 1994) achieving a desirable body aesthetic may become one perceived means of obtaining an acceptable social image. The extent to which an individual incorporates these social stereotypes of idealised body image into their own representational system may be paramount in motivating behaviours such as dieting, which may act as risk factors for the development of eating difficulties. Hypnosis, as a suggestive process, whether it is dissociative or not in nature, may act as an index of receptivity to social suggestion and this may provide a framework for interpreting the elevated hypnotizability found in bulimics. In this sense hypnotizability could be seen to operate on pre-morbid aspects of bulimia, and potentially also on the formation of dietary restraint concerns and/or behaviours.

Early hypotheses suggested that episodes of bulimic behaviours and hypnotic experience may have common dissociative substrata (Pettinati, et al., 1985), and analyses of individual hypnotic items have generally supported this view, despite some lack of corroboration (e.g. Barabasz, 1991; Kranhold, et al, 1992). Dissociation may play a possible role in facilitating hypnotic responsiveness and such a role may also be related to features of bulimic behaviours. A basic assumption about dissociation is that it represents a splitting or separating off of psychological and/or behavioural mechanisms, especially disengagement of cognitive mechanisms related to critical judgement of behaviours. This conception of dissociation fits well with the experience of certain bulimic behaviours as seemingly uncontrolled.

Dissociation may also act as a facilitator of responsiveness to suggestions, including social messages concerning motivations to diet and lose weight that may become accentuated and eventually lead to bulimic behaviours. Schumaker (1992a) proposes a theory of the adaptive role of dissociation in non-critical or non-censored responding to suggestions, emphasising the way dissociation may help in bypassing or suppressing critical type awareness and cognitive regulation of action and behaviour and allowing individuals to react to suggestion without the need of detailed conscious decision making. Similarly, Woody and Bowers (1994) base their theory of hypnotizability on just such a suppression of critical higher level processes which allows suggestive content to interact directly with existing behavioural and mental schemata leading to facilitation of automatic suggestive responding.

Some contemporary hypnosis researchers such as Carlson and Putnam (1994) and Barrett (1992), have suggested that highly hypnotizable individuals may be divided into dissociative and non-dissociative sub-groups. The extent to which bulimia expresses these two potential routes to elevated hypnotizability may be one means of examining the issues raised above. However, simply passing dissociative-*type* items is also only face valid support that hypnotizability is elevated as a result of dissociation. Actual correlations between hypnotizability and dissociation have varied from fairly low (Vanderlinden et al., 1995) to fairly high (e.g. Covino, et al., 1994), with significant correlations being found only in clinical groups, suggesting that though dissociation may be in part related to hypnotizability, this relation may be variable and selective.

As a last comment on this section, it is important to recognise that elevated suggestibility may be indicative of a heightened predisposition towards experimental biases related to social desirability and similar phenomena. Socially desirable responding cannot be ruled out as an alternative hypothesis regarding elevated levels of hypnotizability in bulimics. Measures of social desirability would be one means of exploring the possibility that if hypnotic responding is mediated by social desirability components.

In addition to examining hypnotizability, the question still remains as to the relationship between dissociation, or types of dissociation, and bulimic behaviours. As suggested above simply examining hypnotizability is not sufficient to determine the



answer to this question. Examination of dissociation directly in relation to clinical groups may provide answers. The next section reviews such studies.

#### 1.2.4. Dissociation and clinical patterns of disordered eating.

Dissociation is by no means a recent concept. In its first incarnation (Janet, 1889) it was defined as a pathological fragmentation of a normally unified personality, leading to automatic behaviours performed outside conscious control ('psychological automatisms'). Janet proposed that normally integrated personality components could become disintegrated as result of weakened neuro-physiology, brought on principally by antecedent traumatic experience. The disintegrated or dissociated components were postulated to underlie hysterical phenomena, with hypnosis being a prime example of hysterical dissociation.

At the time Janet's theory was generally overlooked in favour of Freud's conception of repression, subsequently faring little better during the behaviourist era. Recently a strong revival of interest in dissociation has occurred, especially in clinical theory where the concept of separated or split-off aspects of self, thoughts, affect, and behaviour, has led to the separate category of dissociative disorders (e.g. Nemiah, 1989). Dissociation has increasingly become a topic of interest in the eating disorders, especially as an explanatory framework in relation to bulimia nervosa and bulimic symptoms (e.g. Waller, 1995). Evidence for dissociative features specific to bulimic pathology emerges from two principle sources: 1) client reports taken during therapy or clinical observation; and, 2) the use of self-report measures said to measure levels of dissociative experiences.

##### 1.2.4.1 Subjective reports of dissociative states in bulimics and bulimia nervosa.

Dissociative type phenomena such as loss of control, involuntariness of behaviour, timelessness (separation from ongoing reality), numbing (separation from sensation), and amnesia have all been reported as subjectively associated with binge behaviour (e.g. Russell, 1979; Torem 1986; Chandarana & Malla, 1989). Such reports suggest a degree of separation of thought and/or action from perceptions of the world and self, and are prima facie evidence at least for dissociative process manifesting along with the binge experience itself. Some bulimics have also remarked on prolonged

dissociative episodes, such as depersonalisation or ‘hysterical’ type symptoms (Russell 1979; Abraham & Beaumont 1982; McCallum, Lock, Kulla, Rorty, & Wetzel 1992), trance-like states, out-of-body-experiences, multiple personalities, and general dissociative avoidance of reality (Waller, 1995).

Abraham and Beaumont (1982) were amongst the earliest researchers to report dissociative phenomena manifesting within bulimic syndromes, principally episodes of de-realisation and depersonalisation appearing in a sub-type of bulimics practicing regular self-induced vomiting. Torem (1986) also described marked dissociative experiences in two patients with bulimia nervosa (DSM III criteria) including ‘trance-like’ depersonalisation and loss of agency during bingeing episodes. Other reported dissociative experiences included reduced recall of events occurring during binge eating, spontaneous ‘trance-like’ age regression linked to escape from early abuse, and distinct feelings of separate personalities influencing internal thoughts and behaviours. Chandarana and Malla (1989), have also referred to the appearance of multiple good and bad personalities, up to five in total, linked with increased bulimic severity in one patient.

Torem (1986) interpreted dissociated personality components, or ego states, as punishing patient’s achievement of independence and personal success by triggering unwanted binge/purge episodes. In one case reported by Torem (1986), it appeared that dissociated experiences of abuse related childhood eating behaviours, such as bingeing after abusive starvation and vomiting precipitated by forced feeding of rotten food, would spontaneously re-emerge during adulthood as binge/purge cycles. Dissociative mechanisms appear to be initially adaptive defences, such as an amnesiac defence against abuse that allowed one of Torem’s (1986) patients to continue everyday childhood activity, but later in life such defences can become maladaptive. These theoretical interpretations are pre-dominantly rooted in a Janet-like perspective where separation of personality or ego components, acting initially as an adaptive defence against trauma, from either covert self-punishment instincts, or act as templates for a regression to trauma related behaviours. Failure to resolve childhood traumata (e.g. Spiegel, 1986) turns the initial adaptive value of dissociative defence into a perpetuated maladaptive phenomenon.

#### 1.2.4.2. Self-report studies of dissociation in eating disordered samples

Though the prevalence of face valid dissociative phenomena in bulimic-type patients is a promising start in characterising a putative relationship between bulimia nervosa and dissociative processing, more standardised methodology can reveal further quantifiable evidence. Factor analytical studies of dissociation scales have yielded a number of potential distinct types of dissociation. Standardised self-report measures of dissociation can therefore help extend the anecdotal evidence gathered in the clinical context by identifying the levels and types of dissociative experiences related to various aspects of eating disorder symptoms. It should be emphasised that the studies reviewed below examine group-based differences and/or are correlational in nature and therefore cannot be used to make direct causal inferences. However, such studies can identify issues of importance and inform experimental studies which are designed to tease apart causal interactions.

The earliest self-report study involving measures of dissociation was conducted by Demitrak, Putnam, Brewerton, Brandt, and Gold (1990) and compared dissociation as measured by the Dissociative Experiences Scale (DES: Bernstein and Putnam, 1986) in non-bulimic age-matched experimental controls ( $n = 30$ ) and a combined sample of anorexic ( $n = 12$ ) bulimia nervosa inpatients ( $n = 18$ ). The combined eating disordered group indicated significantly higher levels of total dissociative experience (based on median values) and higher scores on sub-scales of the DES measuring amnesia, depersonalisation, and absorption, compared to non-patients. Anorexics reported significantly more total dissociative experiences than bulimics, though bulimics still reported significantly more of these experiences than controls. Further examination of the data based on group data plots (Demitrak et al., 1990: p 1186) suggest potential clusters of low to moderate and high anorexic dissociaters, but as potential sub-types of anorexia were not categorised it is unclear if dissociative differences related to different aspects of the syndrome. There were no significant differences between anorexics and controls, or bulimics and controls on the DES sub-scales (amnesia, depersonalisation, and absorption). Dissociation did not correlate with aspects of symptom severity, onset, chronicity, or type, though patients with DES scores of 30+, a potential threshold for vulnerability to dissociative pathology (e.g. Bernstein & Putnam, 1986), showed increased attempted suicide and self-harm behaviours than those below threshold.

These initial findings suggest that, like hypnotizability, dissociation is elevated in particular eating disordered groups, but does not relate to syndrome features. However, Demitrak et al (1990) interpreted the group differences as initial corroboration for dissociative phenomena playing a role in eating pathology, supposedly acting as a psychobiological defence against abuse commonly assumed to occur in these clinical groups. Cues relating to nutritional deficiencies in these disorders were also postulated as facilitating entry into dissociative states that in turn possibly perpetuates dissociative aspects of the pathology.

However, in addition to lack of correlations with symptom features, it is uncertain whether even *elevated* dissociation is a feature of such disorders. Inspection of median dissociation scores within Demitrak et al.'s (1990) clinical groups does not suggest marked deviation from expected age related norms based on a large standardisation study conducted by Ross, Joshi, & Currie (1990, normative median standard of 15.2), whilst the control groups scores fall far below expected values. Hence, differences between the clinical and control groups may have resulted from low non-patient scores, rather than elevated clinical scores. In contrast, a recent review of DES scores across clinical and non-clinical samples (Carlson & Putnam, 1993) indicated lower DES scores than suggested by norms, with medians ranging from 4.4 to 6.4, and means ranging from 3.7 to 7.8. It is uncertain, therefore, whether large-scale norm studies have failed to represent the lower level of dissociation in the general population, despite their large sample size, or whether smaller experimental samples of non-patient controls using different types of participants, create the lower control scores. Anorexics in Demitrak et al.'s study did somewhat exceed the expected norms, but only marginally, yet as already mentioned the extent to which these anorexics represented a homogenous diagnostic group is uncertain.

Goldner, Corkhill, Bakan, Birmingham, (1991) found very similar result to Demitrak et al. (1990), with an eating disordered group (25 participants, unspecified diagnoses) scoring significantly higher on the DES than an age matched control group (25 participants). The eating disorder group also reported higher incidences of self-harm behaviours. Goldner et al. (1991) were also interested in the reported incidence of sexual abuse and found that the eating disordered group reported significantly higher incidence of severe forms of childhood sexual abuse (oral intercourse and/or genital intercourse) compared to controls. These findings fit in with dissociation acting as a

defence against early abuse that subsequently puts individuals at risk of potential dissociative pathology, which may be expressed in part through disordered eating (e.g. Torem, 1986). However, in their brief article, Goldner et al. do not specify the composition of their eating disordered group. So comparison between different diagnostic types cannot be discussed, though in reply to Goldner et al.'s (1991) article Demitrak, Putnam, Folsom, and Krahn (1991) indicate the relevance of early abuse experiences as a feature that 'cuts across established diagnostic boundaries' leading to potential dissociative phenomena. The extent to which early trauma leads to dissociative experiences is theoretically supported, but clearly such studies as those cited above cannot fully examine this issue without longitudinal data that are very difficult to obtain.

McCallum, Lock, Rorty, and Wetzel (1992) presented a detailed, multi-variable examination of dissociative characteristics in a sample of 20 eating disordered inpatients and 18 outpatients. Symptomatic histories within the combined samples included bulimia nervosa (71%), anorexia (21%), and EDNOS (eating disorder not otherwise specified, 8%). Unfortunately, inpatient and outpatients groups were not distinguished for analysis neither were diagnostic categories. The median level of dissociation in the overall sample, based on DES total and sub-scale scores, was considered to be higher than expected for non-patients, yet no inferential statistics were conducted of this potential difference as the study was more concerned with patterns of dissociative experience than comparisons with norms. However, in 74% of patients aspects of restricted food intake, bingeing, and purging behaviours or rituals were temporally related to particular dissociative experiences such as staring into space unaware of time passing (absorption), passive listening without recall, realistic daydreaming, talking to oneself, and hearing voices. This potential temporal relationship may help elucidate the way dissociative processes relate to specific forms of eating symptomatology, especially a link between dissociation and the rituals associated with binge, purging, and restrictive practices. However, dissociation in these eating disordered groups may have been related to physiological factors such as mal-nourishment, rather than psychological mechanisms per se.

Table 1.2.

Studies examining level of dissociation in eating disordered individuals.

Authors	Participants (n)	Dissociation Measures
Demitrak, Putnam, Breweton, Brandt, & Gold, 1990	<b>Anorexia Nervosa (12)</b> <b>Bulimia (18)</b> <b>Combined clinical sample (30)</b> Matched Controls (30)	<u>DES (medians)</u> <b>19.5*</b> <b>16.6*</b> <b>16.7*</b> 6.4
Goldner, Cockhill, Bakan, Birmingham, 1991	<b>Unspecified eating disorder group (25)</b> Age matched non-clinical controls (25)	<u>DES (Mean)</u> <b>17.8*</b> 3.7
McCallum, Lock, Kulla, Rorty, & Wetzal, 1992	<b>Anorexia and Bulimia nervosa symptoms (38)</b> <b>-with dissociative co-morbidity</b> <b>-without dissociative co-morbidity</b> (no non-clinical comparisons made)	<u>DES (median/mean)</u> <b>11.6 / 15.43 (SD 13.7)</b> <b>18.32 / 24.33 (SD 20.12)</b> <b>10.89 / 11.80 (SD 8.02)</b>
Covino et al, 1994	<b>Bulimics (17)</b> non-clinical controls (20)	<u>DES (means)</u> <b>16.1 (SD 14.6)*</b> 6.9 (SD 4.8)
Everill, Waller, & Macdonald, 1994	<b>Combined Eating disordered group (26) of</b> <b>Bulimic anorexics (4), anorexic history bulimics (9),</b> <b>Bulimia Nervosa (13):</b> Non-clinical controls (100):	<u>DES (means)</u> <b>17.1 (SD 14.24)*</b> 12.8 (SD 9.67)
Vanderlinden et al, 1995	<b>Mixed eating disordered group</b> <b>[anorexia nervosa (18), Bulimic Anorexics (17), Bulimia</b> <b>Nervosa (18)].</b> Standardised normal scores:	<u>DIS-Q (means)</u> <b>2.3 (SD 0.5)*</b> 1.5 (SD 0.3)
McManus, 1995	<b>Bulimia Nervosa university students (18):</b> Control university students (18):	<u>DES (Means)</u> <b>16.4 (SD 9.42)*</b> 6.77 (SD 4.46)
Favaro & Santonastaso, 1995	<b>Combined anorexic (3), Bulimia Nervosa (3), and partial</b> <b>symptoms (24) group (total n = 30):</b> Non-clinical controls (79):	<u>DIS-Q (means)</u> <b>2.22 (SD 0.52)</b> 2.05 (SD 0.42)
Dalle Grave, Rigamonti, Todisco, Oliosi, 1996	<b>Combined group of anorexics (30), bulimic anorexics</b> <b>(12), Bulimia nervosa (17), Binge eating disorder (30),</b> <b>Obesity (14):</b> Non-clinical controls (112):	<u>DIS-Q (means)</u> <b>2.2 (0.8)*</b> 1.9 (0.5)

Note: **Eating disordered groups and their group statistics are in bold.** DES corresponds to the Dissociative Experiences Scale (Bernstein & Putnam, 1986), considered by many researchers as the gold standard of dissociation scales. The DIS-Q, corresponds to the Dissociation Questionnaire (Vanderlinden, Van Dyck, Vandereycken, & Vertommen, 1993) a validated Dutch dissociation scale. \* indicates significant differences from non-clinical controls, but only for within the study, unless use of standardised norms are specifically reported.

McCallum, et al. (1992) also assessed syndrome co-morbidity, particularly dissociative co-morbidities (e.g. multiple personality disorder, depersonalisation disorder, and psychogenic amnesia). This important, and previously unassessed methodological feature, can help determine the extent which manifest dissociative elements are related to a principle diagnosis of eating disorder, rather than originating from an underlying co-morbid disorder. Patients with co-morbid dissociative disorders scored significantly higher than those without dissociative syndromes, on the absorption and de-realisation sub-scales of the DES, but scores on the total DES were not significantly different between dissociative and non-dissociative co-morbid groups. Therefore, though underlying dissociative disorder may elevate particular types of dissociative experience, it may not be responsible for all the dissociative experiences

present within eating disordered groups. As a high proportion of non-dissociative syndrome patients reported dissociative symptoms associated with eating disordered symptoms (70%), it is likely that a specific, possibly unique, association with eating symptomatology is occurring within the eating syndromes examined.

In another study Covino et al. (1994) found significantly higher DES scores in their bulimia group (n=17) compared to age matched controls (n=20). DES sub-scales scores were not reported. Mean level of dissociation for the eating disordered group and non-patient controls were very similar to medians found by Demitrak et al (1990). However, as with Demitrak et al. (1990), such differences may have been due to extremely low responding from the non-patients, rather than elevated dissociation in the bulimia patients. A most important finding was the lack of significant correlations between dissociation and variables relating to symptom severity such as binge frequency, level of self-induced vomiting, and illness duration, making it unlikely that dissociation is an underlying factor in these features. The investigators suggested that dissociative experiences in eating disordered groups might be the consequences of nutritional deficiencies, as suggested for McCallum et al. (1992), rather than indicators of defence processes related to symptomatology. This approach formulates dissociation as a consequence of physiological processes related to under nourishment, rather than a psychological defence process.

A more recent study by Everill, Waller, and MacDonald (1995) used the DES II, a newly developed version of the DES (Carlson & Putnam, 1993), to examine differences in dissociative experiences between a college based non-patient sample (n=100) and a clinical eating disordered sample (4 anorexic bulimics, and 13 bulimia patients with a history of anorexia, and 9 bulimics without anorexic histories). Unfortunately, the clinical sub-groupings were not distinguished in the following analyses, possibly due to small group sizes, so diagnosis specific differences could not be ascertained. The clinical group scored marginally, yet significantly, higher than non-patients did on the total DES II, with significant differences on the absorption, and the de-personalisation sub-scales of the DES II. No differences were found on the amnesia sub-scale of the DES II. Given the large disparity between non-patients and patient group sizes, a potential distortion of the results is possible, with possible overrepresentation of non-clinical data leading to only marginal differences between patient and non-patient groups.

In correlational analyses, Everill et al. (1995) found binge frequency was significantly related to multiple aspects of dissociation in the eating disordered group (amnesia,  $r = 0.55$ ; absorption  $r = 0.64$ ; and de-personalisation  $r = 0.50$ ) as well as with the overall DES II scores ( $r = 0.59$ ). In a regression analysis, dissociation sub-scales accounted for a substantial amount of binge frequency variance (39%), but the only significant contributing predictor was the absorption sub-scale. The strong correlations and the high predictive power of absorption for bingeing frequency suggest an important relationship not found in previous studies. The authors offered multiple interpretations of this relationship. For example, both dissociation and bingeing may be concomitant, yet independent defences against psychological stress. Alternatively, redirection of attention through dissociative processes may help reduce unpleasant stimulation relating to a preceding binge episode. Conversely, the putative defence role of dissociation may lead to extreme feelings of depersonalisation or numbness for which bingeing may act as a method of reasserting general self-awareness through physical stimulation. However, as de-personalisation is elevated in-patients with co-morbid dissociative disorders, such relationships must be examined carefully to tease out the symptomatic determinants of dissociative processes. As previous studies have failed to find relationships between bulimic symptomatology and dissociation (e.g. Demitrak et al., 1990; Covino et al., 1994), these findings may require further replication.

In another study, McManus (1995) found higher dissociation scores on the total DES II and its sub-scales, in a combined group of university student patients with bulimia nervosa and bulimic anorexia ( $n=18$ ), compared to student non-patients ( $n=18$ ). The mean level of dissociation on the overall DES II again came close to levels reported for bulimics in previous group studies, with controls again expressing low levels of dissociation. Correlational analyses using the overall bulimic group found significant moderate correlations between the de-personalisation factor of the DES II and an overall measure of eating disordered attitudes ( $r = 0.43$ ). As de-personalisation appears related to potential dissociative co-morbidity (McCallum et al, 1992), the extent to which this association is unique to eating pathology must be taken with caution. Bulimic and oral control (restraint) tendencies were also significantly correlated with dissociation ( $r = 0.44$  and  $r = 0.42$ , respectively). However, binge frequency was correlated with the amnesia sub-scale of the DES, rather than absorption as found previously (Everill et al, 1995).



McManus (1995) suggested that aspects of bulimic symptoms and aspects of dissociation are not monolithic phenomena, but interact along different dimension underlying each construct. McManus interprets a principle functional interaction of dissociation as a defensive avoidance of self-focus or reflection. The relationship between bingeing and amnesia was interpreted as a potential consequence of binge eating which putatively reduces encoding/awareness of non-food relevant cognitions, leading to amnesia experiences. However, an alternative approach can be made based on Everill et al.'s (1995) suggestions in which dissociative amnesia defends from unpleasant experiences during the binge and potential negative self-image after bingeing. Though causal analyses are precluded by correlational techniques, the lack of association between bingeing and de-personalisation implies that bingeing does not play a stimulating role for recovery from severe dissociative episodes (Everill et al, 1995).

Vanderlinden et al. (1995) uncovered differences in dissociation between their eating disordered group (consisting as already detailed previously of restricting anorexics, anorexics with bulimic symptoms, and pure bulimics) and standardised norms for the Dissociation Questionnaire (DIS-Q). The overall eating disordered group was significantly more dissociative than non-clinical controls on the overall DIS-Q total and on DIS-Q sub-scales related to identity confusion, loss of control, amnesia, and absorption. There was partial descriptive evidence for increasing dissociation in relation to increasing bingeing symptomatology, although only a non-significant tendency towards higher overall levels of dissociation was suggested for bulimics and mixed anorexics compared to restricting anorexics. The only significant differences within the eating disordered groups were for lower loss-of-control type dissociation in restricting anorexics compared to both mixed anorexics and bulimia nervosa patients. This study had certain methodological and statistical advantages including statistical control of symptom severity and correction for type I errors, using Multivariate Analysis of Variance (MANOVA) as a base test, followed up by univariate Analysis of Variance (ANOVA). As norms were used, issues relating to comparisons with the general population were by-passed, but relying solely on norms has shown to be problematic as seen in previous studies in relation to experimental specific control means. Vanderlinden et al. follow the general trend of interpreting dissociation as a defence process potentially related to the expression of binge eating, which may have developed in sub-groups of eating disordered individuals as a defence against early trauma.

Favoro and Santonastaso (1995) conducted a study that did not find higher dissociative experiences, based on the DIS-Q, in an eating disorder group (3 restricting anorexics, 3 with bulimia nervosa, and 24 partial syndrome) taken from a large sample screening of college students ( $n = 491$ ). However, the large discrepancy between sample sizes for the clinical ( $n = 29$ ) and non-clinical ( $n = 491$ ) groups may have contributed to a lack of significance. A principle aim of the study was to examine the effects of previous abuse and trauma on dissociation scores for the clinical and non-clinical groups. Overall, dissociation was higher for previously traumatised and previously abused individuals, with abuse victims reporting significantly higher scores on the identity, loss of control, and amnesia DIS-Q sub-scales. Within the eating disordered group abused individuals ( $n = 5$ ) scored significantly, yet marginally, higher than non-abused participants ( $n = 24$ ) on the loss of control DIS-Q sub-scale ( $p = 0.04$ ). Non-clinical abused individuals demonstrated significantly higher total DIS-Q and loss of control scores compared to non-abused participants with a marginal result indicating elevated identity confusion.

Dalle Grave, Rigamonti, Todisco, Oliosi (1996) similarly used the DIS-Q finding significantly higher total and sub-scale dissociation in a group of eating disordered patients (30 restricting anorexics, 12 bulimic anorexics, 30 binge eating disorder, and 14 obese individuals DSM III-R) compared to 112 non-clinical college student controls. Within the clinical group, bulimics scored the highest on the overall DIS-Q, and significantly more than obese and binge eating disorder patients, but not significantly higher than the anorexic sub-types. In terms of identity confusion, restricting bulimics, anorexics, and mixed anorexics, showed significantly higher dissociation than obese and binge eaters. Bulimics scored the highest on the loss of control sub-scale, though not significantly higher than the other groups, except for binge eaters. Anorexics of both restricting and bulimic sub-types scored marginally highest on the absorption sub-scale, but were only significantly higher than obese participants, and, in the case of restricting anorexics only, binge eaters. Individuals with bulimic symptoms (bulimia nervosa, mixed anorexia, and binge eaters) also tended to report higher percentages of previous abuse. In general, bulimics tended to have higher dissociation scores, with restricting anorexics scoring lower than bulimics and mixed anorexics, whilst obese and binge eaters scored the lowest, but no all differences achieved statistical significance and Type I error corrections were not employed. These

results suggest different patterns of association determined by varying types of eating and dissociative types, supporting the dimensional perspective adopted by researchers such as McManus (1995).

Dalle Grave et al (1996) also examined the prevalence of trauma experiences in their experimental groups. Traumatized (abuse and trauma) clinical individuals had higher levels of general dissociation, loss of control, and amnesia than non-traumatized clinical individuals. Severely dissociative clinical individuals sampled by employing a cut off on the DIS-Q of 2.9 (Vanderlinden et al., 1993), had a 60% incidence of previous traumatic experiences. The overall findings were interpreted as supporting increased dissociation accompanying bulimic type pathology, with the implication that trauma is a prevalent and potentially related factor in those groups. It is important to note that binge eaters did not tend to follow the trend for increased dissociation, and this may be due to alternate use of non-dissociative defence mechanisms centred perhaps on the binge itself, which does not appear to have concomitant dissociative experiences. Binge eaters also appear to have less traumatic history. From these results it can be hypothesised that whilst dissociation as a defence is closely related to trauma it may have little to do symptomatically with bingeing itself, but this finding needs to be replicated and is in contrast with associations found in previous studies. Unfortunately, correlations between level of symptom severity, dissociation, and trauma were not reported, so it is difficult to tease out any complex interactions possibly occurring here.

1.2.5. The nature of dissociation in eating disordered individuals: Issues of methodological heterogeneity and theoretical links with defence and escape.

Only one study reviewed in the previous section failed to find significant higher dissociation in the clinical groups compared to controls, and this may have been due to the effects within the small clinical group being swamped out by the much larger control group (Favara & Santonastaso, 1995). Most researchers have also found significantly higher dissociation scores on the amnesiac, absorption, and depersonalisation sub-scales of measures (Demitrak, et al, 1990; McManus, 1995) for clinical groups compared to controls, with the exception of Everill et al. (1995) who did not find significant differences for amnesia. Other researchers using different scales have found significantly higher dissociation for loss of control and identity confusion

sub-scales (Vanderlinden, et al. 1995; Dalle Grave, 1996). Overall, these findings are indicative of higher overall dissociation in eating disordered groups.

Though some studies have used a variety of eating disorder syndromes to form their clinical group, only a few studies, in fact four of those reviewed above, have examined differences between controls, specific diagnostic categories, and within diagnostic types. A common methodological strategy appears to be to combine bulimia nervosa patients with bulimic sub-type of anorexia, potentially muddying the diagnostic differences (e.g. Everill, et al, 1995; McManus, 1995). Some studies that have discriminated amongst diagnostic categories have found that individuals with bulimia nervosa have significantly higher total dissociation than controls (e.g. Demitrak, et al, 1990; Covino et al., 1994), though not all studies support this (Vanderlinden, et al., 1995; Dalle Grave, et al., 1996). Anorexics have shown significantly higher overall dissociation in one study compared to controls and bulimics (Demitrak, 1990), but again this finding has not been replicated (e.g. Vanderlinden, et al, 1995; Dalle Grave, et al, 1996). In terms of specific features of dissociation, loss of control experiences appear to be higher in bulimia nervosa and mixed (bulimic-sub-type) anorexics compared to controls in one study (DIS-Q; Vanderlinden, et al. 1995), but other similar studies have not corroborated such findings (e.g. Dalle Grave, et al., 1996). De-personalisation type experiences appear to be potentially related to a co-morbid diagnosis of dissociative disorder (McCallum et al, 1992).

The most robust result to emerge is that eating disordered individuals considered together, despite heterogeneity, have higher dissociation than controls. Examination of sub-classifications gives mixed results for total and sub-types of dissociation. It should be mentioned that few studies adopted rigorous examination of data characteristics (e.g. testing for assumptions of variance homogeneity, general distribution characteristics, and subsequent transformations) that may have improved the possibility of significant results, though in fairness parametric tests are fairly robust in the face of distribution violations. However, even the significant results must be taken with caution, as the analyses used do not tend to account for potential increase of type I errors through use of multiple testing. Studies such as Demitrak et al. (1990) and Covino et al. (1992) have generally avoided serious statistical difficulties by adopting fewer tests, and hence lower chances of Type I errors, and using non-parametric statistics which are more applicable in cases of serious violations of assumptions and distribution based problems.

In general there are difficulties interpreting the fairly robust differences found between eating disordered individuals and non-patient controls, as the level of obtained dissociation, although significantly different from control means, is not markedly different from reported scale norms. In particular, studies using the DES and DES II do not demonstrate elevated dissociation scores in comparison to general population averages. As mentioned above, it is uncertain whether the failure to find significantly elevated DES scores is a result of issues related to the norms studies, or that the pseudo-experimental paradigm is lowering control scores resulting in the significant differences. One potential explanation is the use of student samples in some studies, which may elicit lower non-patient dissociation than that found in the wider population. This still implies that dissociation in the clinical groups is not significantly elevated. Two studies using the DIS-Q, have provided evidence from a norm perspective that overall dissociation scores are significantly elevated in eating disordered individuals based on DIS-Q, though as noted previously the differences are not significant when broken down between clinical sub-groups (Dalle Grave, et al, 1996; Vanderlinden et al, 1995). Potentially, it is the use of dissociation in different groups rather than the specific level that is relevant.

One means of exploring dissociation scores is by examining cut-off points on dissociation scales that indicate a potential or vulnerability for dissociative 'pathology'. The term 'pathology' is placed here in quotes as higher levels of dissociation do not necessarily indicate a pathological syndrome, but may indicate the elevated influence of dissociation on related pathological behaviours. The threshold for potential pathological dissociation has been cited by some authors at 15 to 20 using the DES (e.g. Ross, Heber, Norton, Anderson, Anderson, & Barchet, 1989; Steinberg, Rounsaville, & Cicchetti, 1990; Ross, Joshi, & Currie, 1991, Ross, Ryan, Voight, & Eide, 1991), whereas other researchers using larger sample sizes and advanced multivariate statistics cite the threshold at 30 (e.g. Carlson, Putnam, Ross, Torem, Coons, Dill, Lowenstein, & Braun, 1993). Depending on what criterion is chosen for cut-off, either a majority or none of the studies give clinical levels of dissociation above the 'pathological' threshold.

Correlational analyses of dissociation scores have helped, in part, to establish possible networks of relationships between dissociation and types of symptoms. Initial

findings were negative, failing to find any significant correlations between total dissociation and symptom severity, and type (e.g. binge frequency  $r_s = -0.18$ ,  $p > 0.05$ : Covino et al, 1994). Yet a similar study found strong to moderate correlations ( $r = 0.59$ ,  $p < 0.001$ ) between binge frequency and total dissociation (Everill et al., 1995), principally supported by variance in the absorption sub-factor of the DES II. McManus (1995), who used a combined clinical group of bulimia nervosa, and bulimic anorexics, found significant correlations between binge frequency and amnesia, and between the depersonalisation factor in relation to overall eating disordered attitudes, bulimic attitudes, and oral control (restraint) attitudes. However, as mentioned previously multiple testing may elevate Type I errors. As most of these McManus's (1995) correlations were already at the  $p < 0.05$  level it is uncertain that they would hold up to correction, though as the most significant correlation was between amnesia and bingeing, this would probably be retained after correction. So again binge frequency correlates with an aspect of dissociation, but in this case amnesia instead of absorption.

In conclusion, even though it is clear that further research is required and more rigid statistical testing may be applicable some relevant findings have emerged that generated plausible hypotheses. Researchers have made a variety of suggestions as to the role of dissociation in eating difficulties. Though problems relating to the definition of dissociation are relevant here, these have already been briefly covered in previous sections relation to hypnosis, and will be covered in more detail in chapter two.

#### 1.2.5.2. Theoretical models of dissociation in clinically disordered eating behaviour.

Dissociation has been generally considered as a defence mechanism tied to either a traumatic/abuse history, and/or to some potentially related attempt to escape from aversive self-perceptions or realisations. However, the means by which dissociation is involved in defence, if at all, is important. Neo-Janet viewpoints focus on the literal separation of mental contents from self-awareness and self-access, effectively compartmentalising thoughts or feelings away from conscious integration and hence self-awareness. Though a good descriptive position there is a lack of mechanistic interpretation for these dissociated experiences, and especially how such processes relate to symptomatology. It remains unclear whether dissociation represents a primary defence mechanism, or if it acts in conjunction or separately from concomitant defences, or whether it is itself an aversive experience to be defended against using

some form of severe stimulation such as bingeing or self-harm. Correlations between bingeing, absorption, and amnesia support many of these hypotheses simultaneously.

A few of the studies reviewed have provided evidence that, overall, loss of control and amnesia dissociation are significantly higher in individuals with previous abuse and trauma histories compared to non-trauma individuals using the DIS-Q (Dalle Grave, et al., 1996; Favaro & Santonasto, 1995). Significantly higher identity confusion dissociation was also found in traumatised individuals with incest and sexual abuse histories compared to physical abuse alone (Favaro & Santonasto, 1995). These findings match initial anecdotal accounts from case histories suggesting a defence role for dissociation in abused individuals (e.g. Torem, 1986). Care must be taken over comorbidity, especially with overlaps in the dissociative disorders which may better account for trauma related incidents than eating disordered symptomatology. The nature and extent of abuse may also be key characteristics, as may be the presence of other defence or coping strategies or support systems. Multivariate studies examining the complex interactions between dissociation, symptomatology, and defence styles are needed, but the theoretical basis for dissociative defence is gaining credence.

Escape from self-awareness (Heatherton & Baumeister, 1991) has been implicated in relation to the defence status of dissociation and this concept will form an important theoretical foundation in the rest of this thesis, as both dissociative absorption away from a negative self-realisation, and amnesiac processes are potential forms of escape defence. Heatherton and Baumeister's (1991) Escape Hypothesis can be seen as based on an attention process, or more accurately a dis-attending procedure. In order to avoid conceptual involvement or extended recognition of an aversive self-realisation, attentional escape can establish a shifting to a lower level of cognitive awareness or meaning (Vallacher & Wegner, 1985), where focus is taken away from conceptual or abstract considerations and relocated on basic somatic perceptions. Although not explicitly stated in the Escape Hypothesis, such a dis-attentional shift covers similar conceptual ground with the concept of dissociative separation of psychological process, and this similarity may link dissociation as a form of achieving an escape defence against aversive experiences. A potential side effect of such a shift is reduced access to higher level processes, again similar to conceptions of dissociation (e.g. Schumaker, 1991a), involved in the interpretation of thoughts and feelings subsequently reducing inhibitory functions which generally prevent external stimuli (e.g. food) triggering

automatic, uncontrolled actions such as bingeing or overeating. In this framework, a capacity to experience dissociation may facilitate defence against aversive stimulation, but may also facilitate loss of control over certain behaviours, such as control over eating and maintenance of cognitive restraint over eating.

As suggested above, dissociation can be partially re-interpreted in relation to processes such as escape. This is in part due to potential over-extension of the term, but separations from aspects of mental processing do seem to be occurring at multiple levels. For example, there is a separation from higher levels of functioning, and also a focused separation from a negative self-thought or affect. The extent to which models of dissociation fit into this type of cognitive escape framework is important and will be discussed in detail in subsequent chapters. Suffice to say that the dissociative separation account/Escape Hypothesis is one way of understanding the potential presence of dissociation in eating disordered samples. However, dissociative experiences may also be the result of defensive numbing or anaesthetic feelings associated with binge eating and purging (Root & Fallon, 1989), which may well serve as a an eating based defence. In this framework, dissociative-like experiences are central consequences of a defensive-type eating processes, but are not necessarily the cause of these behaviours, more they are the reward or motivator for their performance. In a fashion, both dissociation and binge eating/purging serve concomitant defensive functions, with one being the means of achieving the other. This ties in well with Abraham and Beumonts' (1982) observation of dissociative states linked to vomiting sub-types of bulimic eating behaviours. A third possibility exists, which suggests that dissociation is in fact a psychological stressor as opposed to a defence, producing intense and unpleasant feelings of depersonalisation, derealisation, and numbing, against which bingeing make act as a form of breaking these feelings, in much the same way as self-mutilation may.

#### 1.2.5.3. Conclusions.

There is varying evidence for dissociative experiences occurring in a variety of eating disordered groups. Though the mean levels of dissociation appear far from extreme, the question may not be one of the magnitude of dissociation, but how various individuals utilise such a capacity. Finally, it is important to explore dissociation as a potential mediator and moderator of psycho-pathological responses, and to develop testable models of the complex interactions that are potentially present.



### **1.3. Hypnotizability and dissociation in non-clinical patterns of eating behaviours and attitudes: The central focus of the thesis.**

Thus far this chapter has focused on clinical samples of eating disordered individuals in relation to hypnotizability and dissociation. The preceding sections have helped in understanding some of the methodologies, theoretical perspectives, and problems faced when investigating hypnotizability and dissociation in relation to clinical patterns of eating. However, the main focus of this thesis is on hypnotizability and dissociation in relation to non-clinical patterns of eating behaviour.

There is increasing interest in examining non-clinical samples in search of relationships involving hypnotizability, dissociation, and patterns of eating. Rationales for such investigations have varied from examining the potential links between variations in levels of dissociation and eating disordered type features in non-patients (Rosen & Petty, 1994), to hypothetical non-patient receptivity to cultural suggestions relating to thin ideals, attractiveness stereotypes, and body shape distortions (Groth-Marnat & Schumaker, 1990; Wybraniec & Oakley, 1996; Frasquilho & Oakley, 1997). Much of this research has adopted rationales substantially based on clinical research and the prevalence of sub-clinical eating disordered features in non-patient populations. Other studies have found serendipitous correlations between dissociation and eating disordered measures in their non-patient control groups (Sanders, 1986; Everill, et al, 1995).

Hypnotizability and dissociation have been suggested by various researchers as factors relevant to particular types of clinical eating behaviour potentially influencing the formation and/or expression of specific pathologies (e.g. Covino, et al, 1994). Dissociation still holds a powerful attraction in domains of clinical research, and hypnosis often presents an effective therapeutic adjunct in various psychotherapies. It is important to note, however, that hypnotizability and dissociation are not *per se* pathological phenomena, in fact they represent prevalent and widely varying individual differences in non-clinical samples, though there is a tendency towards lower overall levels compared to some clinical samples. The aim of this thesis is in part to examine non-clinical aspects of eating behaviour, principally restrained eating or dietary restraint and concepts clustering around this phenomenon such as dietary disinhibition,

measuring associations with hypnotizability and to some extent everyday and pathological forms of dissociation.

Despite being a domain of enquiry in its own right, the examination of non-clinical restrained eating and related concepts such as dieting, body dissatisfaction, and disinhibited eating, may provide insight into potential risk factors in developing clinical eating patterns. Processes such as dissociation and hypnotizability may potentially influence the wide prevalence of non-clinical restrained eating attitudes, and such interactions may account for a respectable amount of variance in subsequent pathological manifestations. Examination of potential interactions may help identify putative associations relevant as non-clinical precursors of problematic eating problems. Extreme forms of restraint behaviour, and especially dietary restraint concerns, are clear symptoms in the diagnostic definition of eating disorders such as anorexia and bulimia nervosa. A number of clinical studies have also shown that dieting tends to precede the onset of eating disorders (e.g. Russell, 1979; Abraham & Beaumont, 1982). Non-clinical eating behaviours and attitudes relating to restraint and dieting may function as analogues, or perhaps catalysts, for clinical symptoms.

However, it can be argued that non-clinical phenomena should not be confused with clinical disorders as they may represent two qualitatively different domains, underpinned by different types of factors and mechanisms. One form of this view interprets patients as having histories that are uncommon to a majority of individuals in the general population, whether such differences are familial, physiological, or include both. It is also true that whilst dieting behaviour and restrained eating attitudes remain highly prevalent in the general population, the prevalence of eating pathology, though apparently increasing, remains rather low (e.g. see Hsu, 1990 for review). Hence, as a majority of dieting behaviours and concerns in the general population do not reach pathological levels, restraint may only help trigger eating pathology in certain individuals with other vulnerabilities. It may be likely that the level of restraint is the key feature, not the mere presence of such attitudes and behaviour. Factors that elevate the level of restraint concerns and behaviours, possibly by increasing motivation to diet or related anxiety may be the ones that act as moderators of the risk factor route.

### 1.3.2. Continuity and discontinuity between non-clinical restrained eating and clinical eating difficulties: The basis for a potential continuum?

There are some indications that eating disordered phenomena are in part related to non-clinical dieting and restraint concerns in terms of degree, but not quality. A significant number of researchers have suggested that dieting behaviours and the factors underlying motivation to diet are in part responsible for aspects of eating disorder aetiology (e.g. Polivy & Herman, 1985; Striegel-Moore, Silverstein, & Rodin, 1986; Hsu, 1990; Fairburn, Marcus, & Wilson, 1993; Lowe, Gleaves, DiSimone-Weiss, Furgueson, Gayda, Kolsky, Neal-Walden, Nelson, & McKinney, 1996), at least in respect of bulimia nervosa. These so-called continuity approaches are generally based on the position that the eating disorders are identifiable along a continuum with normative dieting concerns and behaviours at one end and, with eating disordered individuals experiencing such concerns and behaviours to extreme levels at the other. Continuum approaches emphasise that as dieting behaviours and related concerns increase so does the likelihood of developing eating pathology. In continuum models the constellation of factors surrounding dieting behaviours are part of the origin of the eating pathology. Discontinuity approaches, such as Bruch (1973) and in part Crisp (1984), tend to acknowledge dieting or restrictive type behaviours as important factors in eating pathology, but emphasise the psychopathology as the source of such behaviours rather than the psychopathology being the consequence (e.g. Hsu, 1990; Lowe et al., 1996).

In the light of these different approaches the putative relationship between normative dieting and the clinical syndromes of anorexia and bulimia nervosa remains unclear, and very much dependent on conceptualisations of the disorders themselves (Hsu, 1990). With specific reference to anorexia nervosa Bruch (1973), for example, disagrees that the restrictive behaviour of anorexics can be compared with the restrictive practices found in normative dieting, as anorexia in her view represents a psychological attempt to achieve self-identity incorporating aspects of disturbed perceptual and cognitive processing totally unlike experiences found in dieters. Counter to this view it should be noted that the identity confusion which Bruch (1973) suggests underlies aspects of anorexia nervosa may also be interpreted in terms of a continuum view, as adolescent females tend to undergo elevated levels of identity confusion which may be more extreme in some than in others. Crisp (1967, 1980, 1984) interprets anorexia

nervosa as a psychobiological strategy used to offset and avoid fears relating to adolescent body weight and to maturity generally. Such a strategy reflects a determined attempt to adapt to the maturational challenges of adolescence and self-identity that emerge from social interaction. Crisp (1984) does agree, however, that society, or more precisely the individuals perception of social roles and pressures which relate to more than body image, has a major effect on the initiation of anorexia nervosa via maturational turmoil.

Some statistical evidence, based on trend testing, has been used to examine which perspective, continuity or discontinuity, best supports the data. The continuum view would hypothesise a tendency for eating disorder symptoms to increase consistently in relation with increased dieting behaviour as it expresses itself along the non-clinical to the clinical pole of the continuum. Discontinuity approaches would expect there to be no such trend as symptomatic behaviours are examined across the dieting continuum. Unfortunately, early studies based on examining participants with restrained eating attitudes and/or actual weight-loss dieting behaviours produced mixed results (see Lowe, et al. 1996). However, Lowe and colleagues (1996) point out that all the early studies failed to distinguish between weight-loss dieting behaviours and restrained eating attitudes without allied weight-loss behaviours.

Lowe et al. (1996) improved on previous studies by incorporating distinctions between behaviours and restraint attitudes/concerns in addition to a more refined examination of psychopathology. Findings indicated a positive trend along the dietary continuum with highest weight/shape concerns and psychopathology in bulimia nervosa (DSM III-R) followed by restraint concerned dieters, restraint concerned non-dieters, with non-restraint concerned dieters having the least level of concerns and eating psychopathology. Weight concerns and general psychopathology predicted a significant portion of binge behaviour variance in a multiple regression, but only weight concerns predicted significant unique variance in bingeing when psychopathology was controlled for and not vice-versa. The lack of predictive capacity of psychopathology in relation to weight/shape concerns in terms of bingeing fails to support discontinuity approaches that consider psychopathology as primary causal factor in disordered eating, compared to weight and dieting concerns.

Interestingly, Lowe et al (1996) found that there was a clear discontinuity between non-clinical and clinical groups in terms of actual binge behaviour, with bulimics demonstrating significant elevated levels of bingeing compared to non-clinical dieters and non-dieters. This finding holds some problems for the continuity hypothesis that equates increased dieting behaviour with increased bulimic (i.e. pathological) symptoms. This discontinuity may express the affects of purging behaviours on bingeing in the bulimic context, i.e. bulimics may be more willing to purge compared to non-bulimics and therefore may binge more frequently due to the more 'efficient' relief purging gives from overeating. Alternatively, Lowe et al. (1996) suggest that the level of overeating behaviour in non-clinical participants is not equivalent to bingeing in bulimics, a suggestion supported by Walsh, Kissileff, Cassidy, and Dantzic (1989) who demonstrated overeating in bulimics to be different from non-bulimics in terms of increased food intake rather than qualitative variables such as food type. An alternative explanation is that the bulimics studied by Lowe et al. (1996) were all volunteers with known bulimic histories and may have had less negative reactions to expressing their level of bingeing than the non-clinical sample. Also, it appears that the binge-eating factor derived from various sub-scales of the measures used did not differentiate objective and subjective types of bingeing behaviour, which may again be expressed differentially between clinical and non-clinical participants.

Another recent study by, Stice, Ziemba, Margolis, and Flick (1996), also found evidence for continuity between bulimics, sub-clinical bulimics, and non-bulimic controls on a number of factors including dietary restraint, body image internalisation, perceived social pressure towards thinness, and negative affect amongst other measures. In Stice et al.'s (1996) study bulimics evidenced the highest levels of the above factors followed by sub-clinical bulimics, and then controls, a difference that demonstrated a linear continuity when submitted to discriminant function analysis of the scores for each group. Psychopathological variables such as hostility, anxiety, and to some extent body dissatisfaction, did not reliably separate sub-clinical bulimics from bulimics, whereas controls were clearly differentiated from both groups on the basis of those variables. Again, the capacity for dietary restraint and related factors, rather than general psychopathological variables, to separate groups in a continuum-like fashion lends support to the continuity view. Unfortunately, Stice et al. (1996) formed their experimental groups on the basis of a questionnaire measure of bulimic tendencies (Bulimia Test - Revised: Thelen, Farmer, Wonderlich, & Smith, 1991) rather than more

reliable interview measures such as DSM III-R or IV, so it is difficult to directly assess the validity of their bulimic and sub-bulimic groups.

In summary, evidence from a wide range of sources appears to favour the continuity hypothesis and also indicates a potential causal relationship between dieting and eating pathology as suggested by researchers such as Polivy and Herman (1985). If these models are indicative of what is occurring it is important to clarify the factors that turn 'normative' level dieting into elevated dieting which acts as a risk factor for developing eating disorders. As mentioned earlier, the relationship between dieting and eating pathology is not straightforward as there are a large number of dieters who never develop eating disorders and the reason for this discrepancy should be addressed. One approach is to look for factors related to increased motivation to diet. Such factors as hypnotizability, receptivity to cultural suggestions indicating an acceptable female body aesthetic, and dissociation, that may moderate experiences of dieting concerns and experiences of self and control over action, provide initial variables for working hypotheses.

As mentioned previously, relationships between hypnotizability, dissociation, and aspects of problematic eating behaviours and attitudes, such as dietary restraint and concerns over weight and body image, have also been found in non-clinical populations. Most studies have adopted correlational designs to examine potential relationships, though some have also examined group differences amongst high and low eating concern individuals. These studies provide the foundation of this thesis in the non-patient domain and are examined in detail below.

### 1.3.3. Hypnotizability and patterns of eating attitudes in non-patient samples.

Groth-Marnat and Schumaker (1990) used a college sample of 102 females to examine possible relationships between hypnotizability, weight/food concerns, and body dissatisfaction. Overall scores on the Eating Attitudes Test (EAT: Garner & Garfinkel, 1979) and the Goldfarb Fear of Fat scale (GFFS: Goldfarb, Dykens, & Gerrard, 1985), a measure of motivation to avoid becoming fat that differentiates repeated dieters from non-dieters, were significantly correlated with hypnotizability as measured using the HGSHS:A, but at a low to moderate level (EAT:  $r = 0.30$ ; GFFS:  $r = 0.32$ ). Regression analyses indicated that hypnotizability accounted for 8.1% of

overall EAT variance ( $R^2$ ), whilst hypnotizability accounted for 9.6% of variance in the GFFS. It was unclear whether these variances overlapped, i.e. to what extent these variances were partial or semi-partial correlations accounting for the overlap between the EAT and GFFS measures which was indicated by a high correlation between these two measures ( $r = 0.68$ ). All these analyses hold after correction for Type I errors. High scores on the EAT, i.e. individuals with elevated eating concerns, scored significantly higher on the HGSHS:A than low scorers, and were generally above the average level of hypnotizability for the HGSHS. Higher EAT scores were interpreted as representing more concern over food intake and weight, in addition to potential elevated body image distortion and overestimation. Measures of age and socio-economic status did not differentiate between high and low EAT scorers.

These findings were interpreted as related to two putative influences of hypnotizability on non-clinical individuals. Waking suggestibility components of hypnosis were perceived as possibly mediating or moderating the receptivity of the individual to social stereotypes relating to slim female body aesthetics, leading to increased body concerns and motivation to diet. Transmission of these attractiveness stereotypes has been suggested to be highly relevant in familial contexts, especially those with excessive conformity, which tend to engender clinical eating behaviours (e.g. Bruch, 1977) and have been related to increased hypnotizability (Long, 1968; Shames, 1981). It should be noted that as no measure of dissociation was taken in this study and there was no item-by-item analysis of the HGSHS:A the influence of any dissociative component could not be assessed.

The relationship between waking suggestibility, dietary restraint, and body image estimation, was examined by Wybraniec and Oakley (1996) in 20 non-patient college students. A significant and strong positive correlation ( $r = 0.61$ ) was found between a measure predictive of hypnotic-like experiences called the Creative Imagination Scale (CIS: Barber & Wilson, 1979) and the cognitive restraint or conscious control over eating factor of the Three Factor Eating questionnaire (TFEQ: Stunkard and Messick 1985). Disinhibition of eating and susceptibility to hunger, also sub-scales of the TFEQ, did not correlate with CIS. The CIS examines imaginative suggestibility in terms of the subjective reality of suggested imaginary scenarios, and is generally predictive of hypnotic responsiveness when presented without a hypnotic induction but in an hypnotic context (Spanos, Gabora, Jarrett, & Gwynn, 1989), as it

was in this study. However, when used without hypnotic induction, the CIS is arguably better interpreted as a test of 'waking' suggestibility as opposed to hypnotic suggestibility which usually involves an hypnotic induction. The TFEQ is a measure of restraint and disinhibited eating components of dietary attitudes and behaviours, though the restraint factor also suggests a behavioural component related to successful dieting behaviour. These results strongly support the findings of elevated waking suggestibility in relation to dietary restraint, though the stronger correlation compared to Groth-Marnat and Schumakers' (1990) finding with the HGSHS, especially using a small sample size, suggests that imaginative components may be playing a significant part over and above other hypnotic mechanisms.

A recent study by Laidlow and Large (1997) suggests that the HGSHS:A and the CIS are measuring related yet distinct components, potentially the different extent to which imagery is related to suggestive processing. It is important to note that the cognitive restraint factor used here is supposed to represent successful, conscious, and deliberate restraint behaviours. Aspects of CIS responding may be related to attentional regulation and control, important factors relevant to maintaining a self-imposed cognitive control of dieting behaviours, which may or may not also be related to imagery generation.

Frasquilho and Oakley (1997) replicated the strong positive correlation between the restraint sub-scale of the TFEQ and the non-hypnotic CIS in their sample of 37 college students. The significant correlation obtained of  $r = 0.66$  was at near identical levels to the one found by Wybraniec and Oakley (1996,  $r = 0.61$ ), which may reflect the similarity of laboratory contexts and materials used. High and low restrainers were not procedurally differentiated in this study. Along with previous findings, this result indicates again the strong association between waking suggestibility and cognitive restraint. The CIS was again used without hypnotic induction, but was introduced in a hypnotic context thereby increasing its potential predictability in terms of hypnotizability (Spanos, et al. 1989).

A Socio-Hypnotic hypothesis similar to the previously mentioned association between waking suggestibility and cultural body image aesthetics was used to interpret the findings of the Frasquilho and Oakley (1997) study. The focus of this hypothesis was on the potential influence of hypnotizability on the hyper-internalisation of body



image ideals and dietary restraint concerns (Striegel-Moore, et al. 1986), with restraint attitudes and behaviours being an attempt to reduce potential discrepancies between the hyper-internalised ideals and self-perceived body shape. As the CIS was used in a waking, i.e. non-induction, context, relationships between hypnotizability and restraint can only be speculated upon, though individuals with higher hypnotizability were suggested as being potentially higher in levels of waking suggestibility. A second hypothesis suggested that hypnotic procedures might bring about body image or changes in somatic experiences. These changes may again influence the discrepancy between desired and self-perceived body image by momentary alterations in internalised self-image, possibly in undesirable directions such as body size and weight increase.

These approaches strongly imply a mediating framework whereby part of the relationship between social factors and restraint is supported by waking suggestibility. Suggestibility aspects of hypnotizability may increase salience of social cultural factors impinging on dietary concern and motivation. A large amount of restraint variance is was indeed explained in terms of waking suggestibility as measured by the CIS ( $r^2$  of 0.42, 42%) in Frاسquilho and Oakley's (1997) study. In addition, as the measure of restraint used (TFEQ cognitive restraint) implies a degree of success, it may be that attentional processes related to hypnotic responding and/or control of imagery help in maintaining successful restraint. In Frاسquilho & Oakley's (1997) study, the CIS also correlated significantly with the DES II ( $r = 0.59$ ), indicating that some of the variance in restraint could be accountable by dissociation, yet this was unlikely as dissociation was not significantly correlated with cognitive restraint ( $r = 0.31$ , ns). Further examination of partial and semi-partial correlations could have elucidated these issues, though use of more controversial stepwise regression found no influence of dissociation on restraint in this sample. However, the statistical basis of this procedure may have prevented extraction of some variance due to dissociation, rather than overall stepwise rejection of the dissociation measure. There were also significant correlations between dissociation and the disinhibition of eating and the susceptibility to hunger factors of the TFEQ, which may indicate that dissociation leaves individuals open to hunger related eating by reducing their cognitive control over eating and hunger cues. Alternatively, the physiological experience of hunger may be related to features of dissociative like absorption, and aspects of de-personalisation/de-realisation.

Experiment 2 of Wybraniec and Oakley (1996) assessed the effect of suggested body image changes in restrained and non-restrained eaters, an aspect of potential alterations in the discrepancy between idealised and self-perceived body image. Restrained and non-restrained eaters, defined using a median split of TFEQ cognitive restraint sub-scale scores, were given CIS type scenarios suggesting either a decrease or an increase in body size. As there was also a severe disproportion of participants in the restrained ( $n = 6$ ) and non-restrained ( $n = 23$ ) categories, with a clear possibility of accompanying unequal variances, non-parametric analyses were appropriately used. Responses to the items, which were rated in terms of subjective reality of generated images, found that restrainers did not differ in their response to the body size increase (fat) item compared to other similar CIS items, but they were significantly worse at imagining body size decrease (slim image). Non-restrainers scored significantly lower on the body image modification items for both fat and thin directions compared to other CIS items. Restrainers were also found to be significantly more suggestible to non-body weight items than non-restrainers, indicating a significantly higher level of responsiveness to neutral waking suggestibility items. Though restrainers and non-restrainers were not compared directly in a factorial design in terms of body size items, these results imply a resistance for both imagined body size decrease and body size increase in non-restrained eaters, whereas restrained eaters were resistant to only suggested body size decrease.

#### 1.3.4. Dissociation and eating patterns in non-clinical populations

The earliest examination of dissociation in a non-clinical sample appears to be by Sanders (1986) as part of the validation of her then newly created measure of dissociation the Perceptual Alteration Scale (PAS). Sanders found significantly higher dissociation scores in college students with binge related eating patterns compared to students with non-bingeing eating patterns. The PAS was constructed around the same time as the original DES, but was derived from Minnesota Multiphasic Personality Inventory items most related to Hilgard's (1977) description of his neo-dissociation theory of hypnosis. The apparent sub-scales extracted from the initial analysis were modification of regulatory control, modification of affect, and modification of cognition. Unfortunately, the use of affect items allows for a confound with affective reactions unrelated to dissociation *per se*, though affective modification is an important theoretical aspect of dissociative process, as can be seen in terms of the dissociative

escape model described previously. Affective and non-affective factors may be extracted from the overall PAS, though a recent study by Fischer and Elnitsky (1990) suggest that the published version of the PAS 27-item scale (as opposed to the full 60+ items scale) may be measuring a more unitary dimension based on affective dissociative processes, compared to scales such as the DES which examines more cognitive features.

Rosen and Petty (1994) used the DES and the PAS, to conduct a broad analysis of dissociation in relation to patterns of eating based on a measure of bulimic eating behaviour (Bulimia Test, BULIT: Smith & Thelen, 1984) and a measure of overall eating-disordered behaviour (EDI: Garner, Olmstead, & Polivy, 1983) in 140 college students. The overall mean score on the DES was 14.3, generally around the level found in previous studies for bulimics, whilst the overall PAS mean was 50.6 which was well under the 90.22 mean found by Sanders (1986). The DES and PAS were only moderately correlated with each other ( $r = 0.26$ ). The DES, generally associated with cognitive type dissociations when used as an overall scale, correlated with almost all bulimic sub-scales of the BULIT except the food concerns sub-scale, with correlations tending to be moderate with a minimum of  $r = 0.26$  for bingeing to a maximum  $r = 0.34$  for the overall BULIT and feelings of being controlled by food. The overall PAS significantly and positively correlated, to a moderate level, with all the factors related to bulimic attitudes and behaviours, with correlations ranging  $r = 0.35$  with feelings of food controlling ones life, to  $r = 0.19$  for weight fluctuation.

Rosen and Petty (1994) also examined correlations between the BULIT scales and sub-scales of the PAS (modification of control, modification of affect, and modification of cognition). The PAS modification of affect and control sub-scales were significantly correlated to a positive and moderate degree with most factors related to bulimic behaviour (bingeing, vomiting, affect, food concerns). The highest of these correlations were found with the modification of control sub-scale, especially with total BULIT ( $r = 0.53$ ), affective reactions ( $r = 0.53$ ), and binge eating ( $r = 0.46$ ). Modification of affect significantly correlated, at a lower level, with each BULIT factor ranging between  $r = 0.21$  (food) and  $r = 0.29$  (affect). Food and non-food related items on the PAS all correlated with aspects of bulimic behaviour, however, food items paralleled correlations for the modification of control sub-scale, whilst non-food items copied the modification of affect sub-scale correlations. These patterns of repetition were not surprising, as food items comprised a majority of the control sub-scale items,

whilst the non-food items were mostly from the affect part of the affect sub-scale. It should be noted that Rosen and Petty's definition of food items was peculiar, in that they included items more akin to control over body sensations, rather than food *per se*. Notably, the modification of cognition sub-scale did not correlate with any of the factors on the BULIT.

In terms of general abnormal eating patterns characterised by the EDI, Rosen and Petty (1994) also found that the DES significantly correlated with total EDI score ( $r = 0.40$ ), and most of the eating disordered sub-scales, including drive for thinness ( $r = 0.26$ ), body dissatisfaction ( $r = 0.22$ ), ineffectiveness ( $r = 0.38$ ), perfectionism ( $r = 0.25$ ), interoceptive awareness ( $r = 0.35$ : i.e. awareness of internal emotional states and ongoing cognitions), and maturation fears ( $r = 0.31$ ). However, the DES did not correlate with the bulimia or interpersonal distrust sub-scales. The overall PAS correlated with the total EDI ( $r = 0.34$ ), drive for thinness ( $r = 0.27$ ), body dissatisfaction ( $r = 0.27$ ), ineffectiveness ( $r = 0.21$ ), and interoceptive awareness ( $r = 0.32$ ) sub-scales. No correlations were found between the total PAS or DES and aspects of bulimic behaviours as defined by the EDI bulimia sub-scale, suggesting that in non-clinical samples at least, bulimic tendencies as measured by the EDI are not influenced, i.e. facilitated by dissociation as suggests by features of the dissociative escape hypothesis. However, this goes against findings using the BULIT, which do suggest a potential influence.

When considering the PAS sub-scales, the same study found that the PAS modification of control sub-scale showed the strongest significant and positive correlations with a variety of EDI sub-scales ( $r$  s ranging from 0.46 with interoceptive awareness, to 0.28 with maturity fears), including drive for thinness ( $r = 0.44$ ) and body dissatisfaction ( $r = 0.42$ ), but not for perfectionism and interpersonal distrust. The modification of cognition sub-scale again failed to correlate with any of the EDI sub-scales. The modification of affect PAS scale failed to correlate with bulimia, perfectionism, distrust, and maturity, but showed significant moderate correlations with the rest of the EDI (ranging from  $r = 0.34$  for the total, to  $r = 0.27$  drive for thinness) including body dissatisfaction ( $r = 0.27$ ). Again, PAS food item and non-food items correlations mimicked patterns of the control and affect sub-scales, respectively. Overall, in terms of the PAS the bulimia sub-scale only correlated with the modification of control sub-scale of the PAS and personality variables that related to disordered

eating (perfectionism, interpersonal distrust, and maturity fears) failed to correlate with aspects of the PAS.

Rosen and Petty's (1994) results again suggest that dissociation is indeed related to multiple aspects of disordered eating behaviours, even in non-patient populations. The strongest correlations were for the modification of control scale, indicating a possible feature of reduced behavioural or action control associated with non-clinical aspects of bulimic symptoms. However, it is not clear whether eating disordered outpatients or individuals with eating disordered histories slipped into the analyses, as the investigators had no screening system in place. It should also be noted that the PAS overall scores tended to be lower for this sample than previous studies (e.g. Sanders, 1986). This may have been due to using the 27-item version of the scale, extracted from the Sanders (1986) paper, rather than the full 60 item version available from Sanders herself. In addition, the analyses would also have profited from some form of regression and factor analytic techniques to identify which factors were more salient in interpreting these complex matrices.

Two studies by Valdiserri and Kihlstrom (1995a, 1995b) also examined EDI scores, this time in relation to the modified DES. Initial findings for a group of 656 student, which included 270 men and 386 women, indicated that dissociation for women was significantly correlated with every EDI sub-scale with correlations ranging from  $r = 0.36$  for interoceptive awareness to  $r = 0.13$  for interpersonal distrust, with men expressing lower correlations between dissociation and the EDI scales. Drive for thinness, body dissatisfaction, and bulimic tendencies were correlated at  $r = 0.26$ ,  $r = 0.17$ , and  $r = 0.20$  with dissociation, respectively (all Pearson's product moment correlations). These scores relate well to Rosen and Petty's (1994) findings, except for the significant correlation with bulimia found in the Valdiserri and Kihlstrom (1995a) sample. The DES was significantly correlated with both abnormal eating and ego dysfunction related items of the EDI, with women obtaining higher correlations than men, and especially for the ego dysfunction items ( $r = 0.38$ ). In a stepwise regression procedure, ego dysfunction EDI items accounted for a significant proportion of dissociation scores compared to abnormal eating items. A conclusion of this study was that dissociation is better related to ego dysfunction, rather than abnormal eating per se, based primarily on the higher correlation between personality characteristics than abnormal eating. The investigators also argued that the relation between dissociation

and disordered eating is unclear and may be mediated by different, hidden, aspects of potential pathology.

The second study by Valdiserri and Kihlstrom (1995b) examined 241 female students on the EDI and the DES, this time using additional measures of psychopathology examining depression and anxiety type disorders. As previously found, dissociation significantly correlated with most of the EDI sub-scales, except for body dissatisfaction, maturation fears, perfectionism, and interoceptive awareness. Drive for thinness, and bulimic tendencies correlated  $r = 0.25$  and  $r = 0.29$  respectively, with the DES. Ego dysfunction correlated slightly more with dissociation more than abnormal eating  $r = 0.21$  and  $r = 0.19$  respectively, with these overall correlations being lower than the previous study. However, measures of psychopathology were noted to correlate much more highly with the EDI scales than did dissociation, revealing especially high correlations occurring with depression. When placed into a regression model, dissociation did not account for any additional variance in abnormal eating or ego dysfunction over and above that of the other psychopathology scores. However, the nature of the regression model was not mentioned, and as different forms of regression may be able to identify unique variances present in the dissociation scores, the extent to which dissociation can be ruled out by such analyses is uncertain.

Everill et al. (1995), who focused principally on bulimics in their investigation of dissociation, also reported some non-clinical findings, indicating that overall scores on the Eating Attitude scale, and its bulimia attitudes sub-scale correlated to a weak extent with overall dissociation on the DES II ( $r = 0.20$  and  $r = 0.23$  respectively). Absorption and depersonalisation sub-scales of the DES II also correlated with eating attitudes ( $r = 0.19$  and  $r = 0.17$ ). These low correlations may have been due to low scoring on the EAT, or on the assumed skewed distribution of DES II.

Frasquilho and Oakley (1997), as mentioned previously, also used a measure of dissociation, the DES, in their study, finding significant correlations between dissociation and the disinhibited eating ( $r = 0.55$ ) and susceptibility to hunger ( $r = 0.49$ ) sub-scales of the TFEQ. These results were interpreted as support for a dissociative involvement in escape from self-awareness (Heatherton and Baumeister, 1991). The focus of interpretation was again on dissociative experiences being indicative of a general capacity to disengage from higher cognitive mechanisms seen as critical for

inhibitory control of behaviour, allowing external cues to act uninfluenced by such inhibitory restraint processes. Susceptibility to hunger may also be heightened when cognitive strategies to avoid such signals are not accessible, especially when attentional focus is shifted to more somatic levels as Heatherton and Baumeister (1991) suggest that the cognitive shift tends to be towards somatic phenomena. Alternative explanations exist such as Root and Fallons' (1989) approach to disinhibited eating as a cause of euphoric dissociative like experiences that defend against negative affect, however, this conception is based upon the presence of purging behaviours which may not be so relevant in non-clinical populations (e.g. Lowe et al, 1996).

#### 1.3.5. Summary of hypnosis and dissociation in relation to non-patient eating patterns: Principle frameworks for hypotheses.

Overall, there is good evidence that both hypnotizability and dissociation are related to non-clinical eating behaviours. Hypnotizability appears to be related to general eating disordered symptoms and specifically with restraint concerns. However, imaginative aspects of waking suggestibility, as measured by the CIS, do not seem to be related to disinhibition of eating or susceptibility to hunger. Dissociation also seems to be correlated with a number of eating disorder related features, but relationships between bulimic type behaviours are not well correlated or robust, despite moderate to strong correlations with overall measures such as the BULIT and aspects of disinhibited eating and susceptibility to hunger based eating.

The principle theoretical frameworks that have emerged parallel to some extent those proposed in the eating disorder literature. One potential framework is that hypnotizability may be involved in mediating and/or moderating restraint type concerns and behaviours, both features of the dietary restraint concept, and dissociation may be related to disinhibited eating type features. A certain lack of association between bulimic symptoms and dissociation in these studies may be due to the inclusion of purging criteria in some of the scales used, which may obscure possible relationships with only disinhibition/overeating components.

The putative moderating role of hypnotizability may fit well into the general hypothesis that it is indicative of a suggestive influence related to motivating dieting behaviour or restrained eating concerns. Imagery aspects may also play a role within the

#### 1.4. Summary of Chapter 1.

This chapter has focused on the main empirical and theoretical pillars of the thesis, examining hypnotizability and dissociation in relation to aspects of disordered and non-clinical eating behaviour. Despite understandable variation in studies, a number of hypotheses have emerged relating to the potential role of hypnotizability and dissociation in clinical as well non-clinical eating patterns. Hypnotizability does not appear related to actual eating disorder severity, but may be in part related to dissociative mechanisms common to aspects of bulimic experiences and hypnotic responding. A related, yet alternative hypothesis focuses on the suggestibility components of hypnotic responsiveness. This 'Socio-Hypnotic' hypothesis (Groth-Marnat & Schumaker, 1990; Frasier & Oakley, 1997) outlines the possible mediating and moderating effects of elevated suggestibility in internalising cultural pressures to achieve a thin body image aesthetic. Dissociation is a more complex issue, but there are results that suggest that it is related with disinhibition type processes that in turn may be related to bingeing behaviours. The escape model was outlined to provide one of a number of frameworks for interpreting the potential role of dissociation and dissociative experiences in developing and maintaining problematic patterns of eating.

The focus of this thesis is on the non-clinical eating patterns related to restraint and disinhibition, and the productive application of the theoretical frameworks, outlined above in the non-clinical literature, for generating hypotheses. The potential link between non-clinical restraint/disinhibition behaviours and clinical eating problems, and a general set of supportive non-clinical findings, provide the starting point for this thesis. However, despite developing the initial stages of the theoretical argument, there is a need to examine in greater depth some of the most significant issues relevant for this thesis. These concern the key concept of non-clinical restraint, and its relationships with disinhibition as well as overall relationships with dieting attitudes, restraint concerns, and restraint behaviours. However, to start with it is more important to examine the nature and components of hypnotic and waking suggestibility as they relate to a Socio-Hypnotic approach to influences associated with the internalization of dietary restraint concerns. It is also important examine dissociation in terms of their theoretical and empirical underpinnings. These and related issues are explored in chapter 2.



## **Chapter 2**

### **Theories, definition and measurement of hypnotizability, dissociation, and dietary restraint.**

#### **Chapter Overview.**

This chapter focuses on the theoretical and measurement approaches that provide an opportunity for advancing the issues covered in chapter one. The concepts of dietary restraint and dietary disinhibition are examined in more detail, and a current social cultural model of eating disorders (Stice, 1994) incorporating these concepts is presented. However, before examining the construct of dietary restraint and related features, the nature of hypnotizability and dissociation, which are central to this thesis, are examined. Key theoretical and empirical approaches to the definition of hypnotizability and dissociation are considered in the first section.

#### **2.1. Defining and measuring the concepts of hypnotizability and dissociation.**

In chapter one a number of studies were reviewed that used a variety of measures of hypnotizability and dissociation. From these studies a number of hypotheses arose that implicated responsiveness to hypnotic suggestion and capacity to experience dissociative phenomena as factors of restrained and disinhibited eating. An important feature of this thesis is the use of standardised measures of hypnotizability and dissociation. The nature of these measures and the concepts they putatively embody is addressed in this section.

In the research reviewed in chapter one hypnotizability has been repeatedly referred to as a phenomenon related to dissociation, principally due to the similarity in subjective experiences shared between hypnotic 'states' and dissociative episodes. It was also argued in chapter one that the dissociation view of hypnotizability was not adequate in fully explaining hypnotic phenomena with other factors requiring consideration. Another definition of hypnotizability used in chapter one has been as an

index of suggestibility, an indicator of the degree of receptivity to social-cultural influences, and, with specific reference for this thesis, to the internalisation of social pressures to be thin (e.g. Covino, et al., 1994). Though such receptivity may be non-pathological in itself it may help set up subsequent pathological concerns and behaviours in combination with other potential vulnerability factors.

Dissociation was referred to in chapter one as a process involving separation of mental processes and functions, a definition based initially on Janet's seminal pathology-orientated approach, which may also facilitate the reception of suggestive communication (e.g. Schumaker, 1991a). In chapter one, dissociation was also commonly framed as a potential defence against traumatic experiences, a defence which may develop over time into a maladaptive psychological process (e.g. Torem, 1986). However, dissociation was also referred to in relation to non-pathological phenomena. Definitions of dissociation may therefore be complex, incorporating both pathological and non-pathological dimensions. Such complexities are addressed here with an aim to provide an interpretative background for the measures used in subsequent empirical chapters within this thesis.

### 2.1.1. Defining hypnosis and hypnotizability.

Insights from psychometric investigations and other studies have helped in identifying some key factors in the expression of hypnotizability. However, despite the availability of a variety of hypnotizability measures there has been remarkably little agreement concerning the nature and definition of the terms hypnosis, and hypnotizability. The problem is not that there is a paucity of definitions, rather that there is a burgeoning literature expressing perhaps too many divergent views on what constitute the core aspects of these phenomena.

These divergent views about hypnosis are based on a continuing debate over its status as either a state characterised by unique causal properties or as a consequence of normal social psychological processes. Clearly, this lack of definitional coherence poses difficulties in interpreting associations between hypnotizability, and other factors of research interest such as dissociation. It is argued here, on the basis of work by Wagstaff and others (e.g. Wagstaff, 1998; Woody, 1997) that the problems basically

pivot upon semantic issues, with such issues obscuring points of convergence within the domain of hypnosis.

### 2.1.2 The semantics of hypnosis.

The central debate about whether hypnosis is an altered state of consciousness, qualitatively different from waking experience, or is a product of everyday psychological processes has had profound repercussions and has historical roots as far back as the investigation of Mesmerism, over two hundred years ago. At the core of these debates have been the hypnotic phenomena themselves, namely apparently accentuated responses to suggestion, the perception of hypnotic behaviours as involuntary and automatic, and the apparent individual differences in hypnotic responsiveness.

The contemporary question as to whether hypnosis is an altered state of consciousness was once the most hotly disputed issue in the area (Kirsch, 1992). Hypnosis researchers have traditionally occupied two opposing camps; the State and Non-State positions. State or 'trance' theorists believed that hypnotic phenomena were caused by a unique altered state of consciousness radically different from non-hypnosis or 'waking' states, and responsible for the hyper-suggestibility and involuntariness experienced by hypnotized individuals. Altered state conceptions about hypnosis arose in part because the behavioural and subjective phenomena produced 'under hypnosis' represented, *prima facie*, radical departures from the domain of so-called 'normal' experiences. However, it is difficult to characterise what is meant by 'normal' conscious processing, let alone define how an altered state may be characterised as these terms can be highly relative.

Non-State theorists rejected the need for an altered state explanation, believing such an approach was inevitably misleading as many so called 'trance' behaviours could be enacted by non-hypnotized individuals (e.g. Barber 1969; Sarbin & Coe, 1972). Hypnotic effects could therefore be explained by psychological factors, such as voluntary goal-directed role enactments (Spanos, 1985) or compliance behaviour (e.g. Shames, 1981), present in non-hypnotic, 'waking' states (Kirsch, 1992). The non-state viewpoint, also known as the socio-cognitive or socio-behaviourist position, generally focused on how a willingness, or not, to imagine or behave in accordance with hypnotic

suggestions was moderated by attitudes, motivations, expectations, and contexts (e.g. Kirsch, 1991; Wagstaff, 1991; Barber, 1991; Spanos, 1986). However, non-state positions have varying difficulty in accounting for the processes responsible for what they see as the illusory experience of apparent involuntariness associated with performing hypnotic suggestions.

Over the last few decades, and specifically in recent years, the state/non-state issue has pivoted on the semantics of the term 'state' (e.g. Wagstaff, 1998). After a decade of ferocious debating a number of state-based researchers redefined the term hypnotic 'state' to imply a descriptive framework, 'a kind of shorthand, with no causal properties or defining features attributable to it' (Kihlstrom, 1985). It has been pointed out that this descriptive usage of 'state' tends to render views based upon it unfalsifiable, and therefore scientifically meaningless (Kirsch, 1992). Whilst side-stepping the issue of defining the properties of an altered state, this re-conceptualisation still leaves open the possibility of discovering psycho- and neuro-physiological substrata of hypnotic performance, a research domain with increasing output over the past few years (e.g. Crawford & Gruzelier, 1992; Crawford, 1994; Crawford, 1996; Ray, 1997).

Wagstaff (1998) has pointed out that the term 'state' can be used effectively to define a number of possible features, without necessarily implying unique properties or special causal capacities outside normal psychological processing. For example, an hypnotic 'state' may be interpreted, as Barber (1991) suggests, as a form of awareness in which a vivid imagination based 'reality' is created in reaction to suggestions from others, the self, or the environment. The key issue here is that the term hypnotic 'state' may be retained as a general term indicating a particular state of mind in relation to a particular procedure or hypnotic ritual. An altered state of consciousness can be redefined as a variation in conscious experience, possibly characterised by a particular over-arching principle or multiple set of related features. Rather than being merely descriptive, this allows researchers to investigate the features of these hypnotic 'states of mind' for commonalities and differences. However, even a descriptive use of the term 'hypnotic state' has significant negative repercussions. Such repercussions centre on perpetuating negative stereotypes, in public and scientific domains, namely that altered states indicate sub-optimal psychological functioning, possibly associated with mental dysfunction, or esoteric belief systems.

The core issue of semantics clearly has specific relevance to defining hypnosis. Before considering these issues further it is worth bearing in mind a recent a-theoretical statement of the constituents of hypnosis, published by the American Psychological Association Division of Hypnosis (APA, 1994). The description indicates that 'Hypnosis is a procedure during which a health professional or researcher suggests that a client, patient, or subject, experience changes in sensations, perceptions, thoughts, or behaviour'. The description continues by stating that hypnosis generally involves an hypnotic induction, assuming a variety of forms, and that people vary in their experience of, and responsiveness to, hypnosis. Some major misconceptions are also addressed in that hypnosis does not lead to loss of control or awareness, and whilst hypnosis makes it easier for some individuals to experience suggestions it does not force these experiences upon them.

The APA description emphasises the nature of hypnosis as a *suggestive procedure* that involves the suggestion of alterations in cognition and behaviour, but does not imply their occurrence. The fact that people do differ in responsiveness to hypnotic suggestions and in the nature of the subjective components of hypnosis justifies a search for why these differences occur. These differences are potentially the result of multiple factors, related to both the context of the hypnotic procedure and to aptitudes of the person as they interact with such contexts.

Wagstaff (1997; 1998) identifies the core problem of defining hypnosis as a category error (Ryle, 1949), in which hypnosis is erroneously reified as an unique construct separate from its psychological and social constituents. A similar distinction is made in terms of hypnotizability measurement by Woody (1997), between traditional views where hypnotizability is a uni-dimensional ability which affects scores on hypnotizability measures, and hypnotizability scores as constructs emerging from various different factors operating as interactions and main effects. The subtle distinction revolves around either conceptualising hypnosis/hypnotizability as a cause, or as the result of various constituents processes. Given that hypnosis is a multidimensional and potentially multidetermined construct the issue turns to what factors are relevant in determining level of hypnotic responding. This issue is intimately linked to the measurement of hypnosis, which will be discussed shortly. Candidates for processes underlying hypnosis have included suggestion, absorption, imagination,

expectation, dissociation, attentional processes and a whole list of other potentially interrelated factors.

The increasing breadth of hypnosis research has recently been re-conceptualised as a multidimensional continuum (Kirsch & Lynn, 1995) with the traditional dichotomy of state vs. non-state occupying polar positions. This theoretical diversity provides a rich source of different perspectives on a complex issue, but tends to be supported by contradictory semantic distinctions which establishes barriers between viewpoints that can obscure the key convergent feature of hypnotizability, its multidimensional complexity. Different researchers tend to adopt methodologies favourable to their position, and have rarely developed paradigms that place competing theories against one another. This form of latent controversy has not helped tease out the relative importance of different factors in contributing to hypnotizability, and has in addition prevented a synergistic examination of the complexity of hypnosis. However, despite such disagreements, and with the relative reduction of sharp distinctions such as state/non-state, a core feature of hypnotizability has remained, though researchers vary in their attention to it, and this is the factor of suggestibility underlying hypnotic responding.

Related to the increasing breadth of hypnosis research and reminiscent of the outdated state/non-state debate has been the two-factor approach to hypnotic responding, which was briefly mentioned in chapter one. A number of researchers (e.g. Shor, Orne, & O'Connell, 1962; Tellegen, 1979; Balthazard & Woody, 1992; Woody, Drugovic, and Oakman, 1997) have suggested that hypnotic responding can be partially captured by adopting two different factors which underlie different types of hypnotic performance. In brief, the harder items on hypnotic scales may be based on trait like factors related to heightened dissociation, absorption, fantasy proneness, and imaginative involvement, similar to old state type views. The second factor of the model suggests that the easier items on hypnosis scales are based upon context, expectation, and motivational factors, related perhaps to different suggestibility processes than the first trait like factor and more amenable to a non-state view. However, despite its simplicity the two factor model does not directly account for interactions between the two supposed factors, but does leave open the possibility that different types of complex processes may mediate levels of hypnotic responding, potentially referring to different types of suggestibility.

### 2.1.3. Hypnotizability and suggestibility.

The measurement of hypnotizability is predominately a measure of responsiveness to suggestion as indicated by the APA (1993) definition cited above, with hypnotic instruments being generally used as indicators of suggestibility (Schumaker, 1991a). Some concerns have been raised that the use of hypnotic suggestibility tests constrains the study of suggestibility to just a hypnotic domain. However, few researchers would argue against the point that hypnotizability measures are in fact measures of a kind of suggestibility. Kirsch (1997) indicates that tests of hypnotizability are in reality tests of suggestibility with the addition of hypnotic induction. In a basic sense, associations found between measures of hypnotizability and other variables indicate the extent to which suggestibility itself relates to those measures. However, suggestibility is a complex phenomenon in its own right (Schumaker, 1991b), and is unlikely to represent a monolithic construct. The use of different types of suggestion in hypnotic tests, ranging from direct suggestions to elicit bodily movements (ideo-motor suggestion), to suggestions related to alterations in subjective experiences (e.g. positive and negative hallucinations, and general cognitive alterations such as amnesia) allows for more specific examination of different suggestion typologies.

Shames (1981), indicated that compliance, in terms of majority influence based on Asch's classic line-judgement studies (1956), correlated well with hypnotizability ( $r = 0.55$ ,  $p < 0.05$ , 1 tailed) as measured using the overall HIP (Hypnotic Induction Profile: Spiegel, 1974). More recently, Woody, Drugovic, and Oakman (1997) found that placebo suggestibility, based on suggested somatic effects of a placebo 'alcohol' drink, correlates better with the easier items on the Stanford Scales (SSHS:C; and HGSHS:A), than the harder items. These findings are discussed in more detail below when assessing issues relevant to measuring hypnotizability. The above two studies support in part the empirical relationship between measures of hypnotizability and suggestion, which supports the view of hypnotizability scales are basically measures of suggestion. Unfortunately, there are very few available tests of non-hypnotic suggestibility. The Asch paradigm from social psychology, and the alcohol placebo from addiction research (Fillmore and Vogel-Spratt, 1994), are amongst the few that have been used in the hypnosis domain. The extent to which hypnotizability tests capture different types of suggestion is an issue of further and continuing research, but

the notion that hypnotizability contains elements of suggestibility is hard to refute either theoretically or empirically.

#### 2.1.4. Defining the concept of dissociation.

The conceptual relationships between hypnotic phenomena and dissociation are provocative. Both are based upon putative alterations of self/world perceptions and perceptions of control and voluntary action. The conceptual frameworks surrounding dissociation and hypnosis have been intertwined since Janet (1889) proposed hypnosis as a pathological dissociation or 'désagrégation' of normally integrated personality processes. This approach defined dissociation, and hypnosis, as expressing marked discontinuities in normal experience of self and world. Contemporaries of Janet such as William James and Morton Prince contested the pathological and discontinuous quality of dissociation, and indicated that dissociation was present in everyday non-pathological experience, to varying degrees within different individuals.

Much later, Hilgard's (1977) work was credited with bringing dissociation and hypnosis out of their relative obscurity in the field of pathology, and into everyday experience and the psychology laboratory. Unfortunately, the concept of dissociation, like hypnosis and hypnotizability, also suffers from semantic difficulties, principally a lack of coherent definition. This has led to its emergence as an umbrella term covering an extensive range of phenomena, which in turn reduces its descriptive and explanatory efficacy (e.g. Wagstaff, 1998; Cardeña, 1994) undermines its influence. The principle of separating psychological components, e.g. thoughts, feelings, or behaviours, from ongoing conscious awareness (Bernstein & Putnam, 1986) lies at the core of the dissociation concept, indicating the dis-integration of normally integrated, or associated, psychological and behavioural mechanisms. However, while putative features of dissociation such as lack of cognitive integration, splitting, and functional autonomy of cognitive systems, allows an initial inroad into defining dissociation, these are unfortunately applicable to a wide range of potentially disparate phenomena.

Problems with the clarity and over-extension of the term 'dissociation' has led some investigators (e.g. Frankel, 1990, 1991; Wagstaff, 1998; Cardeña, 1994) to urge serious caution over its use in descriptive contexts. Cardeña (1994) suggested a taxonomic scheme that may add elements of precision to the definition of dissociation



in terms of separate typologies consistent with the literature in the area. Cardeña's three taxonomic domains include, the operation of mental modules that function fairly autonomously outside conscious awareness; fundamental alterations and separations in experience of self and reality, and finally a defensive function guarding against extreme situations and responsible, in part, for potential psycho-pathological manifestations. This taxonomic scheme acts as a good guide for some of the issues to be discussed next.

#### 2.1.5. Dissociative continuities and discontinuities: The functions of dissociation.

A significant problem regarding dissociation is the wide ranging application of face valid definitions of the term, extending from disparate clinical syndromes such as Dissociative Identity Disorder (DID) - formerly Multiple Personality Disorder, to normative dual task phenomena like driving a car whilst holding a conversation. A basic assumption underlying these face valid categorisations is that dissociation represents a continuum of experiences ranging from the mundane to the pathological. In one sense, modern perspectives on dissociation can be seen, ironically, as divided between clinical and non-clinical frameworks. Dissociation originated and is perpetuated as a primarily clinical phenomenon, finding its conceptual locus in a variety of clinical contexts, primarily in the nosology of the dissociative disorders for which it provides a working conceptual framework for directing diagnosis and treatment (e.g. Nemiah, 1989; Braun, 1988). A main clinical perspective focuses on dissociation as a defence mechanism, initially adaptive against overwhelming psychological and physical stress as a means of deflecting potentially harmful realisations or experiences, keeping them from consciousness. However, the concept of dissociation as a disrupting process is also central in these clinical conceptions, as initially adaptive dissociation may lead to potential psychopathology by generalising to other aspects of everyday psychological functioning.

While case reports of clinical dissociation often provide fascinating accounts of behaviours radically beyond normal experiences, another view of dissociation relates more to everyday monitoring and control of behaviour and cognition. An understanding of dissociation as a normal aspect of everyday life is inherent in a variety of non-clinical approaches to the phenomenon, especially Hilgard (1977); Spiegel (1990); and Bowers's and colleagues (Bowers 1992, 1990; Woody and Bowers, 1994). Non-clinical approaches to dissociation have tended to focus on cognitive models of human

information processing, where a majority of cognitive processing activity is multi-modal and occurs outside awareness (e.g. Baars, 1988). Normal dissociation, generally defined as the autonomous operation of cognitive mechanisms without the need for conscious monitoring, is a core feature, a *given* (Beahrs, 1983), of normal information processing (e.g. Hilgard, 1977; Bowers & Woody, 1994).

'Normal' dissociation is also seen as an adaptive feature of consciousness. Schumaker (1991b) eloquently describes the adaptive value of normal dissociation as a regulator of cognitive resources, allowing particular mechanisms to function without higher level monitoring and control processes. In this mould dissociation also defends against cognitive overload and mental exhaustion that may arise if focused mental activity were required for all mundane tasks. Dissociation, therefore, reflects the fluidity of cognitive operations. However, dissociation may also act as a partial psychological defence, in the form of reality-transcendence (Schumaker, 1991b), against rumination related to impinging existential conflicts which constrain human life (Ludwig, 1983).

Another consequence of normative dissociation theories that impacts strongly on interpretations of selfhood is the implication of a multifarious psyche. As Bowers and Woody suggest, '...the mind is already, in a sense, deeply divided (among many parallel modules), and higher conscious functioning somehow acts to bridge these gaps' (1994, p.56-57). The perception of a unitary or integrated experience of self is an illusion constructed by the higher level integrative functions which encapsulate everyday experience under a first person perspective, the experiential 'me', the essence of ongoing personality and self. The role of consciousness, it has been argued, is to 'help integrate otherwise dissociated functions' (Baars, 1988), providing perhaps a conscious workspace for the deliberate controlled manipulation of information processing towards a specific, often novel, goal. The essentially dissociated nature of mind becomes evident in situations where the 'wiring under the board' is revealed through a weakening or reduction of the higher level integration of consciousness (Bowers, 1990, 1992; Woody & Bowers, 1994). The 'wiring' refers to the disparate components that make up an individual, which to at first sight appear as a unity, but can revealed their dissociated nature when everyday integration is reduced.

Addressing the issues of clinical and non-clinical dissociation begs the question of their relationship, if any. Apart from sharing conceptions of separated modules and

adaptive functioning, these potential types of dissociation seem to pivot around different assumptions, mainly as either a clinical defence or as a normal process. A number of researchers have suggested that clinical and non-clinical forms of dissociation may differ in terms of extent, rather than typologies (e.g. Bernstein & Putnam, 1986; Nemiah, 1989; Ludwig, 1983; Hilgard, 1977). Such approaches hark back to historical views of such as that of Morton Prince (1909, cited in Frankel, 1990), who was the first to identify the relatively unnoticed forms of everyday dissociation and the more apparent forms related to clinical pathology. Clinical dissociation can be seen as representing an overtaxing of normative dissociative functions employed in the defence from *extreme* experience. However, by definition such clinical dissociations may no longer operate by the same process as normative dissociation, introducing a dimension of qualitative difference, at least once the pathological dissociation is established and altered by overtaxing of defensive systems. Of course, the possibility is open that clinical dissociation is underpinned by radically different processes that merely resemble those involved in normative dissociation.

Theories of normal and clinical dissociation share the notion that mental systems become separated from conscious self-awareness, but are not completely isolated from all cognitive processing. This point is important for both normative and clinical dissociation, and provides an additional communality between these forms of dissociation. In normative cognitive functioning, a network of interrelated associated sub-systems is required to complete complex behaviours, but the dissociated network does not require access to higher level conscious processing (self-awareness) as such. Likewise, in clinical dissociation a separated sub-component may be generally excluded from self-awareness, but still influence other aspects of cognitive functioning, which may lead to the pathological manifestation of the dissociated materials via alternate routes.

#### 2.1.6. Dissociation, suggestion, and hypnotizability.

Gheorghiu (1989) states there are times when a rational balancing of potential actions or behaviours is less desirable than more automatic processes, especially if action must be initiated immediately. Behaviours that are well learnt need less high level resources to accomplish, and therefore can be instantiated more or less automatically. This is not to say that such procedures are not goal directed, in fact in

many situations the essence of procedural training is its goal-directed nature which is incorporated in the procedural encoding. Again the interactions between higher level processing and lower level dissociated processes are the key concept. As a related aside, Shallice and Norman's (1980) model of Contention Scheduling and Supervisory Attentional System captures the cognitive architecture of the lower and higher level distinctions suggested here. Dissociation allows environmental inputs to be 'filtered' with some requiring only lower level responses, leaving higher level capacity free for engaging in novel or abstract processing. In a fashion, this dissociative processing of environmental cues and messages forms the basis of suggestive processes.

Schumaker (1991a) identifies dissociation as an essential process for the operation of suggestive communication. By reducing higher level moderation of lower level systems external suggestions may act more or less uninterrupted on these lower systems. By circumventing the 'conscious monitoring authority' (Gheorghiu, 1989) suggestions can externally modify behaviour and thought, with dissociation acting as a potential facilitator and therefore an indicator of the capacity for such circumvention. Of course, whilst the engagement of higher level functioning is adaptive in a variety of circumstances, especially novel situations, automatic receptivity to social suggestions is also fundamentally adaptive by maintaining cultural and social group bonds that underpin support systems for human activity. Such an external suggestive process affords social cohesion amongst humans (Schumaker, 1991a).

#### 2.1.6.2. Dissociation theories of hypnosis

A number of theories of hypnosis and hypnotizability have relied on dissociation as the mechanism responsible for responses to hypnotic suggestion. The two major theories are examined below: Hilgard's seminal Neo-Dissociation approach (e.g. 1973, 1977); and Woody and Bowers (1994) Dissociated Control theory. Each theory is presented briefly after, followed by a discussion of the experimental evidence for and against such dissociative accounts of hypnosis.

The two theories presented here both focus on a modification of the integrative conscious monitoring system, the higher-level system briefly mentioned above. Again interactions between higher-level consciousness-related systems and lower level behavioural and perceptual systems play a key part in these theories, capturing some of

the essence of Gheorgui's (1989) and Schumaker's (1991a) concepts. However, while the theories presented in this section use similar concepts to those presented above, dissociation theories of hypnosis are firmly focused on hypnotic phenomena. Such theories therefore rely on the role of a hypnotic induction to create changes in higher and lower level cognitive functioning and are more narrow than general theories of suggestion.

### Neo-Dissociation Theory (Hilgard, 1973, 1977)

Neo-dissociation theory emerged soon after the re-definition of the term 'hypnotic state' along descriptive lines. Spanos (1982) subsequently labelled the neo-dissociation approach as a 'special process theory', a pejorative term that implied the existence of a mechanism, i.e. dissociation, that was not usually present in everyday psychological processing. However, Hilgard proposed that neo-dissociation theory did not imply a special unique process and was not merely a re-working of old special state theories, rather that dissociation was an aspect of everyday behaviour and mental functioning which also provided the basis for hypnotic phenomena when manipulated through hypnotic procedures.

In relation to hypnosis, Hilgard (e.g. 1977) defined dissociation as a spontaneous process that occurs during a hypnotic induction and involves dividing the conscious mind into two separate components. The first component is a hidden or covert consciousness that is responsible for hypnotic phenomena either by manipulating voluntary action or by hiding away perception of physical stimuli as in the case of hypnotic analgesia or negative hallucination (hypnotic blindness or deafness). The second component is an overt consciousness related to what one is consciously aware of, but which remains unaware of the hidden intentional activity of the covert consciousness. Neo-Dissociation theory directly addresses a key phenomenological feature of hypnosis, namely the experience of hypnotic suggestions as involuntary. The dissociations that hypnotic procedures were described as producing led to separations between the psychological components responsible for intentionally acting out hypnotic suggestions (covert consciousness) and the monitoring systems usually responsible for awareness that the individual intentionally performed suggested actions (overt consciousness). In effect, dissociation produces the illusion that hypnotic behaviours are

acted out involuntarily by preventing awareness of the voluntary actions that lead to such behaviours.

Hilgard described the key dissociation as occurring at the level of what he called the ‘executive ego’, a central control system that usually represents the integrated planning, execution and monitoring of behaviour. A central feature of this account was that the overall cognitive system is hierarchically organised, with control systems responsible for behaviour, perception, and thought being open to manipulation, monitoring and subsequent integration into conscious awareness via the higher-level executive ego. However, the effortful maintenance of what Hilgard termed an ‘amnesic barrier’ could divide consciousness in such a fashion as to conceal a covert part of the controlling central executive allowing it to plan, execute and monitor actions outside of awareness by independently accessing lower level systems. A diagrammatic representation of Hilgard’s theory is presented in figure 2.3. (based on Kirsch & Lynn, 1998).

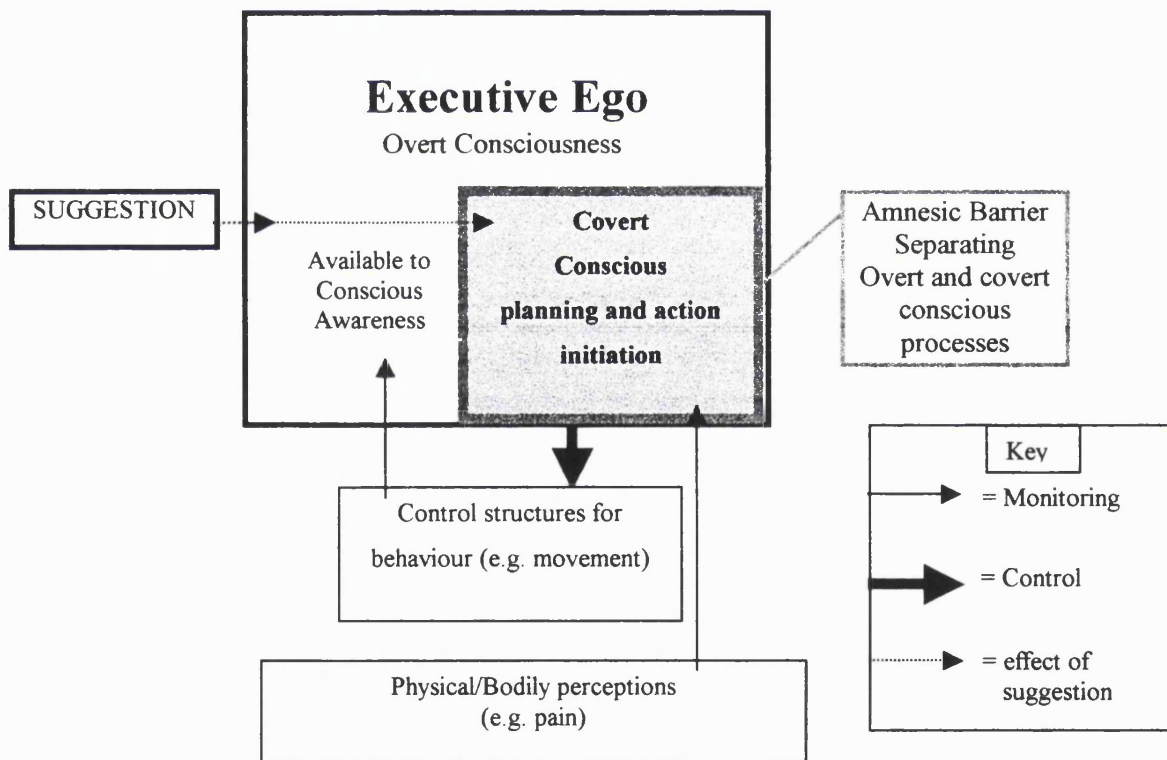


Figure 2.1. Representation of Hilgard’s (1973, 1977) Neo-Dissociation theory: A hypnotic suggestion enters Overt consciousness, but is processed by Covert consciousness which controls lower level behavioural structures and partitions off aspects of physical perception from overt conscious awareness.

Neo-dissociation theory also provides explanations for alterations in subjective experience of physical sensations, such as reduced pain perception (analgesia) or negative hallucinations (hypnotic deafness). In such cases the dissociated non-conscious or covert part of the executive ego monitors physical stimuli, but does not allow such information to pass into overt consciousness. Information about bodily states, e.g. pain, is in effect re-directed into a part of the ego that is not under overt conscious access. It is also plausible that the dissociated part of the central ego may initiate, outside of consciousness, imagined alterations in bodily sensations that are subsequently accessible to consciousness (e.g. imagining a person who isn't there, hallucinating a fly buzzing around ones head). However, Hilgard did not propose a mechanism for how this later process would occur.

#### Dissociated Control Theory (Woody & Bowers, 1994)

The Dissociated Control model of Bowers and colleagues (Bowers, 1990; 1992; Woody and Bowers, 1994) describes the effectiveness of hypnotic suggestions in terms of a weakening of central executive influence over lower level control systems, allowing the lower level systems to be activated directly by suggestions. In effect, the hypnotists suggestions during hypnosis bypass the central executive system and act directly on behavioural and perceptual systems. This approach does not require the need for the intentional activation of hypnotic responses or the assumption of non-consciously integrated intentional responses as described in Neo-Dissociation theory. In dissociated Control theory hypnotic responses are therefore described as truly involuntary.

Both Neo-Dissociation and Dissociated Control theories hypothesise that hypnotic procedures have an effect on the central executive. However, while Neo-Dissociation defines such an effect as leading to a division *within* the central executive ('horizontal' dissociation), the Dissociated Control approach describes the hypnotic induction as weakening the overall central executive. This weakening leads to a vertical dissociation *between* the lower level control structures and the central executive in which they are normally integrated. Dissociated Control discards Hilgard's concept of an amnesic barrier as too vague and does not make use of the notion of a divided

conscious executive, but retains the concept of a hierarchical cognitive system through which actions can be manipulated and controlled. The focus and type of dissociation therefore differs between the two theories, and this leads to different empirical consequences for the two theories, consequences that will be discussed in the next section.

A strength of Dissociated Control theory is its foundation (Woody & Bowers, 1994) in more recent cognitive and neurocognitive approaches to attention, strategy and the initiation of behaviour. Norman and Shallice's (1986) Supervisory Attention System (SAS), mentioned previously in section 2.1.6, features heavily in the description of Dissociated Control theory. The SAS replaces the central ego as the processor responsible for influencing and monitoring the lower level control systems (also known as schemata). The lower level systems are collectively termed as Contention Scheduling to indicate their activation is open to completion from a number of sources. The SAS is a system that moderates the activation of schemata in contention scheduling by inhibiting or exciting their activation thresholds in response to required strategic functions. In Dissociated Control terms, the hypnotic induction weakens the usual excitatory and inhibitory functions of the SAS, opening the schema in Contention Scheduling to direct (i.e. non-SAS moderated) activation from hypnotic suggestions. It is important to note that SAS is not left completely without function, it retains some degree of monitoring capacity which allows perception of the products of the Contention Scheduling system. Diagram 2.2. illustrates the basics of Dissociated Control.



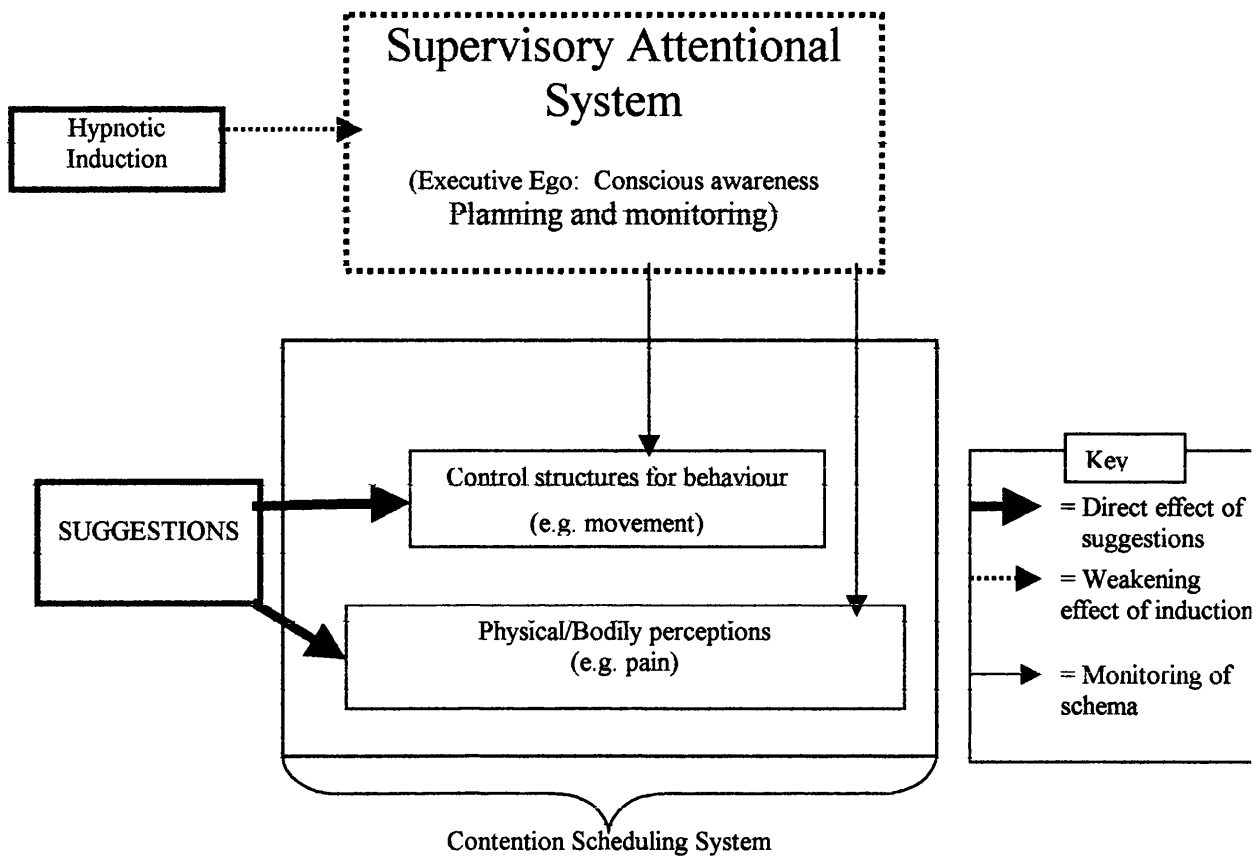


Figure 2.2. Representation of Woody and Bowers' (1994) Dissociated Control Theory.

### 2.1.6.3 Empirical evidence for the causal role of dissociation-type processes in hypnosis and hypnotic responding.

Much of the empirical evidence for the causal role of dissociation in hypnotic phenomena has focused on Neo-Dissociation theory and to some extent on Dissociated Control approaches; accordingly this section will focus on these two principle theories. This section is based primarily on Kirsch & Lynn (1998) and will examine the so-called hidden observer phenomenon that has been treated as evidence for Neo-Dissociation and the use of dual-task experiments to examine both Neo-Dissociation and Dissociated Control approaches.

#### The Hidden Observer

The earliest and most quoted evidence for dissociative-type processing in hypnotic responding came from the capacity of highly hypnotizable subjects to produce

the so-called Hidden Observer phenomena. These phenomena have been cited as direct evidence for Neo-Dissociation theory (e.g. Hilgard, 1977). Hilgard (1977) described the hidden observer as a metaphor in which a person's consciousness is divided into two different aspects: an aspect that is hypnotized, and an aspect that comments on, or observes, the activity of the hypnotized consciousness. The hidden observer phenomenon clearly illustrates the basic concept of Neo-Dissociation, i.e. that a division or dissociation of consciousness occurs as a result of hypnotic inductions, involving a part of consciousness that monitors the subjective reality of a hypnotic experience, whilst another monitors the non-hypnotic reality. In terms of Neo-Dissociation theory, the hidden observer procedure allows access to the non-hypnotized part of the executive ego, the part that fully experiences stimuli, but that is separated from awareness by the hypnotically induced amnesic-like barrier. In effect, the hidden observer allows access to the features of the mind that exemplify the underlying basis of Neo-Dissociation theory, i.e. the spontaneous division of consciousness brought about by hypnotic inductions.

Hilgard 'discovered' the hidden observer when he found that a hypnotically deaf subject (i.e. who had been given suggestions to be deaf to auditory stimuli) could experience such deafness as subjectively real, but could still respond to auditory instructions using finger signals. Other examples may be found during hypnotic analgesia, in which the hypnotized persons consciousness reports greatly reduced experiences of pain, while the hidden observer gives much higher pain ratings. The hidden observer has been demonstrated, in a number of studies, as a robust hypnotic phenomenon in high hypnotizables. The eliciting of hidden observers in high hypnotizables therefore provides evidence for Neo-Dissociation-type approaches to hypnosis, especially as in the original studies only highly hypnotically suggestive participants experienced a hidden observer.

However, the eliciting of hidden observer-type responses has been shown to be highly sensitive to instructional and contextual cues. For high hypnotizables the more explicit the instructions (e.g. Knox, Crutchfield, & Hilgard, 1975; Mare, Lynn, Kvaal, Segal, & Sivec, 1994) or the higher the task demands (e.g. Spanos, Gwynn, & Stam, 1983) for eliciting the hidden observer, the higher the actual hidden observer response rates. The reporting of the contents of the hidden 'non-hypnotized' consciousness can also differ on the basis of a change in instructional set. Spanos, Flynn, and Gwynn

(1988) demonstrated that under conditions of hypnotic blindness participants' hidden observers could be asked to report directly what they saw (e.g. the number 18 written on a page) or the reverse of what was presented (e.g. 81) simply by manipulating the instructions used. These studies imply that the hidden observer may be a construction of participants based on expectation, rather than a direct means of accessing underlying hypnotic/dissociated processes. The hidden part of a divided consciousness that should exist whenever a person is hypnotized, is not independent of instructions used to access it (Kirsch & Lynn, 1998), and hence is not a phenomenon independent of the instructions occurring after a hypnotic induction, as Hilgard suggests.

Finally, the Hidden observers have been elicited in studies where low hypnotizables (i.e. those that do not produce hypnotic responses) are instructed to simulate or pretend to be hypnotized (e.g. Hilgard, Hilgard, Macdonald, Morgan, & Johnson, 1978; Nogrady, McConkey, Laurence, & Perry, 1983). However, the response rates of simulating lows do differ from the responses of high hypnotizables in non-simulating conditions, suggesting that compliance type effects or faking *per se* do not account for the hidden observer.

### Dual Task Paradigms

Dual task studies have been used to examine both Neo-Dissociation and Dissociated Control approaches. In classic dual task paradigms two tasks are conducted simultaneously, one occurring consciously and one occurring out of consciousness. For example, an individual is instructed to engage in writing or key pressing, whilst they are also instructed to engage in another task, such as adding numbers. Participants would then be instructed to perform one of these tasks outside of conscious awareness using a hypnotic induction and hypnotic suggestions to achieve this. Both the conscious, or primary, task and the subconscious, or secondary, task, could be varied in terms of difficulty and modality used (e.g. visual, haptic, or auditory). The primary and secondary tasks could be examined for interference, usually based on number of errors, during the simultaneous task conditions compared to single task controls.

Neo-Dissociation and Dissociated Control theories imply different interference effects of a concurrent secondary. In Neo-Dissociation, there is an implied increase in interference due to an increased cognitive effort needed to create an amnesic barrier to

keep the primary task outside of consciousness, i.e. to dissociate the primary task. However, in Dissociated Control there is no need for an amnesic barrier, in fact, as the subconscious task should be activated directly as a result of suggestion *less* cognitive resources should be involved and hence less interference should be found.

Unfortunately, the findings of dual task studies have been inconsistent and inconclusive, although early findings support a Neo-Dissociation approach. Stevenson (1976) found increased interference using a difficult serial addition task and an easy colour-naming task when one was subconscious, compared to when both were carried out consciously. Exploring this further, Stevenson found that conducting the serial addition task subconsciously, using automatic writing, created greater interference in high hypnotizables when it was performed subconsciously and on its own than for simulating lows (i.e. pretending it was subconscious) under the same experimental conditions. This finding suggested that it was the apparent subconscious nature of this particular task that created errors, and not necessarily the dual task context. In a similar study Knox et al. (1976) also found increased interference in high hypnotizables when a sub-conscious key-pressing task was paired with a conscious colour-naming task.

Stevenson identified task difficulty as an important confound in determining interference. Bowers and Brenneman (1981) conducted a study on high hypnotizables using two easy tasks a number identification task as the sub-conscious secondary task and a passage-shadowing task based in a dichotic listening paradigm. Posthypnotic instructions to conduct the secondary task out of awareness led to fewer errors in the conscious task than consciously conducting both tasks, supporting a dissociated control hypothesis. However, an alternate explanation for reduced error rates was the adoption of a 'passive' response strategy in response to hypnotic task demands when conducting the secondary task. In a follow-up study, Bowers and Brenneman (1981) found that low hypnotizables adopting such a passive strategy had errors comparable to the low level found in high hypnotizables. The confound between hypnotic performance and strategic attentional set poses problems for interpretation of Bowers and Brenneman's hypnosis based interpretation of their findings.

Some support for a dissociated control approach to dual task performance has been given by Miller and Bowers (1986, 1993). In terms of attentional strategies, a study of analgesia by Miller and Bowers (1986) found that individuals adopting

hypnotic techniques did not report using purposive attentional strategies, whilst producing better pain reduction than non-hypnotic techniques. This provides indirect support for a Dissociated Control-type approach, but does not adopt a dual task paradigm and also relies on subjective reports of cognitive states, which are not always accurate (Nisbett & Wilson, 1977). In a dual-task study, Miller and Bowers' second study (1993) found that using hypnotic analgesia as the secondary or sub-conscious task paired with a complex vocabulary test led to less interference than conscious pain reduction strategies. However, hypnotic analgesia produced the same amount of test errors as pain stimulation without any form of intervention, leading to problems in interpreting the effect of the hypnotic procedures in relation to resource and interference factors.

Finally, a study by Green and Lynn (1995) found that a letter discrimination task paired with a number writing task produced findings inconsistent with Neo-Dissociation and Dissociated Control approaches. High hypnotizables made greater errors than low hypnotizables in a dual task condition using hypnosis, while high hypnotizable participants also made more errors when both tasks were conducted consciously.

In summary, the findings of dissociated-type approaches to dual task responding are inconclusive and inconsistent, and potentially incorporate a number of confounds with task difficulty and strategic attentional sets.

#### 2.1.6.4. Conclusions on dissociation theories of hypnosis.

Many of the concepts touched upon when discussing general approaches to suggestion are present in the Neo-Dissociation and Dissociated Control theory. These include the assumption of a hierarchical cognitive system and the modification of the function of so-called higher-level consciousness systems and their influence on the lower level behavioural and perceptual structures. The bypassing of some conscious monitoring is also present in both dissociation theories. Hilgard indicated that the type of dissociation he was referring to in Neo-Dissociation can occur in everyday life, but in terms of hypnotic responding it occurs as a controlled, yet spontaneous phenomenon, resulting from the hypnotic induction itself. This dissociation is hypothesised to form the causal basis for true responses to hypnotic suggestion by creating a type of dual consciousness allowing a hidden or covert consciousness to voluntarily act out

suggestions. However, as noted above the evidence for the existence of a robust form of dual consciousness is open to doubt, especially due to its modification by instruction and task demands. The assumptions of Neo-Dissociation theory in terms of dissociated task interference have also proved problematic. In addition, what has not been mentioned is the problematic nature of the so-called 'amnesic-like barrier'. This concept has lacked an adequate explanation of its mechanisms, and faces a formidable problem in that spontaneous amnesic responses tend to be very rare (Woody & Bowers, 1994; Kirsch & Lynn, 1998). This creates a problem of basing a general theory of hypnosis on a rare phenomenon that itself occurs infrequently under hypnotic conditions.

Dissociated control theory is perhaps somewhat closer to the general theories of suggestion briefly examined earlier in section 2.1.6. The concept of bypassing a 'conscious monitoring authority' (Gheorghiu, 1989) so that suggestions are more like semi-automatic acts than reasoned action is close to the tenets of Dissociated Control. However, there is little solid evidence for this relatively new approach, and despite its firm foundation in recent theories of action control and attention, it suffers from a key weakness. The key assumption of Dissociated control is the weakening of central executive function, to an extent that the authors compared hypnosis to temporary pre-frontal lobe damage. This fails to address the issue that hypnotized individuals can perform high-level executive tasks without an apparent weakening of the hypnotic experience (Kirsch & Lynn, 1998). Dissociated control may provide a good basis for future theories, but do not necessarily require the functional weakening of the higher-level executive system.

In summary, dissociation theories of hypnosis have proved to be fairly influential, but have major failings and need further empirical assessment. It is possible that dissociation is not a causal factor in hypnotic performance, but may still be a feature of such phenomena. This opens the possibility that hypnotizability and dissociation may be somewhat related, especially in terms of phenomenology, remains plausible. However, dissociation appears unlikely, at least in terms of the theories outlined above, to play a causal role in hypnotic responding. Kirsch and Lynn (1998) suggest that adopting a descriptive usage of the term dissociation appears the most pragmatic and parsimonious account of dissociation in relation to hypnotizability, suggesting that it is a factor to be explained as a result of hypnosis, and not as the basis of hypnosis itself. As a final word, the possibility is still open that a sub-set of high

hypnotizables may be adequately explained in terms of dissociated type processes where their hypnotic responsiveness may be caused by a dissociative mechanism. Section 1.2.3. of chapter 1 touched upon the relationships between hypnotizability and dissociation, and mentioned a possibility that high hypnotizables could be divided into dissociative and non-dissociative types. However, this typological approach remains to be explored further, and in any case does not impinge directly on the theories covered here that focus on unitary approaches to hypnotic suggestibility.

#### 2.1.7. Measurement of hypnotizability and dissociation: correlates, problems and insights.

There is a strange irony within hypnotizability and dissociation research, in that the gap left by a lack of coherent definitions of hypnotizability and dissociation, has been in some sense filled by supposed measures of these concepts. The irony becomes clear when one thinks of how it is possible to measure something that is not readily definable. This becomes problematic when considering what these instruments are really measuring, and how their validity can be assessed when the core concepts they are supposed to measure are ill defined. A potential advantage, or danger, is that scores on these measures become indicators of the concepts of hypnotizability and dissociation, allowing a possibility of research and development, whilst potentially posing problems in the interpretation of such scores.

An essential part of this thesis involves the use of instruments measuring hypnotizability and dissociation. The previous sections have attempted to illustrate some of the difficulties and controversies involved in defining the conceptual domains of hypnotizability and dissociation. This section addresses specific issues related to the psychometric operationalisation of hypnotizability and dissociation, and examines how quantitative approaches have helped both advance and obscure the issues raised in the theoretical discussions above.

#### The structure and analysis of hypnotizability scales.

Arguably, the greatest revolution in hypnosis research was the standardisation of hypnotizability measures, without which hypnotic responsiveness is difficult to ascertain. With the emergence of hypnotic susceptibility scales such as the Stanford

Scales of Hypnotic Susceptibility (SSHS: forms A and B; Weitzenhoffer & Hilgard, 1962) and the Harvard Group Scale of Hypnotic Susceptibility (HGSHS: Form A; Shor & Orne, 1962), concrete operationalisations were available for a broad range of hypnotic phenomena which would define the phenomena contained within the domain of hypnosis (e.g. Hilgard, 1973). However, it is important to note that the current SHSS, also known as the SHSS: form C, was modified from initial versions (SHSS:A and SHSS:B, Weitzenhoffer & Hilgard, 1963) to include a number of easier items. The initial SHSS A and B versions contained 14 hard items which generated a fairly skewed distribution relating to true hypnotic responses. The inclusion of easier items fitted in with Hilgard's (1973) conception of a bimodal distribution of hypnotizability responses, and provided a more normally distributed set of response profiles. The final SHSS:C therefore contains an implicit assumption of a bimodal distribution indicative of two kinds of hypnotic responses: true hypnotic suggestions which few people pass; and more normal suggestions which are passed by most individuals. The SHSS:C, and scales based upon it such as HGSHS: form A, therefore have explicit assumptions of different types of suggestion incorporated under the domain of hypnosis.

Item content of hypnotizability scales varies, for instance the HGSHS: form A consists mostly of ideo-motor tasks (e.g. arm levitation, hand clasp, eyelid catalepsy) and incorporates some cognitive tasks (hypnotic amnesia, positive hallucination, and post-hypnotic suggestion). More cognitive items are generally harder to accomplish, providing a more stringent test of hypnotic capacity, and are generally measured using the individually administered SSHS: form C, which involves more use of potentially 'dissociative' items such as post-hypnotic amnesia, suggestion, age regression, negative and positive hallucinations. The Harvard and Stanford scales are the more traditional and widely used tests of hypnosis and are usually the basis for validating new measures, but other tests are also popular, such as the Creative Imagination Scale (CIS: Barber and Wilson, 1978/79), and the Hypnotic Induction Profile (HIP: Spiegel 1973), a short three item test. A number of these tests have been mentioned in chapter one.

Hypnotic susceptibility tests have proved both a great strength and a potential weakness. On the one hand standardised tests have made viable distinctions between good hypnotic subjects, so called 'highs', and poor hypnotic subjects, or 'lows'. These classifications are based on an overall test score based on the sum of suggestions passed within each test. The principle behind this aggregate measure is an attempt to obtain a



rating of a person's hypnotizability over a broad range of items presumably capturing elements of the domain of hypnosis, whilst excluding phenomena outside such a domain. However, given the complexity of factors underlying hypnotic responding, it is highly likely that responding on different items represents the operation of potentially different processes, especially as assumptions of bimodal distributions have been incorporated into the original scales.

One means of determining the processes underlying hypnotic responding has been to subject such measures to factor analytic techniques. Factor analysis is a popular form of data reduction, which is also used to examine potentially separate dimensions present in a set of measures, statistically represented by the variance accountable to postulated underlying factors. However, the principle hypnosis measures used in mainstream research have a dichotomous item response format (pass/fail) which can give rise to notorious difficulties by creating spurious factor structures related to item difficulty (e.g. Carroll, 1961; McDonald & Ahlawat, 1974). In basic statistical terms, factor analysis and allied techniques such as principal component extraction, are based on the correlation/covariance matrix between scale items. When calculating correlations between dichotomous items a fundamental assumption is that each level of a particular item has the same frequency of endorsement, i.e. they are of equal difficulty. Violations of the equal difficulty assumption leads to the obtained correlation being a function of item difficulty and therefore producing factors which represent similarity in terms of item difficulty rather than some other underlying mechanism or construct. Of course, the issue of unequal dichotomy splits based on differential difficulties is an interesting one in itself, as some explanation is required of such differences in terms of item content, but it does obscure other components of interest in the scale structure.

Balthazard and Woody (1985) indicate that despite attempts to solve the issue of difficulty factors (e.g. Hilgard, 1965; Peter, Dhanens, Lundy, & Landy, 1974; Tellegen & Atkinson, 1976; McConkey, Sheenan, & Law, 1980; Sheenan & McConkey, 1982) fundamental problems persist. The closest attempt at a viable solution was examined by Tellegen and Atkinson (1976) who adopted a polychotomous, Likert type, subjective rating of difficulty, which was subsequently re-dichotomised into pass/fail format to minimise differences between item difficulty. The resulting factor solution produced two principal factors, very similar to Hilgard's (1965) solution that used a tetrachoric correlation matrix. These findings indicate that hypnotizability may not be uni-

dimensional. Hilgard (1965) suggested that in addition to an overall factor, there are three sub-factors that represent item groupings, such as challenge items, ideo-motor or direct suggestion items, and cognitive items. However, as Tellegen and Atkinson did not incorporate cognitive type items in their analysis it is only speculation that suggests a potential third factor may have been cognitive in nature.

Balthazard and Woody (1985) argue that difficulty factors are inherent in the domain of hypnotic responsiveness, and are not just artifactual statistical entities that obscure the specific content of obtained factors. Differences in item difficulty may indicate not only the breadth of individual differences within hypnotizability, but also signal further underlying aspects of the hypnotic domain. Again, the bi-modality of hypnotizability scores is a potential candidate for such differences. In addition, the application of factor analytic procedures to hypnosis scale items assumes a kind of general factor + specific factor summary, which obscures the basic component complexity underlying performance on particular, and potentially different items. As a partial resolution to these difficulties Balthazard & Woody (1992) suggest the use of a technique they named Spectral Analysis, not to be confused with the procedure used in time series analysis. Throughout this thesis the term 'Hypnosis Spectrum Analysis' will be used to avoid confusion with the original term Spectral Analysis.

Hypnosis Spectrum Analysis, which is a simplification of principles contained in the mathematically complex Item-Response Theory (Muthéns, 1978, 1984), assumes that item difficulty lies on a continuum within hypnotizability scale items. Fundamental to hypnotic spectrum analysis is the use of biserial correlations ( $r_b$ ) which are a special application of Pearson's product moment correlation ( $r$ ) using dichotomous items (the point biserial or  $r_{pb}$ ) in which the dichotomous splits are assumed to lie on a continuum. Biserial correlations between particular hypnosis scale items and an external variable of research interest can be plotted in order to identify potential trends of higher versus lower correlations indicative of the relevance of the external variable or variables to responding upon a particular item or set of items.

Studies incorporating this technique have helped elucidate the relationships between absorption (Balthazard & Woody, 1992) and non-hypnotic susceptibility (Woody, Drugovic, & Oakman, 1997), especially in relation to the two-factor model briefly described earlier. The overall findings suggest that the easier items on

hypnotizability scales, i.e. ideo-motor or direct suggestion items, are well correlated with suggestibility variables, principally placebo based suggestion (Woody et al., 1997), but poorly correlated with the harder items. In contrast, absorption appears correlated with harder items on hypnotizability scales, principally some challenge items and cognitive items such as positive and negative hallucinations (Balthazard & Woody, 1992). Though such findings suggest a two factor interpretation of hypnotizability scores based on suggestibility and absorption, which supports the theoretical relationships suggested in the previous sections, a recent study has failed to replicate the original Hypnosis Spectrum Analyses (Kirsch, Comey, Silva, & Reed, 1995).

### The structure and analysis of dissociation scales.

The Dissociative Experiences Scale (DES, version 1: Bernstein & Putnam, 1986; and DES version 2 or DES II: Carlson & Putnam, 1993) is considered by many researchers in the area as the gold standard of dissociation measures. Initially, the DES was constructed as a measure of the continuum of dissociation, spanning aspects of normative and pathological related dissociation. This perspective falls within a quantitative view of dissociation that goes against Janet's (1889) conception of dissociation as a pathological discontinuity from normal experience. However, a number of researchers, supported by factor analytic methods, argue that dissociation can be seen as representing different types or kinds of dissociative experiences.

Factor analysis using clinical populations has generally defined three sub-scales based on amnesic dissociation, absorption-imaginative involvement, and depersonalisation/de-realisation. In clinical samples the three factor solution has been readily replicated, with small degrees of variation on the specific item loading (e.g. Carlson, Putnam, Ross, Anderson, Clark, Torem, Coons, Bowman, Chu, Dill, Lowenstein, Braun, 1991), with amnesia being the principle factor, followed by absorption/imaginative involvement, and finally depersonalisation/de-realisation. Confirmatory factor analytic techniques have supported this structure (Schwartz & Frischholz, 1991). These findings suggest the existence of different types of dissociation, rather than one unitary overarching continuum.

There has been, however, some controversy over the factor structure of the DES in non-clinical populations, with only some studies reproducing the three factor solution

(e.g. Carlson, Putnam, Ross, Anderson, Clark, Torem Coons, Dill, Lowenstein, & Braun, 1993; Ross, Joshi, & Currie, 1991) with some variation in item loading and differences in variance accounted for by the principle factors. In the non-clinical samples absorption and changeability appear as a principle factor, followed by depersonalisation/derealisation, then a smaller amnesia factor. One studies found as many as seven factors (Ray, June, Turaj, & Lundy, 1992) though this factor solution may have been due to an alternative item scoring format. Waller (1993-cited in Carlson & Putnam, 1993) has suggested that excessive item skew in the DES may create spurious factors, and demonstrated that correcting for skew produced only a one-factor solution. Fisher and Elnistky (1990) originally found the one factor solution for the DES, which they suggested represented a cognitive orientated factor.

The extent to which the DES, and dissociation as a concept, represents one dimension or multiple dimensions is still debated, and reflect the themes discussed earlier. However, recent research (Waller, Putnam, & Carlson, 1996) has used the DES to identify two types of dissociators: a) individuals who are prone to developing pathological dissociative features, and b) individuals who express non-pathological absorption/imagination related phenomena. The initial findings using advanced techniques for uncovering typologies from non-discrete dimensional constructs has provided evidence that the DES II contains both a dimensional, trait-like component related to non-pathological dissociation, and a pathological dissociative taxon representative of a membership of a latent class variable indicating the experience of chronic pathological dissociative states (Waller et al, 1996; Waller & Ross, 1997). The possibility that dissociation, is actually a dimensional and taxonomic construct is important as which of these features of dissociation relates to particular research questions needs to be assessed. This can be done especially using the DES via a sub-scale intended to measure taxonomic membership, the DES-T, which consist of 8 items from the DES, the rest measuring a non-pathological dimensional construct. Waller and Ross (1997) found that the DES-T has extremely 'J' shaped skew and kurtosis, with this partly adding to skews and kurtosis in the overall DES. When the DES-T is removed the DES skew and kurtosis is reduced, resembling a truncated normal distribution.

The Perceptual Alteration Scale (PAS: Sanders, 1986) is another scale of dissociation, that was developed at the same time as the DES, using items from the Minnesota Multiphasic Personality Inventory (MMPI) which were most related to

Hilgard's (1977) description of dissociation. A sub-set of items focuses on modification of regulatory control, changes in self-monitoring, concealment from others, and alterations in consciousness. Other items included by Sanders examined perceptual and affective modifications. An initial factor analysis of the PAS revealed three factors: modification of control, modification of cognition, and modification of affect. Levels of correlation between the PAS, measures of self-esteem, and negative mood ( $r = -0.54$  and  $r = .45$ , respectively, Sanders, 1986) suggested the scale may be more related to affective components of dissociation, an issue which may identify a potential confound with elements of affective disorders. The PAS has not been widely used, perhaps due to potential contamination with affective reactions that reduce its discriminatory validity. However, the PAS did successfully distinguish between non-binge and binge eaters in a normal college population (Sanders, 1986), and has been used alongside the DES in examining disordered eating in college students. However, interpretation of these correlations requires caution due to an alternative confound with state/trait levels of affect.

Whilst the original factor analysis of the PAS identified three factors forming the basis for three separate sub-scales referring to dissociation of control, affect, and cognition (Sanders, 1986) the factors have not been replicated by subsequent researchers (e.g. Fischer & Elnitsky, 1990). In fact, the PAS appears to define a uni-dimensional factor related to affective dissociation (Fischer & Elnitsky, 1990).

Other scales have been constructed for the measurement of dissociation, (e.g. the Dissociation Questionnaire: DIS-Q, Vanderlinden et al., 1993). The DES II and PAS are considered in detail here as they have been used previously in non-clinical research into disordered eating (e.g. Rosen & Petty, 1994; Valdisseri & Kihlstrom, 1995a, 1995b; Frasquilho & Oakley, 1997). The DES and PAS are therefore the two measures of dissociation used in the empirical work in this thesis as they putatively capture cognitive and affective elements of dissociation potentially relevant to understanding relationships with disinhibited or binge type eating.

It should be mentioned that the last section of this chapter briefly re-caps on the measurement issues covered here, and provides some basic psychometric information relevant to the empirical usage of the scales mentioned above.

### Dissociative correlates of hypnotizability.

An early study (Nadon, Kihlstrom, Hoyt &, Register 1991) using the DES found significant yet low correlations with the HGSHS:A ( $r = 0.14$ ,  $p < 0.05$ ). Frischholz, Braun, Sachs, Schwartz, Lewis, Shaeffer, Westergaard, and Pasquotto (1992) found similar correlations between the HGSHS:A, the DES total score ( $r = .12$  at  $p < 0.05$ ), and the absorption sub-scale of the DES ( $r = 0.13$ ,  $P < 0.05$ ). Frischholz et al. also found that the number of items recalled during an hypnotic amnesia correlated negatively with the total DES score ( $r = -0.19$ ,  $p < 0.001$ ), dissociative amnesia ( $r = -0.16$ ,  $p < 0.01$ ), depersonalisation/de-realisation ( $r = -0.21$ ,  $p < 0.001$ ), and absorption ( $r = -0.12$ ,  $p < 0.05$ ), indicating that decreased recall for items (i.e. increased amnesia) is related to multiple aspects of dissociation. In another study, Faith and Ray (1994) found no significant correlations between the DES and the HGSHS:A. A study by Oakman, Woody, and Bowers (1996) did find significant but again low correlations between the DES and the HGSHS:A ( $r = .27$ , and  $r = .21$  in or outside hypnotic contexts respectively,  $p < 0.05$  for both). As an aside, this finding suggests that context effects do not influence, i.e. elevate or deflate, correlations between the DES and hypnotizability as measured using the HGSHS:A, and also indicates that waking suggestibility measures also seem to have some relationship with dissociation. Butler & Brynat (1997) also found very similar correlations to Oakman et al..

Using an alternative scale of dissociation, the PAS, Torem, Egtvedt, and Curdue (1995) found a strong correlation of with the eye-roll component of the Spiegel Hypnotic Induction Profile (HIP: Spiegel, 1973). As the eye roll is seen as a potential physiological measure of hypnotic/dissociative capacity, Torem et al. suggest that the PAS may be measuring physiologically related features of dissociation and hypnosis. However, this claim remains to be further substantiated.

Unfortunately, few of these studies examined differential correlations between DES and different items on the hypnotizability scales, with the exception of Torem et al. (1995) who found the highest correlation using a component (eye-roll) of the HIP and Frischholz et al. (1992) who examined amnesia responses. Lack of item-by-item correlations may obscure latent relationships present between scale items and DES scores, with the potential that dissociation is more relevant for performance on harder

rather than easier items, as suggested by two factor models. However, studies that did use item-by-item analysis have failed to demonstrate high correlations between dissociation and the harder items on hypnotizability scales (e.g. Kirsch, et al, 1995). These findings tend to suggest that dissociation and hypnotizability are not generally well correlated, or correlate to a minor degree.

2.1.8. The Socio-Hypnotic Approach: Complex components, incompatibility with dissociation theories of hypnosis, and implications for the restraint and disinhibition of eating.

In chapter one, mention was made of a Socio-Hypnotic view or approach to understanding certain features of eating behaviour. This approach originated mostly from the work of Groth-Marnat & Schumaker (1991), Covino et al (1994), Wybraniec and Oakley (1995), and Frasier & Oakley (1996). The following sections attempt to clarify the basic features and components of the Socio-Hypnotic framework. Having stated the reasons for introducing the Socio-Hypnotic approach, the theoretical orientation and possible the components of such an approach are examined below.

2.1.8.2. The theoretical focus of the Socio-Hypnotic Approach

In general, the Socio-Hypnotic approach states that the effectiveness of a suggestion is mediated by a number of factors that interact with each other in a specific context. Some of these mediating factors may augment or reduce the impact of a suggestion. Others factors, including context, may moderate the interaction between two or more mediating factors. The Socio-Hypnotic approach is employed as a theoretical justification for hypothesising correlations between hypnotizability and features of eating that may be open to social influences; specifically features such as concerns related to dietary restraint. However, the Socio-Hypnotic approach does not refer to any one theory in particular. Rather, it is a heuristic term for a combination of approaches that focus on hypnotic suggestibility as a form of social interaction very similar to the suggestive interactions occurring in non-hypnotic or so-called waking contexts. More precisely, a fundamental feature of the Socio-Hypnotic approach is that the same psychological components influence levels of suggestibility in both hypnotic and waking contexts. Hypnotizability scales are interpreted in terms of the Socio-Hypnotic

approach as being in part or in whole complex measures of various factors that combine to produce increased receptivity to social influence.

The simple position at the core of the Socio-Hypnotic approach is that high levels of hypnotic suggestibility, or imaginative suggestibility as Kirsch calls it (1997), predict high levels of waking suggestion, i.e. responsiveness to everyday suggestion. This position appears to make hypnotic and waking suggestibility identical, however, they are not necessarily the same given that the contexts in which suggestions are presented do differ between waking and hypnotic situations. However, previous studies have found levels of responsiveness to waking and hypnotic suggestions to be very highly correlated (Hilgard, 1965).

Another important feature of the Socio-Hypnotic approach is the way in which the terms ‘hypnotic’ and ‘waking’ suggestibility are used purely descriptively. ‘Hypnotic’ suggestions indicate that the suggestions were administered within the context of a hypnotic induction. In contrast, ‘waking’ suggestions are not administered within formalised procedures for establishing a hypnotic induction. The descriptive usage of these terms is aimed at keeping close to the APA’s statement on hypnosis, as introduced in section 2.1.2. of this thesis, and to emphasize the purely procedural difference between the framing of ‘hypnotic’ and ‘waking’ suggestions.

This descriptive use of ‘hypnotic’ and ‘waking’ goes counter to the more traditional State or ‘Trance’ approaches to hypnotic induction. State approaches use the term ‘hypnotic suggestibility’ as a means of identifying the presence of a so-called ‘Trance’ state that has unique explanatory properties that differ from the properties of waking or non-hypnotic suggestibility. These semantic issues have already been touched upon in section 2.1.2, but they emphasise the differences in assumptions between the Socio-Hypnotic approach and other views of hypnotic suggestibility and help locate the Socio-Hypnotic approach within the hypnosis literature. The Socio-Hypnotic approach is firmly embedded in non-state frameworks of hypnosis. These frameworks generally agree that hypnotic effects can be produced outside of hypnosis, i.e. in waking suggestibility contexts. As already mentioned above, this approach has been supported by the very similar level of responsiveness to identical suggestions in hypnotic and waking contexts (Hilgard, 1965).



Also mentioned previously, (section 2.1.2), non-state or social psychological approaches (e.g. Kirsch & Lynn, 1995) focus primarily on the expression of hypnotic and waking suggestibility as a result of a person's abilities, beliefs, and interpretations of the suggestion and suggestive context. However, there is a fair deal of disagreement as to what common psychological processes are responsible for both hypnotic and waking suggestibility. The general debate has been over which process or processes are more predictive. There is no need to discuss the relative merits of each of these positions in order to outline the Socio-Hypnotic approach; to do so would be a major endeavour in-itself. It is sufficient to outline a general framework for understanding the processes involved in the Socio-Hypnotic approach and to focus on a set of candidate components that may explain how hypnotic and waking suggestibility may relate to clinical and non-clinical dieting concerns. These factors form the basis for the components of Socio-Hypnotic that may be appropriate to understanding suggestibility influences on the formation of dieting concerns in non-clinical and clinical populations.

#### 2.1.8.3. Components of the Socio-Hypnotic Approach.

The aim of suggestive communication is to influence an individual, a group or a society to engage in the content of a suggestion. This is a rather simplistic, but none-the-less fair view of the nature of suggestion (Schumaker, 1991b). In terms of the Socio-Hypnotic approach, a hypnotic or waking suggestion is an attempt to promote a form of social influence over a person. This assertion originates from the basic theoretical background of non-state approaches to hypnosis. The factors that may affect the social influence of suggestions are numerous, but the main components examined here are: compliance and belief, the role of personality traits and the capacity to utilise particular cognitive aptitudes (such as imaginative capacity and the control of attention). These components have been chosen as they may also fit in with the formation of eating concerns, as will be discussed shortly.

#### Compliance and Belief.

A good template for the components of the Socio-Hypnotic approach is outlined in Wagstaff's (1991) compliance theory of hypnotic responding. In his theory, Wagstaff's rejects the concept of hypnosis as an altered state of consciousness as un-parsimonious and misleading, and implies that everyday normal individuals do not

generally experience radical subjective effects such as controlled hallucinations, unbreakable amnesias or posthypnotic suggestions. Instead, Wagstaff offers a theory based on belief, strategy and compliance.

In Wagstaff's theory, hypnotic suggestibility can be conceptualised in terms of a sequence of psychological processes involving expectation/belief about the hypnotic situation, strategic attempts to subjectively experience hypnotic effects, and finally compliance when subjective hypnotic experiences do not occur. An individual's subjective experience of a hypnotic suggestion is judged in terms of the expectations arising from the hypnotic situation and the individual's own beliefs about what constitutes hypnotic experiences. A hypnotic response is 'genuine' in as far as it based on actual experiences seen as congruent with expectations of hypnosis. For example, an individual may expect a hypnotic hallucination to be the same as imagining an object in their mind, and hence they act in a genuine fashion when they report that they are hallucinating. However, another individual may believe that hypnotic hallucinations constitute the appearance of an actual object in the world, but fail to experience that object. When actual experiences are not deemed indicative of what a person believes constitutes a hypnotic effect that person may none-the-less 'fake' the response or verbal report to fall into accord with what they think a good hypnotic subject should report. This faking may be an attempt, according to Wagstaff, to demonstrate a person is a good hypnotic subject and therefore either please the experimenter and/or satisfy the persons need to feel they are competent in the eyes of the experimenter.

Wagstaff's compliance and belief model, however, tends to overemphasize the likelihood of compliance or shaming behaviour. A number of non-state theorists deny that hypnosis is all compliance, and have demonstrated that even when compliance is facilitated or accentuated faking is not always the result (e.g. Spanos, 1991). Adopting low hypnotizables simulators to fake hypnosis leads to different profiles of responding to high hypnotizables who are not instructed to fake (e.g. Spanos, 1991; Kirsch & Lynn, 1995) indicating that different processes may be applicable to the different response profiles. It is clear that hypnotic participants are mostly trying to achieve a hypnotic experience, and this is where the role of so-called personality traits and the capacity to utilize certain cognitive attitudes play a role.

None-the-less compliance remains a plausible component of the Socio-Hypnotic approach, especially as it focuses on the reasons why individuals will go along with a suggestion in terms of maintaining a positive self-image. Wagstaff (1991), citing evidence from Orne (1962), suggests that given the appropriate contexts people will comply with the most extreme and at times disagreeable requests in order to appear as 'good subjects' for the experimenter. Beyond the hypnotic context, there may be a possibility that some of the features that underlie compliant behaviour may predispose certain individuals to comply with suggestions in a wider variety of contexts.

Some evidence has suggested that sub-groups of eating disordered individuals may be pre-occupied with their social self-image and become predisposed to express a false self-image in order to obtain positive recognition and evaluation from others (Striegel-Moore, Silberstein, & Rodin, 1993). One tentative explanation for the higher levels of hypnotic suggestibility found in bulimics, as reviewed in chapter 1, may be due in part to compliance behaviour directed towards being a good hypnotic subject. In effect, this compliance hypothesis proposes that the features promoting compliance in everyday life may also account for greater levels of reported suggestibility in hypnotic contexts.

However, it must be noted that compliance is a behaviour motivated by a number of factors, and in terms of Wagstaff's model it is motivated by either a lack of the subjective experience of expected hypnotic effects and/or an overarching desire to appear favourable to self and others. The motivation to present a favourable or social desirable self-image, which may be an enduring individual difference, may underlie both hypnotic and waking suggestibility in some individuals, but some individuals may be able to experience certain hypnotic effects and not rely on compliance at all. This is especially important as compliance cannot easily explain differences between simulating participants and non-simulating participants. The strategic components of the Expectation-Strategy-Compliance model cited above may involve complex interactions between context demands and features of a persons cognitive capacities and aptitudes. It is argued below that such interactions and cognitive features may not only help in the experience of specific hypnotic effects, but also help augment suggestibility in general.

## Personality Traits and Cognitive Aptitudes

The hypnosis literature is full of attempts to identify consistent correlates between high levels of hypnotic suggestibility and personality traits or information processing capacities. In general, the search for personality correlates of so-called hypnotic ability has been inconsistent and inconclusive (deGroh, 1992). Candidate personality traits such as dissociation and imaginative involvement have failed to establish strong and robust correlations with hypnotizability. However, most of these features, specifically dissociation and imaginative involvement, demonstrate a so-called fan-shaped distribution with hypnotic suggestibility. The fan-shaped distribution describes a patterning of responses where low suggestibility is associated with low levels of the personality trait in question, whilst high levels of suggestibility are associated with either low or high levels of the trait (for review see deGroh, 1992). The emergence of a fan shaped distribution presents an interesting theoretical possibility. It implies that lack of a the particular personality trait is associated with low hypnotic suggestibility, whilst for some high hypnotizables the personality trait is present at high levels possibly indicating that such traits may be important for producing hypnotic responses in certain individuals but not others. However, given the correlational nature of such findings, the actual of association between apparent traits such as dissociation and imaginative involvement remains a theoretical enterprise.

The relevance of dissociation as a causal factor in responding to hypnotic suggestion has been addressed in a previous section (2.1.6.3), and remains poorly supported in non-clinical samples. However, imaginative capacity as the ability to generate and become involved in imagery presents itself as a possible component of the Socio-Hypnotic approach. It is especially important to explore such a component as certain measures of hypnotic suggestibility, such as the Creative Imagination Scale (CIS: Wilson & Barber, 1978/9) used later in study 1, rely heavily on imagery related suggestions. The CIS also uses explicit instructions for the active involvement in the suggested content.

### Imagery involvement.

In an early review of the imagery literature, Sheehan (1979) identifies the role of imagery in hypnotic suggestibility as complex and the evidence for a relationship with

hypnotic suggestibility suffers as a result of a variety of factors. These factors include different ways in which imaginative capacity and imagery are defined and measured, and also how different measures of hypnotizability place varying emphasis on imagery related processes. Even within the same measure of hypnotic suggestibility different processes may be relevant to the passing of various suggestions, especially given the multidimensional complexity of processes involved in eliciting responses to different suggestions items (see section 2.1.2 and 2.1.7). Another important factor is that imagery on its own may not be very predictive of hypnotic suggestibility; rather imagery may interact with what Sheehan calls conjoint factors to produce hypnotic responses.

The above difficulties aside, Sheehan provides a workable hypothesis for how a capacity to evoke imagery may be important in both hypnotic and waking suggestibility. This theory fits in well with non-state views and provides a means of understanding how imagery may be another component of the Socio-Hypnotic approach. Sheehan defines imagery as an introspective means of talking about an object that is not there. The imagery gives a subjective internal impression that an object or scene is actual present and is being 'seen' or 'pictured', when it is not actually present in reality. The better the imagery the better the 'thing-like quality' (sic Sheehan, 1979) of the experience.

For Sheehan, imagery and imagining allows a person to act out a hypnotic role 'as-if' they are experiencing a real perceptual or behavioural stimulus, or that 'previously experienced situation were now current' (Sheehan, 1979). The essence of this approach is that the person is pretending to report on an imagined situation as if it were really perceived. The better a person can image the situation, the more convincing it is to themselves and others that they are acting 'as-if' the imagery were real.

In his review, Sheehan did not provide much empirical support for his as-if role-play related approach; instead it was adopted as a useful means of understanding how imagery may interact with hypnotic suggestibility. The role of imagery applies to suggestion in both waking and hypnotic settings, and this makes it an applicable component in terms of a Socio-Hypnotic approach. It is important to note, however, that Sheehan's approach is not simply identical to compliance, as the imagery provides a subjective experience upon which a role enactment is based, which contrasts with

simple shamming in Wagstaff's (1991) terminology that implies the lack of a specific subjective experience. Some elements of compliance may be related to as-if imagery. A tendency to adopt 'as-if' approaches to specific roles may relate to a desire to be positively evaluated by others, a feature that overlaps to some extent with the notion of compliance as detailed in the previous sub-section. However, a capacity to image realistic situations and interact with such imagery may help a person enact the content of a suggestion, or experience the associated affects of a suggestion as if the suggested content were realistic to some extent.

Crawford, (1996) in a recent review of imagery capacity in relation to hypnotic suggestibility has suggested that imagery is complexly inter-related with a number of cortical and sub-cortical neurological centres related to attention and perceptual activation. One possibility emerges that imagery activation may be associated with activation of various systems in both cerebral hemi-spheres related to perceptual and memory based processing. If such a situation is possible, then a capacity to generate imagery may not only link into creation of realistic 'as-if' representations, but, as suggested above, help trigger memory related factors that further aid in the motivational and strategic features of performing and/or experiencing suggestions. However, the issues and evidence are complex and still under debate, awaiting further neuropsychological investigation.

### The regulation of attention

A final potential component of the Socio-Hypnotic approach is based again on the cognitive aptitudes related to the strategic enactment of suggestion, and this is the control of attention and the activation of automatic behaviour. In an earlier section, Dissociated Control theory was assessed as a possible dissociation theory of hypnosis. In that section the evidence for Dissociated Control theory was demonstrated to be poor. However, some cognitive capacity to control attention and/or establish different types of attentional activity such as focused and sustained attention, may be beneficial in executing suggestions in hypnotic and waking situations.

Crawford and colleagues (Crawford & Gruzelier, 1992; Crawford, Brown, & Moon, 1993; Crawford, 1994;) propose that high hypnotizables have greater sustained attentional and dis-attentional capacities, which may contribute to their good hypnotic

responsiveness. The basis of this view is that an ability to maintain focus on the content of a suggestion prevents distraction or potential cognitive interaction from other sources of information. The capacity to adopt different information processing strategies may help suggestive influence primarily by reducing competing activation from sources that may prevent enacting out a suggestion (e.g. Cardeña & Spiegel, 1992). This is similar to Gheorgui's (1989) concept of bypassing the conscious monitoring authority, with increased absorption in a suggestion preventing higher-level rational systems from preventing censoring of suggested actions. As noted earlier, there is some degree of overlap here with features of dissociation-based theories of hypnosis. However, the essential issue is that the attentional features discussed above are not part of an overarching theory of suggestibility; they comprise one factor that may facilitate suggestion, rather than form the basis of an overarching theory for all suggestion.

The 'as-if' formulation of imagery involvement, the possible activation of memory and perceptual systems through imagery, and the role of attentional factors, may all play a role, amongst other factors, in setting up the conditions to act out suggestive communications. In effect, these features may interact with each other in complex ways in order to set up the basic cognitive strategies that may lead to the successful experience of suggested content. In relation to the issues outlined in this thesis, the above cognitive components may also be involved in motivations surrounding responding to social suggestions related to eating and body image concerns. For example, a possible pre-disposition to engage in body image and weight concern motivated cognitions may open certain individuals to recurrent concerns and behaviours that underlie aspects of clinical and non-clinical eating attitudes and behaviours. Such a pre-disposition can be traced, in part, to the imagery components of the Socio-Hypnotic approach and their interaction with belief and possibly motivation to comply with pervasive incentives to engage in restraint related concerns and behaviours.

Attentional features may also play a role. Kaffman (1992) suggests that eating disorders such as anorexia nervosa are examples of Mono-Ideaistic disorders, characterised by an intensive fixation on a limited set of cognitions and beliefs. Such a fixation prevents a reasoned approach to the fixated and narrow belief system, preventing positive cognitive change away from the problematic cognitions and related behaviours. Although a tentative hypothesis, the role of focused attention on a limited ideational content may help maintain a circumscribed set of eating attitudes and

behaviours that are maladaptive, while the basic cognitive processes involved may be located on a continuum with processes that help establish high levels of responsiveness to suggestion.

### Summary of the Components of the Socio-Hypnotic approach.

This section has gone beyond the general features of hypnotizability scales as measures of suggestion, and introduced the possibility that these measures involve similar features that promote suggestibility in hypnotic and waking contexts. Compliance may well play a major role in hypnotic and waking suggestibility, with this being allied to possible concepts relating to conformity and social pressures. The earlier relationship between hypnotic suggestibility and performance on the Asch conformity paradigm (Shames, 1980, see section 2.1.3) supports this position. The importance of belief and how this interacts with a number of the Socio-hypnotic components has also been outlined. The role of belief is fundamental in determining expectations and motivations to enact suggestions, or be affected by suggestive communications. Imagery and attention have also been examined as features that not only facilitate hypnotic suggestibility, but also may play a role in facilitating suggestions not presented in a hypnotic context. It is important to note that hypnotic suggestions, with their focus on ideo-motor and challenge items, appear radically different from the sometimes vague and pervasive social suggestions that are present in everyday life. However, despite apparent differences between the types of suggestion inherent in hypnotic and everyday contexts, the Socio-Hypnotic approach attempts to demonstrate that some common elements will predict suggestibility in both contexts. This is the starting point for making sense of the findings discussed in chapter 1 in relation to the possible symptom formation role of suggestion in clinical (Covino et al, 1994) and non-clinical problematic eating (Groth-Marnat & Schumaker, 1990).

The implicit theory of social influence used to integrate the various components of the Socio-Hypnotic approach is based on McGuire's (1989) Mediational Theory of social influence. In this model, responsiveness to social influence, defined in terms of either tendency to comply or persuasion, is mediated by a number of inter-related variables. The extent to which any one variable affects net social influence depends on how it affects other mediators; i.e. how it interacts with those mediators. Some variables combine to increase the likelihood of net social influence, while others are in



opposition. At the same time, situations or contexts will weight the relative impact of each mediating variable, with different contexts producing different weightings. McGuire's model is similar in nature to Wagstaff's ESC (expectation-strategy-compliance) approach, and provides a good general framework in which ESC can be incorporated. Although McGuire focuses on the end net product of social influence in terms of compliance and persuasion, his model can be modified slightly to incorporate cognitive factors relevant to the subjective experience (i.e. the strategic components) and honest reporting of hypnotic experiences. Imagery capacity and focused attention may promote certain types of suggestive communication, especially those not requiring rational processing in order to be enacted or experienced.

To conclude, in terms of the issues examined in this thesis, the same cognitive aptitude components, imagery, perceptual and memorial activation and attentional narrowing can be incorporated as mediators in the process of social influence in addition to a tendency to comply. It is important to mention here that the end product in this mediational model is the actual enactment or experience of a suggestion. For example, successful behavioural or verbal report of a suggested experience may result from compliance in the absence of a subjective experience (Wagstaff, 1991), or truthful belief moderated reporting and a behavioural or emotional reaction to a suggestion that drives or manipulates ones everyday behaviour along the lines of that suggestion, 'i.e. to imagine oneself as being be thinner'. The specific role of an overall model of Socio-Hypnotic processes in the potential influence and regulation of eating concerns is outlined in the next few major sections, after a discussion of the incompatibility of the Socio-Hypnotic approach and Dissociation theories of hypnosis.

#### 2.1.8.4. Socio-Hypnotic Approach versus Dissociation Theories of hypnosis.

As a final section to this examination of the Socio-Hypnotic approach, there needs to be some discussion of the incompatibilities between this approach and those based on the previous section examining Dissociation theories of hypnosis. An initial incompatibility between Socio-Hypnotic type approaches and dissociation theories originates in the state vs. non-state debate. This is especially relevant in order to separate dissociation approaches to hypnotic suggestibility that have been cited in relation to the experiences of eating disordered individuals (e.g. Pettinati et al, 1984),

and studies that have not supported the involvement of dissociative processes in the hypnotizability of eating disordered groups (e.g. Barabasz, 1991).

The Socio-Hypnotic originates from non-state type perspectives that interpret hypnotic responses as resulting from social psychological factors surrounding the hypnotic situations and not from special processes unique to the hypnotic situation. Dissociation type theories vary from state related alterations in conscious processing, such as in Dissociated Control theory, to theories such as Neo-Dissociation which appear as state based theories, but are presented as theories of normal everyday functioning. In these definitions, 'state' has been variously used as either a strong explanatory term or as a weaker descriptive term (see section 2.1.2).

The dissociation theories examined in this thesis (Neo-Dissociation and Dissociated control: see section 2.1.6.2) can be variously described as state approaches in both weak and strong terms. However, both theories define an alteration in the normal functioning of cognitive systems due to a hypnotic induction, either as a divided consciousness or weakened executive functioning, and therefore account for differences in hypnotizability as a function of the capacity to bring about such changes. To be hypnotized requires an individual to experience potentially radical changes in their conscious processing. The Socio-Hypnotic type approaches do not require an individual to exhibit a particular change in cognitive functioning during hypnosis. A strong version of this hypothesis is that hypnotic suggestibility is equivalent to everyday waking suggestion, i.e. the presence of an hypnotic induction does not alter responses to suggestion by virtue of its modifying of normal cognitive functioning. Hypnotic inductions have been documented to modify responsiveness to suggestion by a small, but consistent degree (e.g. Kirsch, 1997), however, these change may be the result of changes in expectations relating to responding to suggestions defined as hypnotic (e.g. Kirsch, 1997; Wagstaff, 1998).

Proponents of dissociation type approaches have argued, especially Hilgard (1977) that the changes occurring during hypnosis as a result of dissociation also occur in everyday life. This approach maintains the concept of the importance of dissociative processes, but escapes an altered state description by indicating that such states occur in everyday life. However, as argued in section 2.1.6.3, there is little evidence for a Neo-Dissociation approach, and such an approach also relies on a phenomenon that is rare in

everyday life, i.e. the occurrence of spontaneous amnesias, and hence does not fit in well with Socio-Hypnotic approaches.

A second and fundamental incompatibility between the Socio-Hypnotic approach and dissociation theories of hypnosis, is recognition of multiple processes responsible for hypnotic suggestibility. Dissociation-type theories appear to rely on one principle process to describe and explain the trait-like phenomena of hypnosis. However, this fails to appreciate that hypnosis is not a phenomena that has one simply underlying trait responsible for its expression, rather it is a multi-dimensional construct made up of different interacting components. This multi-dimensional approach has been supported by a failure to find consistent correlations between hypnotic responding and other factors, including dissociation (deGroh, 1992; also see section 2.1.7). These problems are compounded by the possibility that different items in hypnosis scales belong to different items populations that correspond to different types of response profiles (e.g. Woody, 1997; see section 2.1.7). A multidimensional definition of the processes involved in hypnosis is more appropriate in terms of theory and measurement. Features related to dissociation, such as attentional regulation, may play a mediating or moderating role in the outcome of suggestion, but not as fundamental overarching causal principles that exist in isolation.

A central feature of this thesis is exploring possible relationships between hypnotic suggestibility and aspects of dietary restraint and related concepts. A second issue fundamental to this thesis is the extent to which dissociation appears related to aspects of disinhibition. If hypnotizability and dissociation are not as well related as previous approaches would suggest (e.g. Pettinait et al, 1984), then they may have different influences on the aspects of eating examined in this thesis,; primarily dietary restraint and dietary disinhibition. The concepts of dietary restraint and dietary disinhibition are closely related, as will be seen in the subsequent section. Chapter one reviewed a number of studies identifying relationships between hypnotizability and dieting concerns, as well as between dissociation and a number of problematic eating concerns and behaviours. If such hypothesised relationships are found then interpretation of these will involve interpretation of hypnosis and dissociation theories and how such theories relate to the measurement of such concepts. A focus of this thesis is on the capacity for individuals to respond to suggestions, and the influence such a capacity may have on other factors related to eating concerns. As hypnotizability and suggestion are complex

phenomena, subsequent research may narrow the focus upon which factors are and are not related to the variables of interest.

It is first important to determine if relationships between hypnotizability, dissociation, and concepts related to restrained and disinhibited eating are robust, in addition to identifying if hypothesised relationships hold with potentially different types of eating concerns and behaviours. The findings that hypnotizability and dissociation are relatively unrelated or only related to a minor degree, opens a possibility that they may differentially relate to aspects of dietary restraint and disinhibition. Before examining these issues further, it is important to define what is meant by dietary restraint and disinhibition, and chart out the potential relationships between these concepts, and how such relationships can be measured.

## **2.2. The constructs of dietary restraint and dietary disinhibition.**

As mentioned above two key concepts in this thesis are restrained eating and the contrasting concept of disinhibited eating. Non-clinical studies reviewed in chapter one identified potential relationships between measures of hypnotizability, or measures predictive of hypnotizability, and measures of restrained eating and dietary restraint concerns. Other studies found disinhibited type eating behaviours and concerns, including bingeing, to be potentially related to dissociation. This section examines the complex constructs of dietary restraint, or restrained eating, and disinhibition of restraint, and how they have been measured. It also examines in more detail issues raised in chapter one concerning how such concepts may relate to hypnotizability and dissociation.

Restrained and disinhibited eating occupy related niches within complex models of eating attitudes and behaviours which incorporate complex relationships with other factors such as social pressures based around body aesthetics, body dissatisfaction, and potential types of clinical eating difficulties. While such models are not directly addressed in this thesis, a potential version of such a model (Stice, 1994) is illustrated in later sections as it provides as a good background for the potential relationships examined within this thesis.

### 2.2.2. Origins of the restrained eating construct and a word of caution about the use of terms 'dietary restraint', 'restrained eating', and 'dieting'.

The concept of restrained eating, often referred to as dietary restraint, originated from attempts to define the physiological and psychological determinants of eating behaviour in obese individuals evolving initially from two psycho-biological perspectives within obesity research: Schacter's externality theory (1971); and Nisbett's homeostatic set point theory (1972). Schacter initially noted that eating in the obese tended to be regulated by salient external cues such as food cues or diurnal patterns rather than physiological hunger and satiety signals. Such a reliance on external regulation of food intake was said to leave individuals vulnerable to overeating behaviour in the repeated presence of food. Schacter and Rodin (1974) later speculated that such an 'external' style of eating may be related to a ventromedial dysfunction in the usual hypothalamic/physiological regulation of hunger signals. Nisbett, however, indicated that not all obese eaters were regulated by external cues (Nisbett, 1968). Rather than externality per se, Nisbett (1972) noted that obese behaviour closely resembles that of hungry/starving organisms (Nisbett, 1972) and retained a hypothalamic hypothesis for obesity, but based it on an approach related to normal, rather than abnormal eating regulation.

Nisbett's new approach, which was central to the initial development of the restrained eating concept, proposed that eating regulation revolves around the physiological maintenance of biological/homeostatic set points, specifically maintenance of a constant fat cell size. Nisbett proposed that obese individuals are biologically endowed with a higher quantity of fat cells relative to non-obese individuals. In Nisbett's theory, obese individuals as a result of biological inheritance have no choice but to be the size they are. However, social pressures to diet leads to a reduction in fat cell size, but not quantity, triggering hypothalamic based homeostatic mechanisms that promote eating behaviour directed towards maintaining adequate fat cell size. Dieting serves to exacerbate hunger directed towards maintaining a homeostatic set point of fat cell size. The eating patterns of obese individuals may therefore be determined by relative degree of biological deprivation below set point, and not by relative degree of overweight. External orientations to eating can be explained in terms of seeking nutritional cues that may lead to food consumption and hence re-establishment of the biological set point. An implication of Nisbett's set point theory,

capitalised on by Herman and Mack (1975) and later Herman and Polivy (1980), was that the key determinant of eating regulation was deprivation below the set point and not degree to which an individual was overweight.

Herman and Mack (1975) proposed a psychological modification of the set-point theory of eating regulation which focused on the presence of what they called 'restrained eating'. That is, the intended and actual reduction of dietary intake measured by the extent to which individuals were consciously aware of constantly monitoring their food consumption. Restrained eating was initially hypothesised as a rough psychological index of degree of deprivation below the biological set-point deprivation, but was subsequently adopted as an important predictor of eating behaviour not only in the obese, but in non-obese individuals who also restrained below their set point (Herman & Mack, 1975; Herman & Polivy, 1980; Herman & Polivy, 1984; Polivy & Herman, 1985). A key definitional aspect of restrained eating, related to set point theory, was the emphasis on deliberate cognitive *inhibition* of food intake. This was in essence a theory of the psychological regulation of eating, rather than a pre-dominantly physiological regulation approach. The inhibitory characterisation of restrained eating, in combination with a biological set point within a normal weight region allows the concept of restrained eating to be generalised to normal weight individuals.

Inconsistent findings and problems in operationalising terms such as 'externality' and 'set point' (see Ruderman, 1986, for a review) were problematic for Schacter's and Nisbett's theories, but research interest in the concept of restrained eating as an important determinant of eating behaviour continued. A major contributor to this maintained interest was the operationalisation of restrained eating based on Herman and Mack's (1975) Restraint Scale, and the later Revised Restraint Scale (RRS: Herman & Polivy, 1980). Psychometric measures have allowed exploration of a number of factors related to the forming and breaking of apparent restrained eating patterns. However, whilst the applicability of restrained eating or dietary restraint concepts to normal weight eaters has enjoyed increasing research emphasis, its application to obese individuals has been questioned (e.g. Ruderman & Wilson, 1979; Ruderman & Christensen, 1983; Ruderman, 1986) and still remains an issue of some debate (Heatherton, Herman, Polivy, King, & McGee, 1988).

It is important to clarify the use of the terms used to refer to dietary restraint as a concept, as some confusion can occur when adopting synonymous usage of the terms 'dietary restraint', 'restrained eating', and 'dieting'. Up until this point in this thesis the term 'dietary restraint' has been used to imply the restriction of food intake behaviour as generally measured through various self-report instruments. Similarly, the original term 'restrained eating' (Herman & Mack, 1975) upon which dietary restraint approaches are generally based, implied self-imposed psychological restriction of eating behaviours, rather than physiological regulation, whilst also being interpreted as directly related to level of *concern* about weight. However, the important distinction between the actual restrictive eating behaviours involved in weight loss dieting and the intention to restrain eating, i.e. the level of concerns over reduction of eating and body weight, has generally not been made clear. This terminological issue captures the crux of the dietary restraint concept. These definitional issues become especially important when dealing with research, to be reviewed later in this chapter, which suggests that questionnaire measures of restrained eating and dietary restraint are not necessarily indicative of actual weight loss behaviours (e.g. Lowe, Whitlow, & Bellowar, 1991; Lowe, 1995) involved in dieting, despite the terminological and theoretical implications.

In order to reduce confusion at this stage, but maintain some recognition of the terminology used in the experimental literature examined below, the term 'restrained eating' will more accurately refer to a self-report index of restraint concerns directed towards the restrictive control of eating. In a majority of studies the self-report measure has been the RRS. Similarly, the term 'dietary restraint' is used to cover the complex dimensions of the concept of restraint concerns and behaviours as defined by a wider range of questionnaire instruments. The extent to which a particular restraint questionnaire focuses on concerns and/or behaviours is an issue of importance and will be dealt with in depth in subsequent sections of this chapter. Terms such as 'dieting' and 'current dieting' are reserved for actual weight loss behaviours or behavioural weight loss regimes usually reported by individuals as 'currently being on a diet to lose weight'.

The term disinhibition of eating is directly related to the nature of restrained eating as an inhibitory process. However, it may be more accurate to interpret the term as meaning loss of control over eating, which in general refers to increased eating behaviour under certain experimental manipulations related to control manipulations.

Though the term ‘disinhibited eating’ may be slightly misleading in terms of the need for initial inhibition related restraint, it is maintained here in order to equate with the terminology used in the general restraint literature.

With historical and semantic issues aside, the next section explores some of the research examining the concept of restrained eating, especially its capacity to predict so-called disinhibited eating or overeating in individuals with high restraint scores versus those with low restraint scores in a variety of experimental manipulations.

2.2.3. The paradox of disinhibition: Restrained eaters’ reactions to pre-load consumption and emotional stress.

Conceptually and empirically the construct of restrained eating has been intimately bound with the disinhibition of eating, i.e. the removal of inhibitory restraint and the effect of such removal on actual eating behaviour. In terms of original set point approaches, restraint in eating is seen as an attempt to fend off hunger signals in the service of obtaining a socio-culturally acceptable body size/shape. The interplay between restrained eating and disinhibition has been a central topic in the restrained eating literature, though this relationship has become somewhat separated from the original set-point formulations, and whether it defines the overall domain of dieting behaviours has been questioned (e.g. Lowe, 1993; Booth, 1994). Nevertheless, the paradox remains that as concerns and behaviours related to reported restrained eating increase so does the disinhibition of eating. This paradox has been a focus of early and current interest in restrained eating, particularly in terms of identifying situations which elicit disinhibitory responses from restrained eaters. Initial experimental studies examined groups of restrained eaters and non-restrained eaters, based on a median split of scores on the original restraint scale (Herman & Mack, 1975) and revised versions of it (RRS: Herman & Polivy, 1980). Two principal types of disinhibitory manipulations were examined, namely consumption of high calorie pre-loads, and emotional stressors.

#### Food based manipulations.

Consumption based manipulations have typically involved an obligatory pre-loading with food followed by measuring the amount eaten in a subsequent free eating phase. Physiologically, the consumption of a pre-load should reduce subsequent



amounts eaten by facilitating satiety inducing signals. Accordingly, regulatory eating, has been defined in terms of the specific reduction in normal level of consumption after a pre-load, whilst counter-regulatory eating is characterised by an increase in eating behaviour after a pre-load. These definitions may be useful, but are principally heuristic and relative, as the process of hunger and satiety mechanisms in human eating are complex and multi-determined (e.g. Booth, 1994; Logue, 1998). Early pre-load studies found that non-restrained eaters tended to show regulatory eating, whilst restrained eaters ate more after a pre-load, and hence could be seen as counter-regulating (Herman & Mack, 1975; Spencer & Fremouw, 1979; Ruderman & Christiansen, 1983; Herman, Polivy, Lank, & Heatherton, 1987). When self-imposed restraint is intact in restrained eaters, such as in a no pre-load condition, the amount they consume in free eating situations tends to be less compared with non-restrained eaters.

Herman and Polivy (1980) suggested that violating inhibitory restrained eating behaviour, by administering an obligatory pre-load, disrupts the delicate balance of physiological and self-control pressures required for adequate restrained eating. In more mundane terms pre-load violations generate 'I've blown it' responses to dieting (Ruderman, 1986) allowing uninhibited eating to occur until restraint becomes established again. These demonstrations have involved primarily female participants though counter-regulatory eating has also been found in at least one male sample of restrained eaters (Hibschler & Herman, 1977). The general gist of these early studies was that, paradoxically, higher levels of restraint leave restrainers increasingly open to disinhibition of eating under particular circumstances, specifically obligatory food pre-loads. However, this disinhibitory perspective should be taken with caution as a study examining the self-talk of restrainers (Jansen, Merckelbach, Tuiten, and van der Hout, 1988) found no increase in disinhibitory thoughts following a pre-load, even though counter-regulatory behaviour was found.

Beliefs and expectations also appear to play an important role in mediating the effect of pre-loads on restrained eating, further separating out the cognitive and physiological aspects of this phenomenon. Early indications of the importance of anticipatory cognitions arose serendipitously from a failure to replicate the established pre-load effect (Ruderman & Wilson, 1979). Ruderman and Wilson, using a within subjects design based an initial free tasting session followed by a pre-load plus free tasting twenty four hours later, initially found no effect of a pre-load on restrained and

unrestrained eaters, with both groups eating more in the free eating trial regardless of pre-load condition. However, the within-subjects design utilised by Ruderman and Wilson, may have led to anticipation of a future overeating created by free tasting in the first sessions and expectation of an additional pre-load in the second session which led both restrainers and non-restrainers to expect eating more after a pre-load. A complex set of studies (Tomarken & Kirschenbaum, 1984; Ruderman, Belzer, & Halperin, 1985) further examined the disinhibitory effects of anticipated consumption on restrained eaters, uncovered by Ruderman and Wilson (1979). Tomarken and Kirschenbaum (study 1, 1984) found that an anticipated high calorie meal led to more eating in restrainers after a pre-load than anticipated low calorie meal or no meal control, but unexpectedly non-restrainers paralleled the restrainers consumatory patterns across all conditions. Ruderman, Belzer, Halperin, also found that the disinhibitory affect of anticipated future meals in restrained eaters was independent of anticipated physiological deprivation.

The effect of food type used in the free eating phase has also been identified as an important factor. Tomarken and Kirschenbaum (1982, study 2) found that when ice cream was used in the free eating trials unrestrained eaters, but not restrained eaters, were significantly affected by anticipated eating manipulations. It appeared that consuming appetizing sugary foods, such as ice cream, overshadowed the impact of less salient manipulations in restrained eaters. Tomarken and Kirschenbaums' second study suggests the existence of a potential hierarchy of disinhibitors based on the salience of potential disinhibiting manipulations, with type of food being an important factor.

A number of studies have also explored the effect of false information in relation to the caloric content of foodstuffs used in free eating. Describing a low calorie pre-load as high in calories is equivalent, in counter-regulation terms, as an actual high calorie pre-load for restrained eaters (e.g. Polivy, 1976; Spencer & Fremow, 1979; Kirschenbaum & Tomarken, 1982). A later study by Knight and Boland (1989) suggested that it was the perception of foods types as 'forbidden' in relation to dieting practice, rather than their reported calorie content, that was responsible for disinhibition in restrainers. The importance of belief has also been demonstrated in studies where a placebo based suggestion was sufficient to induce hunger and satiety eating in restrained eaters (Heatherton, Polivy, & Herman, 1989). Alcohol has also been found to induce disinhibited eating, but only under certain complex conditions, primarily when

participants knew they were drinking actual alcohol, rather than a placebo labelled as alcohol or alcohol mislabelled as vitamin C (Herman & Polivy, 1976a).

Certain types of conditions have also been shown to re-establish restrained eating after a usually disinhibitory stimulus. Regulatory eating has been re-established using cues enabling self monitoring (Kirschenbaum & Tomarken, 1982); contexts emphasising self-regulation and possible public attention (Polivy, Herman, Hackett, & Kuleshneyk, 1986; Stephens, Prentice-Dunn, & Spruill, 1994); and the presence of an experimenter-observer (Herman, Polivy, & Silver, 1979) or diet maintaining confederate (Polivy, Herman, Younger, & Erskine, 1986). However, the presence of a diet *breaking* confederate can act as a disinhibitory trigger in normally restrained individuals (Polivy et al, 1986). The latter studies distinctly reflect the effect of context and social exposure on restrained eaters, and their receptivity to social information about self-control and modelling/imitation effects. The fact that information processing about food and the context of consumption can regulate restraint or disinhibitory behaviours in restrained eaters indicates the importance of cognitive and contextual factors in the study of restrained eating.

### Emotional manipulations.

A second type of disinhibitor commonly used in dietary restraint research has been negative emotional stimulation, typically adopted in experiments using a free eating phase following the emotion manipulation. In a seminal study, Herman and Polivy (1975) found that when expecting an anxiety inducing 'fairly painful electric shock' unrestrained eaters ate significantly less than restrained eaters in the same conditions. However, despite higher general levels of anxiety, restrained eaters who were anticipating shock did not disinhibit in relation to control restrainers who were not anticipating shock. Restrainers seemed to be less effected by the anxiety inducing effects of anticipated shock, i.e. the reduced appetite experienced by non-restrained eaters, but restrainers did not exhibit the expected disinhibition effect found in a majority of pre-load studies.

On the other hand, some studies provide evidence for a general disinhibiting influence of negative emotionality, rather than anxiety *per se* in restrained eaters. Clinically depressed restrainers tend to gain more weight, which raises the possibility

that they have more disinhibited eating episodes than their non-restrained depressed counterparts for whom significant weight loss is more prevalent (Polivy & Herman, 1976b). There is some support for this interpretation in an experimental context, where Baucom and Aiken (1981) found that experimentally induced depressive mood increased eating behaviour in dieters, categorised using a simple dietary status question, whilst the reverse was found in non-dieters. Eliciting disinhibitory reactions to emotional stressors in restrainers appears to be a complex process, and seems to depend on the nature of the affective reaction generated.

The disinhibitory effect of negative mood has also been found in a number of other studies, though disagreement exists on whether weight fluctuation (Frost, Goolkasian, Ely, & Blanchard, 1982); concern for dieting (Ruderman, 1985), or susceptibility to hunger (Lowe and Maycock, 1992) are responsible for the effect. There also appears to be a complex interaction between the combined effects of pre-loads and anxiety manipulations, with obligatory pre-loads reducing the normally disinhibited eating of restrained eaters in high anxiety situations (Herman, et al. 1987).

In order to explain the differences between the original Herman and Polivy (1975) and subsequent emotional disinhibiting studies, Heatherton, Herman, and Polivy (1991) proposed that ego involvement in threat, rather than physical threat per se was responsible for disinhibiting restrained eaters during mood induction experiments. Empirical exploration supported the finding that ego threat, e.g. failure feedback, is a more effective disinhibitor of eating in restrainers than anticipated electric shock (Heatherton, et al, 1991). However, Schotte (1992) and Cools, Schotte and McNally, (1992) argue that actual ego threat is not a strict pre-condition for stress related overeating, pointing out that effective disinhibitory manipulations such as exposure to a horror film do not involve ego-involvement. Heatherton, Herman, and Polivy (1992) replied that horror films and films in general are a means of escape from negative ego-involvement and aversive self-awareness, which has been associated with disinhibition of eating and binge behaviour (Heatherton & Baumeister, 1991), as briefly examined in chapter one.

The effect of negative mood or anxiety seems to be to disrupt the balance between self-imposed restraint and physiological aspects of eating, proposed as an explanation of pre-load manipulations by Herman and Polivy (1980). Herman and

Polivy (1975) suggested that anxiety acts to remove self-control allowing the disinhibition of deprivation-motivated eating initially suppressed by restraint. Findings that restrained eaters have demonstrated higher emotional reactivity when rating emotional stimuli than non-restrainers (Polivy, Herman, Warsh, 1978), supports the view that they have a heightened reaction to potentially distressful stimuli. Baucom and Aiken (1981) adopt a similar interpretation of the disruptive effect of negative mood on restraint, but suggest an alternative explanation specific to depression where normal motivators, including dieting based motivators, tend to lose salience (Costello, 1972) as a result of underlying depressive processes.

The loss of expected control generated by learned helplessness experiences related to types of depression (e.g. Seligman, 1975) may also reduce restraint related behaviour, leading to increased disinhibitory reactions. The removal of restraint may also subsequently act as an ego threat in itself, engendering a negative view of the individuals capacity for self-control. Lack of control over food consumption, such as in obligatory pre-load paradigms may also act as an emotional stressor. Kirschenbaum and Dykman (1991) found that high self-control restrainers, individuals who tend to have strict commitment to dieting, given a diet breaking pre-load, disinhibited significantly more than low self-control restrainers after pre-load. The provision of an obligatory pre-load clashes with the strict maintenance of a dieting regime, leading to potential loss of control.

Later theories of affect-based disinhibition have focused on what have been characterised as purposive or non-purposive explanations (for a review see Greeno & Wing, 1992; Polivy, Herman, & McFarlane, 1994). Purposive explanations focus on eating being functional as a means of deflecting or overshadowing negative affect. This type of eating is in contrast to more general reactions to stress, which tend to reduce eating behaviour. An example of the purposive view is a proposed masking effect of excessive eating which allows an individual to focus on immediate distress related to overeating rather than on long-term implications of current failure and ego threat (Herman & Polivy, 1988).

Non-functional approaches to stress-related eating characterise disinhibited eating reactions as side-effects of some other mechanism that promotes the consumption of food, but the consumption in itself does not serve a specific purpose. Such

mechanisms may be a result of a general tendency towards externally driven behaviour or as a result of some coping strategy the individual employs to deal with stress. As mentioned in chapter one, a key theory of interest to this thesis and an example of non-purposive approaches are Heatherton and Baumeister's (1991) Escape Hypothesis in which a shift in self-attention away from aversive self-realizations or ego threat allows the disinhibition of previously inhibitory restraint. The attentional shift is a coping reaction which also reduces higher level control of behaviour and cognition, leaving the person open to non-restrained, i.e. disinhibited eating in the presence of food cues. The extent to which overeating in restrainers is functional, as in the masking theory, or a consequence of other processes, such as depression related loss of control or affect driven escape, remains an issue of debate (e.g. Polivy, et al. 1994).

#### Attractiveness and media based disinhibitory manipulations.

Before moving onto the next section, which describes a general model of restraint, two types of disinhibitors based on potential body image comparisons and dissatisfaction should be mentioned here as they reflect some of the major issues in this thesis. Green and Saenz (1995) demonstrated that social comparisons might serve as a means of disinhibiting restrained eaters. Using the RRS as a measure of restraint, participants were either exposed to a physically attractive or physically unattractive confederate in a relatively competitive situation, in which the confederate and the participant had the task of assessing various products with the possibility of one individual going on to paid participation in a national market research survey. Attractive confederates were 'well-dressed in form fitting clothes, with a fashionable hairdo and make-up', whilst unattractive confederates were 'dressed in shabby, baggy clothes, made to look overweight, not wearing make-up, with her hair sloppily done' (Green & Saenz, 1995, p8). In a subsequent free eating 'taste-test' restrainers and non-restrainers exposed to an attractive confederate did not significantly differ in consumption, however, in the unattractive condition restrainers ate significantly more than non-restrainers. It appeared that exposure to unattractive individuals lead to disinhibition in restrainers, but not in non-restrainers.

Taking into account negative affect and dieting self-efficacy Green and Saenz (1995) also found that appearance comparisons led to significant negative affect and reduction in dieting self-efficacy, which subsequently predicted the outcome of eating

behaviour. This model suggested that negative affect and a subsequent reduction in dieting self-efficacy mediate relationships between appearance comparisons and disinhibited eating. More importantly the mediational affects were only found for restrained eaters. There are a number of potential interpretations of this effect. The restrained eater may feel fear and repulsion at exposure to the unattractive individual, which in-itself may trigger negative affective reactions, but also such fears may trigger self-comparisons and images of what the restrainer may become. This fear of an unattractive 'possible self' fits in well with Heatherton and Baumeister's (1991) bingeing as an escape from self-awareness, with the unattractive individual reflecting the restrainers worse fears which are defended against in a way that may lead to subsequent disinhibition.

In a similar study, Seddon and Berry (1996), exposed restrainers to television advertisements containing slim attractive female stereotypes. They found that restrainers exposed to such stereotypes ate more in a subsequent taste test than non-restrainers. Restrainers and non-restrainers exposed to a neutral advertisement control condition, not containing female stereotypes but controlling for advert style, valence, duration, and content, ate similar amounts. There was a non-significant tendency for restrainers to eat more after the stereotypical advertisements than the neutral condition, with this pattern reversed for non-restrainers. Changes in state self-esteem were also examined, but no significant changes were reported for restrainers and non-restrainers after either the 'stereotype' or neutral advertisement exposure. The exposure to attractive female exemplars in the context of actual T.V. advertisements seems to mediate disinhibition in restrainers, however, this appears not to function via a self-esteem mechanism, suggesting that the slim or thin attractiveness ideal of women represented in the stereotypical advertisements may be responsible for the disinhibition effect. In contrast to Green and Saenz (1995), the disinhibiting stimuli in Seddon and Berry's study were based on attractiveness. It is possible that the comparison process initiated in Green and Saenz's study was more individually driven in terms of a possible self. The use of a media frame of reference, i.e. T.V. advertisements, may have acted as a focus for a more general social route of expressing ideals of female attractiveness, and therefore have triggered a more general socially based comparison process.

As a final point with regard to these attractiveness studies, both Green and Saenz (1995) and Seddon and Berry (1996) used a wide age range of individuals, including

individuals in the 40-63 age range. Green and Saenz used a slightly younger sample (mean age 19.1, range 17 to 46) compared to Seddon and Berry's (1996) sample (mean age 25.6, ranging from 16 to 63). Such a wide age range may obscure potential heterogeneity in restraint considerations), including body dissatisfaction which may play a major role in attractiveness comparison processes. However, Davis, Shapiro, Elliot, & Dionne, (1993) do indicate that whilst body dissatisfaction and body focus remain predictive of restraint, emotional reactivity is less in older women compared to younger women. Nevertheless, heterogeneous relationships between restraint and disinhibition cannot be ruled out in relation to age factors.

2.2.4. The boundary model of restraint and the need to differentiate dieting from restrained eating concerns.

Herman and Polivy (1984) developed a boundary model of restrained eating, based on physiological and cognitive mechanisms of dieting behaviour, incorporating the findings from a number of disinhibition studies. In the boundary model restrained eaters were seen as imposing a cognitive boundary on the amount eaten. This boundary is located within a neutral zone of biological indifference that lies between the physiologically defined zones of hunger and satiety. Social and psychological factors are seen as particularly relevant in regulating eating within the zone of biological indifference as biological factors are no longer operating.

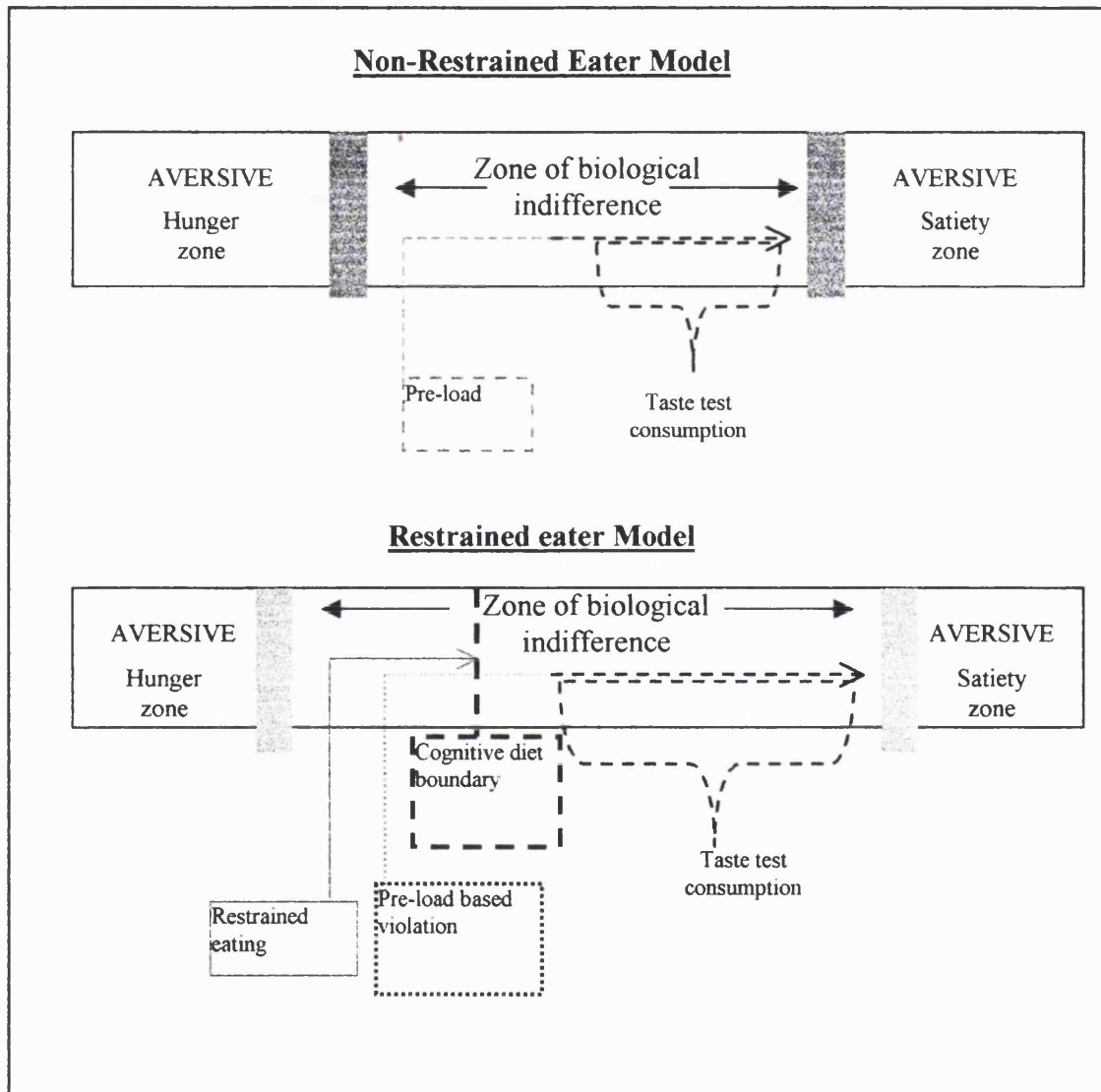
A restrained eater would normally only consume the amount of food needed to take them to their self-imposed restraint boundary, but a breaching of the restraint boundary would break their diet and lead to subsequent disinhibited eating towards satiety levels. It is within the zone of biological indifference that cognitive regulation works best. This model is illustrated in figure 2.1 in relation to pre-load manipulations, though manipulations related to other disinhibitors can be interpreted in similar fashion. The smaller hunger zone for restrainers is a hypothesised result of a resistance to hunger acquired through their prolonged limitation of food intake (Herman and Polivy, 1984). The boundary model emphasises psychologically imposed restraint, and its violation, as important cognitive determinants of eating behaviour, intimately connected with the concept of disinhibition. The concept of a restraint boundary seemingly operationalised by measures such as the RRS, has treated restrained eating as synonymous with actual dieting behaviour. As mentioned earlier experimental studies of disinhibitory and



counter-regulatory responses, including mood manipulations, have also reinforced a behavioural interpretation of RRS restraint scores.

**Figure 2.3**

**Diagram representing Herman and Polivy's (1984) boundary model of eating regulation with additions to represent affects of pre-loads.**



Note: In this model eating is regulated freely within by zones of aversive hunger and satiety in non-restrainers where restrainers impose a boundary upon eating, which when violated initiates eating to satiety. Grey dashed arrows indicate hypothetical eating in response to consumatory manipulations, dark dashed arrows indicate amount consumed in a free eating taste test. The amount of pre-load is the same for restrainers and non-restrainers.

A line of research has recently developed suggesting a confound between operationalising restraint in terms of chronic eating and weight concerns versus acute dieting behaviours. A number of studies (e.g. Lowe, Whitlow, & Bellwoar, 1991; Lowe,

1993) have indicated that restrained eaters as defined by measures such as the RRS are not all actually dieting to lose weight (e.g. Lowe et al, 1991). In addition, the disinhibitory profiles of restrained eaters who are actually dieting to lose weight significantly differ in the same experimental conditions from restrained eaters who are not on a weight loss diet. Restrained eaters, defined by high scores on the RRS, ate significantly *less* after a pre-load when they were also dieting compared to non-dieting restrained eaters in the same pre-load condition (Lowe et al, 1991). Generally, previous findings suggest that restrained eaters eat more after a pre-load, but such findings assumed restrainers to be a homogenous group and did not account for the presence of current dieting to lose weight. Restrained eaters who were also dieting ate significantly *more* without a pre-load than restrained eaters who were not dieting. The eating behaviour of restrained eaters who also diet stands in sharp contrast to previous studies, while the non-dieting restrained eaters showed the classic pattern of higher consumption after pre-load than without pre-load.

The original findings of Lowe et al. (1991) were subsequently replicated by Lowe (1995). Heatherton and Rolls (1991) also found that normal-weight dieters ate significantly less following pre-loads compared to normal weight non-dieters, bulimics, and overweight dieters. The contrasting eating patterns of current dieters and non-dieters has also been found using mood manipulations (based on Baucom & Aiken, 1981) with dysphoric dieters eating significantly less than non-dysphoric dieters (Eldredge, 1993), rather than demonstrating the usual disinhibitory eating of restrained participants in response to mood manipulations. These studies clearly indicate that restrained eating and actual dieting may lead to different types of disinhibitory profiles (Lowe, 1993) and must be conceptually separated.

Lowe (1993) suggests that Herman and Polivy's (1984) boundary model has confounded chronic and acute weight loss dieters, and that the concept of a cognitive boundary applies only to acute dieters (current dieters) rather than chronic dieters (classic restrainers). Chronic dieters are defined as classic restrainers because whilst they may not be currently dieting to lose weight, they have a long history of previous dieting attempts. Current weight loss dieters are committed to maintaining an immediate restrictive regime that becomes relevant in the face of salient threats to dietary goals, as in the case of pre-loads (Lowe 1993; 1995). This salience hypothesis explains why current dieters restrict their eating after pre-loads, but tend to eat more under conditions

where dietary violations are not so salient, such as in control conditions. In the absence of disinhibitory stimuli to focus and reinforce dieting regimes, dieters appear to increase consumption (Grilo, Shiffman, & Wing, 1989; Lowe, et al, 1991; Logue & King, 1991; Lowe, 1993; Lowe, 1995).

The effect of induced emotional states is also to reduce consumption in current dieters, perhaps because it allows self-focus to be shifted towards the negative affect, rather than towards a desire to comply with urges to eat. Dieters appear more likely to relapse into overeating in conditions of low arousal (Grilo, et al, 1989), supporting this lack of distraction hypothesis. However, this view reverses the functional aspects of emotional/stress induced eating suggested previously, which focuses on overeating as a means of masking or disguising some emotional stressor, rather than the stressor acting as a focus for food urges. Of course, the processes underlying current dieting and classical restrainers may be different, as in the case of pre-load consumption.

In order to explain the behaviour of non-dieting restrainers, Lowe (1993) suggests that such individuals have a history of chronic dieting and overeating that has left them relatively insensitive to food deprivation and to level of food intake. Hence non-dieting restrainers eat less in general control conditions, but can exhibit disinhibitory type eating once such eating is initiated. Such a relative insensitivity to food deprivation and intake leaves restrainers open to regulation of food intake by external cues, so that they follow the apparent task demands or external cues about expected eating found in experimental manipulations rather than hunger/satiety or current diet driven regulation. The use of beliefs and expectancies to indicate substantial eating, such as placebo instructions (Heatherton et al., 1989), and false information about pre-load calorie content (e.g. Polivy, 1976; Spencer & Fremow, 1979; Kirschenbaum & Tomarken, 1986) fits this approach (see Lowe, 1993 for review). The use of regulatory manipulations such as self or public monitoring or modelling also indicates an external responsiveness to environmental cues. Lowe (1993) further suggested that affect based manipulations disinhibit restrainers' eating through past association with failed restricting or overeating behaviour. The presence of negative affect triggers a conditioned type response to overeat in restrainers, which would otherwise serve as a distractor from urges to overeat in current dieters. This type of explanation is broad enough to leave open a number of other possible mechanisms for emotion-based eating.

Lowe and colleagues' re-appraisal of the restraint model rejects the notion of a cognitive boundary open to disruption in restrained eaters, preferring instead a more complex model based on past and current weight status. In restrained eaters, rather than the removal of a restraint boundary, the lack of internal based regulation of eating and their receptivity to context based expectations appears paramount. If Lowe's (1993) approach is correct, then such receptivity is generated by a relative insensitivity of internal regulation of food intake due to chronic dieting. In fact, as Lowe indicates, this view of restraint theory is consistent with initial assumptions surrounding the restraint approach, but it re-defines the nature of the boundary models to incorporate current dieting.

A crucial clarification remains in that if measures such as the RRS are not indicative of actual dieting behaviour, then we need to decide what such instruments are measuring. In Herman and Mack's (1975) original study, the concept of restrained eating was introduced as a putative indicator of the level of concern attached to weight and the practice of restraint in eating habits. Herman and Mack directly stated that higher levels of restrained eating concerns implied behavioural restraint of eating, which in turn was indicative of an individuals' status as below their nutritional set-point, and therefore indexed their vulnerability to eating more when restraint is removed and attractive food cues presented. Re-examining the item content of the RRS it is clear that a majority of items are either related to histories of weight fluctuation or histories of restraint and overeating related concerns. Only one item is related to actual behavioural restriction, but also implies disinhibition ('Do you eat sensibly in front of others and splurge alone'). There are also items relating to concern over monitoring and thinking about eating. It is clear, therefore, that the RRS is a measure of dieting *concerns*, rather than behaviours per se, and these concerns are represent a chronic history of dieting and weight related worries.

In addition to measuring chronicity of dieting and weight concerns, instruments such as the RRS may help elucidate relationships between a number of variables. Tiggemann (1998) found that level of restrained eating, measured using the RRS, influences the extent which body dissatisfaction is related to psychological well being, with high restraint indicating a higher association between poor psychological health, and weight/body dissatisfaction. When restrained eating is lower the psychological

health and dissatisfaction relationship is much smaller. Unfortunately, Tiggemann used the RRS as an indicator of actual dieting behaviour, so the issues raised above by Lowe and colleagues are relevant here. However, Tiggemann's findings make more intuitive sense when restraint is interpreted in terms of chronic dieting and weight concerns. High levels of restrained eating concerns may represent a repeated means of expressing weight dissatisfaction, while also making salient current weight dissatisfaction. Reduced psychological well being occurs when weight and body dissatisfaction, rather than being ignored, are repeatedly expressed via chronic restraint concerns, whilst even relatively high weight dissatisfaction may be generally ignored, leading to higher levels of psychological well-being.

To summarise, the traditional concept of restrained eating as involving a self-imposed cognitive boundary upon level of food intake has emphasised a behavioural interpretation, but confounds past dieting with current dieting experiences. The concept of restraint has been recently reformulated along the lines of chronic dieting which leads to relative insensitivity to internal eating regulation, leading both to lack of perception of disinhibited eating and a reduction in general eating behaviour. The redefinition of restrained eating measures as indexes of chronic dieting punctuated by overeating, but not identical with current dieting, illustrates the distinction between dieting behaviours and diet related concerns. The nature of instruments used to measure dietary restraint needs to take this into account. The next section examines related issues in measuring restraint. In particular it addresses the issue of what restraint questionnaires are really measuring.

#### 2.2.5. Advancing the restraint construct: Alternative measures of the restraint and disinhibition constructs and their psychometric properties.

The experimental disinhibitory paradigm has become a general benchmark for predictive validity of other restraint scales. However, given the distinction between restraint concerns and actual dieting behaviours this validation framework may be overlooking a number of important factors. Primarily, there appears to be a lack of exploration of other aspects of the restraint construct potentially unrelated to disinhibitory responses. Reliance on the disinhibitory paradigm perpetuates assumptions that most restrainers tend to disinhibit their eating under particular conditions. It has therefore been of increasing importance to broaden out the different dimensions of the

restraint construct, applying psychometric and multivariate evaluations to further explore other aspects of restraint.

### The Revised Restraint Scale (Herman & Polivy, 1980)

The overall RRS has been associated with a variety of laboratory-based disinhibitory behaviours. Using multivariate regression analysis Davis, et al. (1993) have also found positive relationships between the RRS, body dissatisfaction, body mass index, emotional reactivity (neuroticism), and level of physical exercise in women under 35. As noted above multivariate path analytic examination of the RRS has also supported a moderating effect of dieting concerns on the relationship between weight dissatisfaction and psychological well being, with high RRS scorers showing increased association between these two factors compared to low RRS participants (Tiggemann, 1998). However, factor analytic evaluations of Herman and Polivy's RRS using normal weight individuals have suggested that it represents at least two different factors: concern for dieting (CD), and weight fluctuation (WF) or weight history (e.g. Blanchard & Frost, 1983; Ruderman, 1983 sample 1; Polivy, Herman, & Howard, 1986; Allison, Kalinsky, & Gorman, 1992; Heatherton et al, 1988 for review). The CD and WF factors correlate (Blanchard and Frost, 1983) moderately with body image (CD from  $r = 0.17$  and  $r = 0.29$ ; WF from  $r = 0.18$  and  $r = 0.23$ ), whilst only CD significantly correlated with public self consciousness ( $r = 0.30$ ) and social anxiety ( $r = 0.12$ ). Ruderman (1985) also found that CD correlated with rigid absolute beliefs, suggesting that the CD may be a more appropriate characterisation of restrained eaters than WF. Use of the overall RRS ignores the potential differential impact and relationships CD and WF may have on factors of interest, obscuring interpretative information.

In reply to appeals for subdividing the RRS Heatherton et al. (1988) suggest that while WF and CD represent different aspects of restrained eating, the concept of restrained eating requires recognition of both dietary concerns (CD) and an index of unsuccessful dieting measured by WF. Central to this position is the operationalising of general restrained eating as a usually unsuccessful behaviour, representing chronic attempts to restrain motivated by dietary concern punctuated by periodic disinhibition suggested by high levels of WF. The moderate to high correlations between the two RRS sub-scales supports their potential relatedness (e.g.  $r$ s ranging from 0.28 to 0.66: Heatherton et al, 1988). The one or two factor debate hinges on differences in preferred

theoretical definition of the restraint construct. However, the relative importance of these two factors in relation to disinhibition has already produced at least two contradictory results in relation to emotional disinhibitors, emphasising either CD (Ruderman, 1985) or WF (Frost et al, 1982) as the factor relevant to disinhibited eating. It seems plausible, therefore, that use of the RRS should at least examine sub-scale scores, if only to explore the possible differential relationships between CD and WF and other factors of interest.

### The Three Factor Eating Questionnaire (Stunkard & Messick, 1985)

A number of researchers have attempted to improve on the RRS by constructing measures that are unitary and free of disinhibitory assumptions. Stunkard and Messick (1985) developed an instrument intended to measure a range of factors related to dieting behaviours based on items from the RRS and Pudel's Latent Obesity Questionnaire (1975; Stunkard & Messick, 1985). The emerging Three Factor Eating Questionnaire (TFEQ), also known simply as the eating questionnaire (EQ), defined factors for cognitive control of eating (restraint), disinhibition of eating, and susceptibility to hunger. The cognitive restraint and susceptibility to hunger factors remained robust during original scale construction and factor exploration, however, the disinhibition factor generalised after scale refinement from an initial behavioural and weight liability factor. Subsequent explorative factor analyses (e.g. Ganley, 1988) and confirmatory factor analysis (Hyland, Irvine, Thaker, Dann, & Dennis, 1989) have found robust replication of the original cognitive restraint factor structure. This cognitive restraint factor may be related to successful restraint based on conscious efforts to control and restrain eating. Also, cognitive restraint does not elicit disinhibitory responses when used to categorise restrainers in a disinhibitory paradigm (e.g. Lowe & Maycock, 1988; Heatherton et al, 1988; Lowe, 1993). The TFEQ cognitive restraint factor has also shown highly negative correlations with the disinhibition factor of the TFEQ (Westenhoffer, 1991), and is associated with less caloric intake (Laessle, Tuschl, Kotthaus, & Pirke, 1989), though it was associated with hunger susceptibility (Westenhoffer, 1991).

A complex psychometric evaluation of the overall TFEQ (Williams, Conento, Michela, Gladis, & Pierce, 1996), examining especially the link between restraint and disinhibition, revealed that current body weight moderated the restraint-disinhibition

relationship, with high-weight restrainers having less associated disinhibition than their thinner counterparts. Overall, a cluster analysis revealed five groups profiles based on the on the TFEQ scales. Williams et al. use the term dieters to refer to restrainers, but in keeping with the convention used in this thesis they will be referred to as restrainers, as their overall classification is based on self-report quantification. Restrainers could be subtyped as either maintainers of restraint (stringent restrainers) with high restraint and low disinhibition or hunger, or disinhibitors (disinhibited restrainers) with high restraint, disinhibition, and moderate hunger. Bingers consisted of high disinhibition and susceptibility to hunger, with low restraint. Occasional restrainers had moderate levels of susceptibility to hunger, and lower, yet similar levels of restraint and disinhibition. Non-restrainers had low levels of restraint, disinhibition, and susceptibility to hunger. It should be noted that Williams et al. used a mixed sample of males and females to define to above clusters, so it is unclear if different results would have emerged if gender differences are taken had been taking into account.

It is worth mentioning here the two other scales of the Three factor eating questionnaire; the disinhibition of eating scale and the susceptibility to hunger scale. These two scales seemed to co-vary relatively independently of the cognitive restraint factor. The disinhibition of eating scale is a measure indicative of a wide range of situations where individuals lose control over eating. Such disinhibitory situations include eating due to loneliness, emotional stress, overeating in social contexts, and weight fluctuation. Susceptibility to hunger formed the third factor and appears to relate to eating driven by hunger, rather than other forms of motivations.

A number of studies have evaluated the cognitive restraint factor of the TFEQ in isolation. In a recent analysis of the cognitive restraint sub-scale of the TFEQ, using principal components analysis, principal factor analysis, and confirmatory factor analysis, Allison et al. (1992) revealed a small second factor related to behavioural restraint. However, various LISREL (Jöreskog & Sörbom, 1986) goodness-of-fit indexes suggested two factors nested within a superordinate factor, indicating a possible unitary factor solution as appropriate. A subsequent re-analysis of Allison et al.'s data (Gorman, Allison, & Primavera, 1993), found that whilst a unitary factor solution was plausible for cognitive restraint, it none-the-less represented a continuum between cognitive restraint and behavioural items.



## The Dutch Eating Behaviour Questionnaire.

The Dutch Eating Behaviour Questionnaire (DEBQ: Van Strien, Bergers, & Defares, 1986) incorporates another operationalisation of restraint in addition to measuring emotional and externally controlled eating. Again, Van Strien et al's principal aim was to construct a restraint scale that was uni-factorial and unrelated to disinhibition. Though relatively few factor analyses have been performed on the DEBQ, the overall structure of the scale appears stable, with the restraint factor standing separate from emotional and external eating factors (e.g. Van Strien et al, 1986; Wardle, 1987; Allison et al, 1992), with restraint remaining stable across gender (Van Strein et al, 1986; Allison, et al, 1992) and relative weight differences (Van Strien et al, 1986).

The DEBQ restraint factor presents a stable uni-dimensional structure using exploratory and confirmatory factor analysis, with LISREL goodness of fit supporting these interpretations (Allison, et al. 1992). However, Ogden's (1993) examination of the wording in the DEBQ, and the RRS, also suggests a confound between items implying successful and unsuccessful restraint. Individuals tended not to discriminate between such items during responding, but a group based re-analysis suggested that both scales do discriminate between successful and unsuccessful restrainers. Like the TFEQ cognitive restraint scale, moderate levels of caloric restriction has been related to high scoring on the DEBQ restraint scale, though laboratory disinhibition studies have been unable to elicit specific disinhibitory behaviours in response to pre-load manipulations (Wardle and Beales, 1986).

Current dieting status, i.e. whether an individual is on a weight loss diet or not, may also moderate relationships between the DEBQ restraint sub-scale and other factors of interest. Rogers and Green (1993) found that current dieters were more concerned over weight, eating behaviour, and body image than non-dieting individuals of similar restraint level. The apparent amplification or moderating effect of current dieting on the restrainers supports the importance of accounting for current dieting suggested by Lowe et al. (e.g. Lowe, et al. 1991, Lowe, 1995).

### Scale comparisons and inter-relationships.

Overall, the construction of multiple measures of restraint has been a fruitful enterprise, enabling different dimensions of the dietary restraint construct to be illustrated and operationalised. Studies of inter-scale comparisons have elucidated the connection between these different restraint scales. Wardle and Beales (1987) using the DEBQ as a base measure found high correlations in females between this restraint scale and the overall RRS ( $r = 0.72$ ) and the CD sub-factor ( $r = 0.75$ ) with weak correlations with the WF scale ( $r = 0.24$ ). Laessle, et al. (1989) found significant inter-correlations between all three restraint scales listed above (RRS-TFEQ restraint,  $r = 0.35$ ; RRS-DEBQ,  $r = 0.59$ ; TFEQ-DEBQ  $r = 0.66$ ), suggesting relative degrees of overlap between scale content, though this should be in part predicted by shared item content. Allison, et al. (1992) also found weak to strong correlations between the restraint scales and several of their component factors, as displayed below in table 2.1.

The high to moderate correlations in Allison et al.'s (1992) study between the DEBQ and the other restraint measures makes intuitive sense as it is purported to measure global aspects of restraint, particularly related it seems to dieting concerns, though not as strongly related to behavioural or weight histories. The strong negative correlation between the TFEQ cognitive restraint and behavioural restraint factors, generated by a non-orthogonal factor rotation (Oblimin), indicates the emergence of the polar continuum detailed by Gorman, et al, (1993). The WF factor is uncorrelated with any of the other factors, suggesting it does not play a central role in the construct of restraint *per se*.

**Table 2.1.**  
**Correlation matrix for three measures of restraint.**

<i>r</i>	RRS concern for dieting	RRS weight fluctuation	TFEQ cognitive restraint	TFEQ behavioural restraint
RRS weight fluctuation	.00	-		
TFEQ cognitive restraint	.52	.15	-	
TFEQ behavioural restraint	.12	.01	-.56	-
DEBQ global restraint	.74	.23	.51	.29

(RRS: Revised restraint scale, Herman & Polivy, 1980; TFEQ: Three factor eating questionnaire, Stunkard & Messick, 1985; Dutch eating behaviour questionnaire: DEBQ, Van Striens et al., 1986) and their component extracted via factor analytic techniques, based on Allison et al, 1992 using a mixed gender sample.

Overall, factor analytic techniques incorporating all three scales have further elucidated the potential network of relationships. Allison et al, (1992) found 3 second order factors based on the correlation matrix tabled above, with concern for dieting and the DEBQ restraint scales loading high on the first factor, cognitive restraint and TFEQ behavioural restraint loading on the second factor, and weight fluctuation loading highly on the third factor. This three factor solution indicates the presence at least two core components related to the restrained eating construct: a concern for dieting factor and a possible successful restraint factor. The third factor indicates a separate issue of weight history or weight fluctuation that forms a feature of the construct of restraint, more related to disinhibition, but is not related to the other principle factors.

Laessle, et al. (1989) also found a three-factor solution using the RRS, TFEQ scales, and the DEBQ restraint factor in relation to a number of other measures. Unfortunately, the RRS was not partitioned in terms of CD and WF in the initial factor solution, but the emerging factors are indicative of a stable network of relationships. The largest factor represented positive loadings from the RRS and the TFEQ disinhibition sub-scale, in addition to positive loadings by caloric intake, body dissatisfaction, and drive for thinness. This first factor supports the RRS's relationship with body image concerns (Blanchard & Frost, 1983) and an association with disinhibition well documented in experimental studies. The RRS also loaded positively on a second factor that included high positive loadings from body mass index (BMI), BMI range, and maximum BMI. This second factor suggests more of a body weight dimension, possibly related to the WF sub-factor of the RRS, but lack of sub-scale information obscures this interpretation. Laessel et al. did re-analyses of their factor structures using RRS CD/WF sub-scales indicating that CD loaded on the first factor (restraint-disinhibition, body image concerns) and WF on the second factor (body weight factor) discriminating BMI based WF fluctuations and CD related relationships between body image, dietary based concerns, and disinhibition. The DEBQ and TFEQ restraint scales loaded together on a third factor along with a high negative loading from caloric intake and moderate positive loadings from body image concerns and drive for thinness, suggesting a successful restraint factor moderately related to body and slimness concerns. It should be noted that these factors represent good interpretability in relation to current theory, despite the small sample size of 60 women.

2.2.6. Summary of the restrained eating construct: The importance of multivariate exploration of restraint and the hypothetical relationships with hypnotizability and dissociation.

Multivariate examination of the three restraint scales has proven an excellent means of distinguishing aspects of the restraint concept and relationships with other factors. Laboratory studies have tended to focus on a small number of variables and generally on a single scale of restraint, allowing only narrow examination of the effects of independent variables on the dependent variable. Such laboratory studies have firmly established a relationship between aspects of restrained eating and disinhibited eating, though the need to provide an explanation of such relationships is still driving research.

The reliance on a single operationalisation of restraint can obscure the diversity of factors underlying the construct of restrained eating. Such problems have been exacerbated by the synonymous use of terms such as restrained eating and dieting, which in fact may be different features of an overall construct. The approach taken in this thesis is to acknowledge the self-report nature of scales assessing restrained eating, but also acknowledge that some of these scales, or at least sub-factors in some scales, may also be indicative of dieting in a behavioural sense in addition to the intentions and concerns related to restricting food intake.

Construction of multiple scales has allowed definition of factors related to successful restraint that suggests actual dieting behaviours, possible weight fluctuation, and disinhibition. The first two factors appear related to weight and body image concerns, whilst weight fluctuation appears, unsurprisingly, linked to body mass related measures. The RRS appears to be a measure related more to chronic dieting concerns, but does not imply the presence of current dieting to lose weight. The TFEQ cognitive restraint factor appears to contain both concern and behavioural items, mostly directed at successful conscious efforts to restrict eating. The DEBQ restraint scale appears to measure a global factor, relating to successful and unsuccessful intentions to restrict dieting, with successful intentions implying actual weight loss directed behaviours.

## Hypnotizability and dissociation as factors in dietary restraint and disinhibition.

As outlined and illustrated in chapter 1 and in the previous section on the Socio-Hypnotic approach, the concepts of hypnotizability and dieting concerns are potentially related and underpinned by a common framework of social forces operating upon the restrained eating individuals. Dissociation has also been related to suggestibility and has possible influences upon the nature of disinhibited reactions in restrained eaters. These two factors may act as both mediators, i.e. elements of a chain of reactions, or moderators, factors influencing the magnitude or presence of a relationship. Clearly, if hypothetical relationships exist then being able to identify which restraint and disinhibition measures correlate with measures of hypnotizability and dissociation would clarify the nature of the possible relationships between the constructs underlying the measures used. Multivariate paradigms based on regression and factor analysis techniques can help elucidate what aspects of restraint are related, or are not related, to hypnotizability and dissociation factors.

As a parting word for this section, the issues of participant demographics are theoretically and empirically important aspects of heterogeneity in terms of restraint, i.e. they may moderate the expression of restraint levels. Multivariate investigation based on multiple regression techniques has found that neuroticism (emotional liability) is associated with restraint in young and older women, but is only related in older men, whilst body dissatisfaction applies over all genders and age group, except for older men (Davis, et al. 1993).

### **2.3. Dieting concerns and behaviours in the general population: Socio-cultural, evolutionary, and developmental factors.**

In this section, the importance of dieting and restrained eating are examined in relation to evolutionary, developmental, and socio-cultural models of eating concern. This aims to provide a framework in which to place the issues discussed in previous sections and will continue to be of concern throughout the thesis. A majority of this section deals with questions related to dieting behaviours, rather than issues such as restrained eating per se. However, studies have used different questions in assessing whether a person is dieting or not, and it is often unclear how dieting is defined, whether it implies weight loss dieting or a general food regulation regime.

Dieting and body weight concerns appear to have attained a widespread prevalence in western culture. According to a recent review of the burgeoning dieting literature (French & Jeffery, 1994) when studies are considered in conjunction, about 61% of adults have undertaken a diet at some time in their lives, approximately 32% of adults were currently attempting to lose weight, and around 20% are actually on a diet at any one time. These statistics refer to survey questions given out across a wide range of different studies, and do not represent the findings of one study in particular. Such estimates may be problematic given the different populations sampled and the different wording used to survey dieting related behaviours.

Further examination of French and Jeffery's (1994) review identifies, in terms of adults, 50% women (based on 8 studies) and 30.75% men (based on 6 studies) answering affirmatively to the questions 'have you recently/ever dieted', with 40.7% adults overall having ever/recently dieted (based on 6 studies using males and females). These figures are, however, based on a range of studies from the mid-eighties to early nineties, with one study from 1967. Current studies reviewed by French and Jeffery from the early nineties place the total adult percentage of "ever dieted" at 34.6%, with 26.3% adult men, and 42.3% adult women. It is uncertain where French and Jeffery obtained their original percentage of 61% for adults who had ever dieted, as they are not explicit to the source of this figure in their paper, none-the-less it is clear that a large percentage of adults have dieted, with more women doing so than men. A number of researchers have stated that dieting concerns and behaviours have reached an almost 'normative' level in western society (e.g. Striegel-Moore, Silberstein, & Rodin, 1986; Polivy & Herman, 1987). French and Jeffery also suggest that the prevalence of dieting has been on the increase in recent years.

The apparent increase in dieting behaviours and concerns over the past few decades potentially reflects an increase in emphasis on dieting and slimness in society (e.g. Schwartz, Thompson, & Johnson, 1986). The level of concern about being overweight also suggests a high normative discontent. A survey of 900 American schoolgirls over a 4 year period (Huenemann, Shapiro, Hampton, and Mitchell, 1966) found that 50% of participants expressed feelings of being fat, whilst a fairly consistent level of 25% were actually classified as overweight. Feelings of being fat tended to increase with age, whilst actual level of weight remained fairly consistent. A similar

study conducted by Nylander (1971) in Sweden corroborated Huenemann et al.'s (1966) findings, with 28% of 14 year olds feeling overweight, increasing to 50% at 18 year olds. Dieting behaviours also increased with age from 10% at 14 years, to 40% at 18 years. Huenemann et al.'s' and Nylander's studies clearly indicate increasing levels of body and dieting concerns increasing with age. The disproportionate level of body weight concerns compared to actual level of being over weight, found by Huenemann et al. suggest that other factors apart from actual biology may be responsible for body concerns and potentially related dieting concerns. However, changes in biology around puberty relating to female fat distribution may be in part to blame for increased weight and dieting concerns.

If the actual levels of individuals being overweight cannot fully account for increasing dieting and body shape concerns, other factors need to be examined. A recent trend in the literature has been to examine socio-cultural factors that intuitively have a bearing on the development of dieting and body image concerns, particularly in the development of a so called 'dieting culture'. Pre-eminent amongst these factors has been the apparent trend towards endorsement of a 'thin body ideal' as a feature of female attractiveness and self-identity (Stice, 1994). The 'thin ideal' has repeatedly been proposed as one factor underlying the development of dietary disorders (Garner, Garfinkel, Olmsted, 1983; Schwartz, et al. 1986; Striegel-Moore, McAvay, & Rodin, 1986; Stice, 1994) either directly or as a motivating precursor of dieting pathology (Hsu, 1990). The changing categorisation of eating disorders has also been partially related to an intimate link with changing societal demands and stereotypes (Crowther, Wolf, Sherwood, 1992) related to women, indicating the psychoplasticity of such disorders (Russell, 1994) and partially its emergence as a socially bound construct. The apparent fact that eating disorders appear to be culturally bound to societies that endorse a so called 'thin ideal' of female attractiveness also supports the influence of thin ideals as social forces in motivating dieting concerns and eating disorders.

In western culture the ideal of female attractiveness appears to have been shrinking across the decades, apparently conforming to media generated exemplars. Evidence for this trend towards thinness has generally been anecdotal. For example, the Madame Tausauds Waxworks (London) visitor based vote for the most beautiful woman went to Twiggy in 1976, generally accepted as an extremely thin individual, after a steady rise up the ranks from 1974 to eventually replace Elizabeth Taylor at

number one. An often-mentioned study by Garner, Garfinkel, Schwartz and Thompson (1980) examined Playboy centre folds and Miss America pageant winners from 1959 to 1978 found a significant decrease in mean weight-to-height ratios, and a weight specific decrease with age and height controlled, for these potential exemplars of female beauty. The weight decreases in Garner et al.'s study were contrary to actuarial population indexes for females, which actually indicated an overall increase across the analysis period. Miss America winners also weighed significantly less than the other contestants from 1970 onwards. A follow up study of Garner et al.'s (1983) findings supported the continuing decrease in weight for Miss America winners, compared to height and age based controls, from 1979 to 1988, though centrefold statistics did not change (Wiserman, Gray, Mosimann, & Ahrens, 1992).

A study by Mazur (1986) also found decreases in weight for Miss America contestants in 1986, in addition to decreases in waist, hip and bust measurements. Unfortunately, Mazur did not subject these findings to statistical analysis, so a significant trend cannot be inferred from the data. A similar study (Silverstein, Perdue, Peterson, & Kelly, 1986) based on bust-to-waist ratio in actresses in the period 1950-1981 and models from the 1960s-1970s versus the 1940s-1950s found reductions in such ratios over time, but again lack of inferential statistics makes interpretation of these results difficult. In contrast with previous studies, Morris, Cooper, and Cooper (1989) found an increase in models height and waist measures, but no corresponding increase in hip measurements for the interval of 1967-1987. Despite some idiosyncrasies and slight inconsistencies the study of body statistics of female exemplars suggests that these exemplars have been declining in actual weight and related body measurements.

Another source of evidence for shifting patterns in attitudes towards body weight are studies examining the increase of media articles referring to dieting advice and practices. A number of studies have charted significant increases in dieting advice articles in various media materials (e.g. Garner & Garfinkel, 1980; Snow & Harris, 1986; Wiserman, et al. 1992). The increasing quantity of products and techniques for achieving a thin body ideal also reflects an economic trend to profit from the socio-cultural endorsement of achieving female aesthetic targets (Brownell, 1991). Clearly, it is the domain of sociological research that needs to assert the effect of these apparent emphasises on dieting practices, but from a heuristic viewpoint the increasing focus on



slimmer body ideals and products for achieving them has a hypothetical impact of female identity and accepted body size.

### 2.3.2. Interactions between evolutionary, developmental, and social factors in relation to female body aesthetics.

The increasing emphasis on achieving a female aesthetic ideal based on a thin/slim body image appears to be in competition with the apparent increase of body weight for both females, and males in recent times (Hsu, 1990). Average weight statistics for women, taken from the Society of Actuaries (1979), indicate that in a twenty year period, beginning in 1959, women under the age of thirty have tended to weigh increasingly more. Hsu (1990), in reviewing the evidence for increasing population body weight, suggests that such increases may be related to a food surplus and better medical treatment for infectious diseases. The biological trend to increase body weight in a food surplus ecology underlines the conflict that may exist between current social mores and the phylogenetic history of the human species (Fichter, 1990).

The human evolutionary tendency is for increased body weight to serve as a survival indicator due to the normative lack of food prevalent during the majority of human evolutionary history. Obesity in more primitive societies tends to be rare due to lack of food surplus, but when it does occur it may act as an indicator of higher survival potential and societal position in that high social class corresponds to increased access to food supplies. In modern day western societies, however, where food is more abundant for all, there is a negative correlation between body weight and social class, with lower body weight being associated with membership of higher social class. Obesity in contemporary societies is also regarded as less adaptive due to associated health risks. In addition, the effect of social class in western societies on average female weight is moderated by age (Stunkard, 1986). Pre-pubertal women in upper classes are better nourished than their lower class counterparts, but adult women in lower classes tend to be more overweight and generally weigh more than upper class adult females.

In addition to humans being poorly adapted to handle a surplus of food, the social pressures to obtain and maintain a thin body exacerbate the conflict between biological predisposition and culture. The relatively recent tendency for a thin cosmetic

body ideal in women thus represents a locus of tension between changing social values and evolutionary history.

Ironically, given the predisposition to increased average body weight due to evolutionary pressures, restricting one's energy intake appears as an apparent health benefit. What is problematic is in determining the lengths to which restraint or dieting should be taken, the nature of that dieting, and its purpose. Caloric reduction in its own right may not be a healthy option, whereas selection of appropriate foods may be. The general approach to dieting based on food restriction may be one means of establishing an unhealthy dieting regime, and as the restraint/dieting literature suggests, restrained attitudes, and actual dieting behaviours, can establish cycles of restraint and disinhibition that may eventually spiral into pathology (Heatherton & Polivy, 1994).

The desire to diet in order to fit societal ideals potentially begins at an early age, and becomes particularly emphasised during early adolescent development. Promotion of a thin body aesthetic or cosmetic ideal is especially intense for women. A number of researchers have identified developmental processes responsible for the impact of socio-cultural factors that specifically target women, and create a tension between physiology and female self-identity (e.g. Hsu, 1990; Striegel-Moore, 1993; Stice, 1994). The principle factors involve the central roles of female self-identity stereotypes in relation to body shape and attractiveness, and how these interact with a number of developmental factors such as adolescent turmoil, self-esteem, and self-identity formation.

Puberty is often accompanied by a level of emotional disturbance which can be accentuated in women and is often related to feelings of misery and confusion (e.g. Hsu, 1990). Adolescent women are generally more insecure, anxious, and self-conscious than adolescent males (e.g. O'Mally & Bachman, 1979; Savin-Williams, 1979; Tobin-Richards, Boxer, & Peterson, 1983), with such factors especially accentuated in white adolescent females (Simmons & Rosenberg, 1975). Many of these psychological factors may be related to coping with a sudden change in appearance due to pubertal development, which deviates from the ideal cultural body image which holds substantial similarities with a pre-pubescent or early pubescent body morphology. Obtaining, or attempting to obtain a return to a pre-pubertal attractiveness ideal may often be interpreted as a means of coping with, or fending off, emotional turmoil, which

ironically originates in part from natural biological changes away from such body ideals (e.g. Crisp, 1985). Female self-esteem is therefore closely linked to physical appearance during adolescence and arguably throughout a majority of adulthood. The relationship between appearance and self-esteem is also more strongly associated in women than men (e.g. Lerner & Karabenick, 1974; Tobin-Richards et al., 1983; Stice, 1994).

The sudden biological and social maturation of adolescent females also brings concerns over sexual development, the implications of potential sexual activity, and the fulfilling of conflicting stereotypical sex and gender roles which can reverberate within individual and family situations to produce a variety of stressors (Striegel-Moore, 1993). Western societies often express contrasting expectations of females sex roles that are difficult to reconcile, leading to increased confusion and emotional unrest. Women are generally stereotyped as more caring than men, more socially orientated, and more geared to relationship formation, the so-called 'relational self' (Striegel-Moore, 1993). Contrasting with this relational self there is a need for adolescents to form a representation of themselves as unique individuals. Women are therefore in a societal double bind between establishing themselves as successful and free individuals, whilst attempting to fit the relational and biological roles that are culturally expected of them, at least in western society. Again, physical attractiveness is important as a principle method of establishing relationships which the adult female role calls for, with males tending to place greater emphasis on physical appearance for partner choice (e.g. Davis, 1990).

Physical appearance in women is intimately linked with the establishment of femininity stereotypes (Stice, 1994), and to developmental issues in female adolescents (Striegel-Moore, 1993). Attractive women tend to be defined as more feminine or possess more traits associated with femininity (e.g. Heilman & Saruwatari, 1979; Gillen, 1981). Social success is also related to appearance with a number of studies showing that an attractive appearance, as related to stereotypes of attractiveness, is linked to a cluster of positive social and individual traits such as sociability, dominance, mental health, and intelligence (e.g. Feingold, 1992), and similar traits such as social competency, adjustment, integrity, and intellectual competency (Eagly, Ashmore, Makhijani, & Longo, 1991).

In sum, it appears that dieting and weight concerns are prevalent in western society. A potential source of these concerns may be the apparent increase in social emphasis on a thin body image ideal in women. Evolutionary and developmental factors may exacerbate the effect of the formation of socially accepted female body ideals driving the individual to reduce the discrepancy between their current body image and that of a social ideal. Unfortunately, it is biologically and economically improbable that such ideals can be achieved for prolonged periods of time, especially as their attainment and maintenance goes against human evolutionary history. The combination of social pressures, biological regulation, and the stresses of adolescence are central in establishing normative concerns with dieting, weight and development may eventually lead some individuals to the formation of an eating pathology,

#### **2.4. Stice's model of socio-cultural factors and their relation to bulimia nervosa: The incorporation of restraint, disinhibition, hypnotizability, and dissociation.**

Many of the factors mentioned in the previous section have been incorporated by Stice (1994) into an overall hierarchical framework relating to the development of bulimia nervosa within a socio-cultural framework. Stice's model provides a background for fitting in the hypothetical influences of hypnotizability and dissociation into a validated model of eating disorders, which also incorporates restraint concerns and dieting behaviours. Figure 2.2 illustrates the concepts involved in Stice's model. These concepts represent the principal mediators of bulimic pathology, that is the principle routes via which socio-cultural pressures may transform into bulimia nervosa. As Stice (1994) provides a comprehensive review of the concepts depicted, only a brief overview will be dealt with here. Potential links between the issues developed in Stice's model and the concepts of hypnotizability and dissociation are discussed where appropriate.

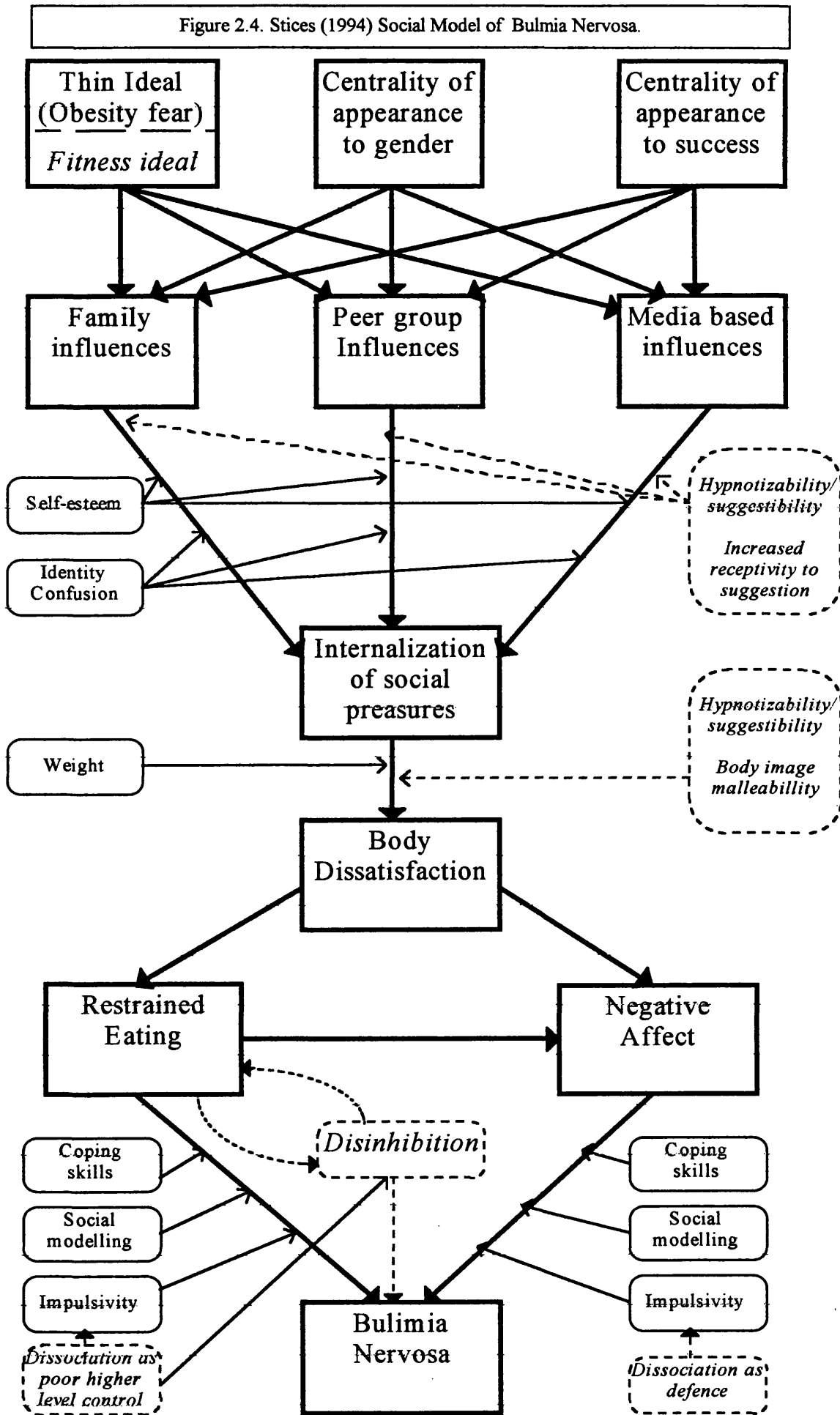
At the highest level of Stice's hierarchy model there are socio-cultural factors that represent pressures placed on individuals related to obtaining a desirable body aesthetic. These pressures are the centrality of appearance to female gender identification, and the importance of attractiveness to success. In addition, a drive towards a fitness and health ideal, a factor related to the thin ideal not mentioned by Stice, has been included in italics as the fitness ideal may be of equal importance given

recurrent suggestions that a thin body is a healthy body (e.g. Brownell, 1991). Fear of obesity or fat phobia may also promote achievement of a thin ideal and has been included as another addition to Stice's model. Social cultural pressures are filtered down to the individual via a number of established social structures or institutions: the family, peer group, and media. Eventually the social pressures become incorporated within an individual's representational system.

Moderating factors such as self-esteem and level of identity confusion may increase or decrease the impact of social level messages on the individual's internalisation of such pressures. Using this perspective as a heuristic foundation, it is proposed in this thesis that hypnotizability, or at least a process underlying hypnotic responding, potentially responsiveness to suggestion, may play a role in promoting increased internalisation of socio-cultural pressures. Increased internalisation may in turn elevate levels of body dissatisfaction and hence restrained eating concerns and/or behaviours, and negative affect.

A basic means of viewing the moderating effect of hypnotizability is by seeing social pressures as representing a form of general suggestion. The extent to which such suggestions are incorporated may well be related to individual responsiveness to suggestions in general, and is potentially tapped by measures of hypnotic suggestibility. Higher levels of hypnotizability should therefore be related to higher levels of restraint concerns. The individual subsequently internalises such pressures initiating a set of potential processes revolving around comparisons between desired body image and perceived body image. It is proposed here that the extents to which socio-cultural pressures are internalised have important repercussions as to the extent of manifest psychological and/or behavioural reactions.

Figure 2.4. Stices (1994) Social Model of Bulimia Nervosa.



Stice proposes that the principal psychological consequence of discrepant desired and self-perceived body image is varying levels of body dissatisfaction. This fits well with mediational models of restraint behaviours suggesting the underlying role of body dissatisfaction in establishing, and potentially disinhibiting eating behaviour. Higher or lower actual body weight may act here as a moderating factor by either increasing or decreasing, respectively, the level of discrepancy involved in the self-world comparison process. By implication, body dissatisfaction requires some comparative referent, and this is provided by the internalised body image ideal filtered down through the higher levels of the hierarchy. In addition to potentially moderating the extent of internalised social pressures, hypnotizability/suggestibility related process might allow for the possibility of a flexible or malleable representation of body image that may contribute to the accentuated discrepancy between ideal and perceived body image. Wybraniec and Oakley (1996) cited in chapter one indicated preliminary results postulating that the capacity for restrainers to subjectively imagining suggested body image changes, especially in terms of increase size and weight, may accentuate differences between ideal and current body perceptions.

Stice proposes two routes from body dissatisfaction to bulimia nervosa, the so-called Dual Pathway model (Stice, 1994; Stice, Schupak-Neuberg, Shaw, & Stein, 1994; Stice, Nemeroff, & Shaw, 1996; Stice, Shaw, & Nemeroff, 1998) The first is via restrained eating, and the second is via negative affect. Stice uses the concept of dietary restraint to refer to actual or current dieting, but as detailed in section 2.3. this presents a confound. None-the-less, both current dieting and dietary restraint fit Stice's model. Restraint eating concerns are an intuitive feature of body dissatisfaction, but are not necessarily expressed in behavioural terms. The non-dieting restrained eater will tend to disinhibit eating given a wide range of conditions, and, depending on which measure is used to assess restrained eating, will generally have a history of dieting concerns and behaviours. This history leaves them vulnerable to disinhibition, potentially formative in the establishment of a new dietary regime. It should be mentioned that Stice leaves out the interaction between restraint and disinhibited eating which is fundamental to the Restraint Model (e.g. Herman & Polivy, 1984) so it is incorporated in figure 2.2 for completeness.

Dissociation has been suggested as another plausible factor that may accentuate possible disinhibition of eating (e.g. Rosen & Petty, 1994; Frاسquilho & Oakley, 1997; Oakley & Frاسquilho, 1998). Dissociation can act as either a defence against negative affect generated via body dissatisfaction or failed restraint, or as a moderator of impulsivity by representing weakened higher level integration of action. The effect of dissociative capacity on impulsivity and as a defence may be very similar.

The second route from body dissatisfaction to bulimia nervosa is via negative affect, or more specifically an affect-regulation pathway. The specific implication is that body dissatisfaction produces negative affect, which serves as a pathway into bulimia nervosa. An aspect of binge eating that is believed to regulate negative affect (e.g. Hawkins & Clements, 1984), by acting as a defensive processes against negative emotionality. Restraint concerns have also been shown to moderate the relationship between the factors of weight dissatisfaction and psychological well being (Tiggemann, 1998), capturing issues such as negative affect, with increased restraint allowing for a higher relationship between these two factors. Given that negative affect may also trigger disinhibition, higher restraint concerns make disinhibition more likely. In addition, failure of restraint may increase levels of negative affect, which in turn leads to potentially disinhibiting eating behaviour in restrained eaters, developing a possibly pathological cycle incorporating binge/purging behaviours. Again the issue of differentiating current dieting from general restraint concerns is important, as current dieters tend to regulate eating when faced with negative affect manipulations (Eldredge, 1993). Dissociation may play a role in regulating negative affect by providing the now familiar defence role, though a number of alternative explanations exist (e.g. Everill, et al 1995).

A number of studies have attempted to validate Stice's model using multivariate modelling techniques to examine aspects of the model. Stice, et al. (1994) demonstrated that level of media exposure related to a high proportion of ideal body images and had a direct effect on level of eating disorder symptoms (tested using the EAT) and gender role endorsement. A more indirect route between media exposure and eating disordered symptoms was mediated by gender role, which predicted ideal body stereotype internalisation, which in turn predicted body dissatisfaction, which finally highly predicted eating disorder symptomology. The fit of this model to the original data was very good.



Another study (Stice, et al., 1996) applied a specific test of the dual pathway aspect of the model based on the restraint and negative affect routes to bulimic symptoms. Perceived social pressure, ideal body internalisation, body dissatisfaction, negative affect, dietary restraint, and bulimic symptomology were all assessed using a confirmatory measurement model to establish the basis for more complex structural equation models. Good measurement model fits allowed the examination of the dual pathway model, which fitted Stice's (1994) original framework, with body dissatisfaction predicting both dietary restraint and negative affect. Negative affect predicted bulimic symptomology, and dietary restraint predicted both bulimic symptomology and negative affect. The overall model also incorporated further significant predictive pathways; predictive links between perceived social pressures to ideal body internalisation, body dissatisfaction, and dietary restraint. Additionally ideal body internalisation predicted body dissatisfaction. The goodness of fit to the original data was very high. Further strong longitudinal support for Stice's (1994) model was provided in another study by Stice, et al. (1998), with the same pathways emerging as Stice et al. (1996).

Overall, Stice's (1994) model has been validated using statistical procedures based on causal modelling analysis and fits theoretical conceptions of social factors that operate throughout its hierarchical framework. The model also stands well with dietary restraint research. However, in validating the original model Stice and colleagues adopted measures of dietary restraint, body dissatisfaction, and bulimic symptomology that are derived from clinical research. This is not a threat to Stice's model, but the issue remains whether similar pathways can be found using alternative measures of restraint, based around more normative and less pathological measures such as those illustrated in section 2.3.

## Problems with Stice's model and final issues for consideration.

Stice's model is only one of a number of models that attempt to describe the risk factors involved in the formation of an eating disorder. Some alternative models have a fundamentally different philosophical approach to the aetiology of eating disorders. There is also more specific evidence for incompatibilities between certain assumptions inherent in Stice's approach and findings examining the role of social pressure and body dissatisfaction in the development of eating disorders. These issues are briefly discussed below as are their impact on the Socio-Hypnotic hypothesis and the Dissociative Escape hypothesis outlined in this thesis.

Socio-cultural models of eating disorders are only one approach to the complexity of eating disorder aetiology. Other major approaches include the involvement of familial factors (e.g. Eisler, 1995) or intraindividual factors such as cognitive processing biases (e.g. Fairburn, Cooper, & Cooper, 1986), and finally biological and genetic factors (e.g. Treasure & Holland, 1989; Treasure & Campbell, 1994). Many of these alternative approaches do not have socio-cultural factors as their focal concerns rather such factors are either seen as important but secondary features of eating disorders, or are placed at the periphery of the respective aetiological framework. Many of these frameworks are not seen to be in direct competition or incompatible with the role of socio-cultural factors, but do greatly reduce the emphasis that researchers such as Stice place on socio-cultural mechanisms of action in the development of eating disorders.

Possibly the biggest challenge to socio-cultural approaches comes from biological models. The biological approaches tend to interpret the core processes in eating psychopathology as potentially inherited appetite related hypothalamic dysfunctions (e.g. Grossman, 1990) and abnormalities in biochemical systems involving endocrine and neuro-chemical functions. At worst, biological models relegate social factors to non-essential cultural feature of a lesion based disease process, which therefore gives little causal value to socio-cultural mechanisms of action. However, biological models can suffer from the problem of assessing whether physiological abnormalities are secondary to dieting behaviours and energy deprivation (e.g. Leung, Geller, & Katzman, 1996), and the extent to which such abnormalities are pre- or post-morbid. In addition, a potential reconstruction in recent biological thinking has begun to

realise the importance of accepting the interaction between socio-cultural and biological models in the potential aetiology of eating disorders (Ward, Tiller, Treasure, Russell, 2000).

Aside from general issues of differences in theoretical orientation, there are particular issues to do with components of Stice's (1994) model that present more specific problems. Stice relies specifically on two major processes that intervene between socio-cultural messages related to a thin ideal and the development of eating disorders; i.e. the internalisation of socio-cultural pressures and the funnelling of such pressures into and through body dissatisfaction. There are potential problems with this funnel type structure. First, there is a need to recognise that environmental pressures to be thin are not sufficient to cause long term eating disorder symptomatology. A number of studies have demonstrated that being in a sub-culture that amplifies the importance of a thin and/or athletic body (e.g. ballet dancers, beauticians) can predispose an individual to levels of eating disorder symptoms greater than those found in the general population (e.g. Garner, & Garfinkel, 1980; Button & Whitehouse, 1981; Hamilton, Brooks-Gunn, & Warren, 1985). These studies appear to support Stice's emphasis on the role of environmental pressures on setting the conditions for possible eating disorder pathology.

However, studies based on sub-cultures where weight and body concerns are accentuated suffer from a lack of causal direction, i.e. they do not differentiate between the role of environmental pressures *per se* and the possibility that individuals already pre-disposed to eating disorders seek to join such sub-cultures. A more serious criticism of the social/environmental pressure model, and hence Stice's model, is that individuals in such environments may only express superficially similarities to actual eating disorder cases, rather than actually exemplifying the core pathology of Anorexia or Bulimia Nervosa (Szumukler, Eilser, Gillies, & Hayward, 1985). In other words, the eating disorder symptoms expressed by professionals in high-pressure weight control environments may well be a function of their career choice rather than an underlying pathological syndrome. Evidence from the study of male jockeys has suggested that whilst they present with extreme restraint, bingeing and purging behaviours, these behaviours disappear off-season, indicating a much less chronic course than commonly found eating disorders (King & Mezey, 1987; Leung, et al., 1996). Even more relevant was the failure of the jockeys to express personality factors usually associated with

eating disorder psychopathology, e.g. negative self-esteem and feelings of inadequacy. Stice's model needs to account for these issues in order to identify itself as an aetiological model that does not confound core pathological features with purely situation based factors.

A second criticism of Stice's models relates to the potentially extreme focus on the process of body dissatisfaction in the generation of eating disorders. Although body dissatisfaction has generally been seen to play a fundamental role in developing eating disorder symptoms, a number of researchers have recently begun to doubt that dissatisfaction with body shape and weight is at the core of eating disorder pathology (e.g. Cooper, 1997). Negative self-beliefs and dysfunctional attitudes towards self-evaluation have been suggested as more prominent aetiological factors in the formation of eating disorders (e.g. Leung, Waller, Thomas, 1999). Unfortunately, these factors tend to be left out of Stice's model.

A third and final problem with Stice's model is its reliance, in part, on the relationships between dietary restraint and bingeing behaviours. The restraint literature reviewed in earlier sections of this thesis (e.g. section 2.2) does support a potential role for restraint concerns and behaviours in the development of disinhibition of eating. However, a recent study by Lowe, Gleaves, and Murphy-Eberenz (1998) showed that at least 25% of their clinical bulimic sample (based on EDI diagnosis and intake interviews) was not dieting to lose weight. These findings threaten to undermine the role of dieting and restraint in the maintenance of bulimic symptoms. The findings also add some doubt to the possible aetiological role of restraint in the formation of binge type disorders. However, as pre-morbid dieting practices were not assessed in Lowe et al's (1998) study it is possible that restraint plays a role only in the development, but not maintenance of eating disorders. For example, once established, bulimics may adopt behaviours other than restraint in order to attempt to regulate their body weight. Such behaviours may include various types of purging.

Despite some of the issues covered above, Stice's model still has value in a number of ways. First, it is a good heuristic model for implementing the Socio-Hypnotic and Dissociative Escape frameworks at the core of this thesis; illustrating one means in which such hypothetical frameworks interact with potential socio-cultural pressures. It is also important to note that these two frameworks do not necessarily rely on the

plausibility of Stice's model in order to be plausible themselves. The role of Socio-Hypnotic factors in the internalisation of restraint and body concerns can still play a compatible role in a number of different models. The possibility that heightened receptivity to suggestion may motivate restraint attitudes and behaviours still forms a working hypothesis in terms of non-clinical eating problems. The possibility that dissociation acts as a defensive mechanism against negative affect and stress that may lead to disinhibition of eating also remains a potential hypothesis in the absence of socio-cultural factors, especially as it focuses on attentional/cognitive factors.

## **2.5. Summary of Chapter two and methodological considerations for the thesis.**

This chapter has illustrated some of the complex themes relating to the definition and measurement of hypnotizability, dissociation, and restraint, in addition to providing a basic introduction to the socio-cultural model in which such concepts may fit. The problems of terminology are rife within the areas examined, and there are confusions that occur based on the differential use of terms, and the implication of such usage. Overall, two general hypotheses emerge from consideration of the literature in chapter one and chapter two. The first is that hypnotizability may act as an index of suggestibility relevant for a socio-hypnotic hypothesis of restrained eating concerns. The second is that dissociation may be related to disinhibition and bingeing phenomena, possible as a defence mechanisms, and/or possibly as a pre-disposition to dissociate that leaves individuals open to lack of higher level control over behaviours and general openness to external suggestion.

As few studies have examined these issues within the non-clinical literature, a good place to start would be by examining if the hypothesised relationships exist between measures of restraint, hypnotizability, dissociation and disinhibition. Investigation of such relationships can help reveal future directions for establishing causal relationships. A primary tool in such a research endeavour is the use of correlational and regression techniques (Multiple Regression and Correlation: MRC, Cohen & Cohen, 1983), which allow the assessment of degree of relationships and consideration of overlapping variance in relation to dependent variables of interest.

Before moving onto the first empirical chapter, an overview of the main measures used throughout this thesis is appropriate. This section acts as a brief outline of the scales formats and basic statistics.

### 2.5.2. Measures of Hypnotizability.

*Harvard Group Scale of Hypnotic Susceptibility: Form A* (HGSHS:A, Shor & Orne, 1962). Amongst the number of hypnotizability scales available, the HGSHS:A is one of the most widely used and has been specially developed for group administration. The scale usually consists of a ten minute induction containing suggestions for progressive relaxation and eye closure, preceded by a non-hypnotic suggestion for the head falling forward, and followed by a further 11 test suggestions. As already mentioned in earlier sections the test suggestions are roughly defined within three different categories, ideomotor, challenge items, and cognitive items, and are listed below (table 2.3) in order of presentation.

The hypnotic amnesia suggestion is assessed by asking participants to recall after de-induction of hypnosis as much as possible of what they were asked to do in the test (i.e. the test suggestions) in 3 minutes. Failure to recall at least three test suggestions is scored as a successful amnesia. The amnesia is reversed using the phrase 'Now you can remember everything' which is a trigger phrase given as part of the amnesia suggestion allowing recall of test items. Participants trying to recall anything they had previously forgotten in a further 2 minutes. The remaining test suggestions are self-scored in a standard response booklet as either passed or failed. Issues concerning the factor structure of the HGSHS:A have been addressed in an earlier section, and so will not be covered here.

The total score for the HGSHS:A is derived summing the number of passed responses, and ranges from 0 to 12. Shor and Orne (1963) found an initial mean of 7.39 using the HGSHS:A with an internal consistency (Cronbach's  $\alpha$ ) of 0.80. Subsequent large scale studies have found means ranging from 5.45 (SD 2.95) in a Australian sample (Sheenan & McConkey, 1979,  $n = 1944$ ) to 6.51 (SD 2.43) in German sample (Bongartz, 1985,  $n = 374$ ).

**Table 2.2.**  
**Hypnotic suggestions used in the HGSHS:A**

Suggestion	Type	Description
1 Head Sway	Ideo-motor	Non-hypnotic, pre-induction item with suggestions of head falling forward
<b>INDUCTION</b>		Eye focus on specific spot on hand, progressive relaxation.
2 Eye Closure <sup>1</sup>	Ideo-motor	Suggestion of heavy eyelids, closing eyes. Part of induction.
3 Hand lowering	Ideo-motor	Heaviness in outstretched hand pulling hand down.
4 Arm Immobilisation	Challenge	Inability to lift up arm from lap.
5 Finger Lock	Challenge	Inability to unclasp fingers.
6 Arm Rigidity	Challenge	Inability to bend outstretched arm.
7 Magnetic Hands	Ideo-motor	Hands drawn together.
8 Communication inhibition	Challenge	Inability to nod head.
9 Fly Hallucination	Cognitive	Hallucinating a fly buzzing around head.
10 Eye Catalepsy	Challenge	Inability to open eyelids.
11 Amnesia	Cognitive	Inability to remember test suggestions.
12 Post-Hypnotic suggestion	Cognitive	Scratch left ear when hearing a tapping noise.

*The Creative Imagination Scale (CIS: Barber & Wilson, 1978/1979):* The CIS is also used as a test of hypnotic suggestibility, when applied with an hypnotic induction. The main purpose of the CIS was to create a scale that was more permissive and less authoritarian, especially in relation to challenge suggestions, than the standard hypnotizability scales such as the HGSHS:A and the SHSS: C. However, the CIS can also be used more as a test of waking suggestibility, as can the Harvard and Stanford scales, when no hypnotic induction is used. The CIS is more cognitively and imagery orientated and based on a set of 10 imagined scenarios, usually preceded with motivational ‘think with’ instructions designed to orient participants towards an active engagement in the process of imagery construction. After the suggestions participants rate the subjective reality of their imagined experiences, in relation to potentially real

<sup>1</sup> Instructions are given to keep eyes shut throughout the procedure.

experiences, on a scale ranging from '0' or not at all the same [as a real experience] to '4' [almost exactly the same as a real experience]. Overall scores are obtained by summing over items to give a possible score between 0 (lowest level of waking suggestibility) to 40 (highest score of waking suggestibility).

The original mean for the CIS (Barber & Wilson, 1978/1979, based on Kiddoo (1977-unpublished conference paper) using no preliminary 'think with' instructions, was 20.8 (SD 8.6) for  $n = 217$ . A number of studies have used the CIS reporting various means close to the original value (e.g. Sheenan, McConkey, & Law, 1978:  $n = 305$ , mean = 20.60, SD 6.90; Suita, 1987:  $n = 111$ , mean = 20.69, SD 7.56; Laidlow & Large, 1997:  $n = 38$ , mean = 20.81, SD 10.7). However, use of 'think with' instructions have been suggested as raise CIS score above these means by increasing the impact of suggestion (Wilson & Barber, 1978; Hilgard, Sheehan, Moneteriro, & MacDonald, 1981), though this has been recent challenged (Laidlow & Large, 1997).

Initial reliabilities for the CIS found reasonable split-half reliability of  $r = 0.89$  (Barber & Wilson, 1978/79,  $n = 217$ ). Factor analysis of the CIS indicated the scale items load on one factor (McConkey, Sheehan, Law, & White, 1977; Barber & Wilson, 1978/79), conceptualised as hypnotic-like susceptibility. Given the earlier discussions about the nature of hypnotic susceptibility, this factor may best be interpreted as imagery related 'waking' suggestibility.

### 2. 5. 3. Measures of Dissociation.

As mentioned previously, two scales are used throughout this thesis as measures of dissociation, the DES II and the PAS. They have been mentioned numerous times throughout these initial chapters, but a brief summary is provided here for ease of access.

*Dissociative Experiences Scale II (DES II)*. The DES II (a revision of the rating format from a visual analogue to a percentage scale: Bernstein & Putnam, 1993) consists of 28 items, each referring to a potential dissociative experience (e.g. "Some people have the experience of driving or riding in a car or bus or subway and suddenly realising that they don't remember what has happened during all or part of the trip"). Participants rate



the frequency of each experience on a percentage scale with responses broken down into increments of 10%.

The scale items were derived from clinical interviews with people diagnosed under the DSM III dissociative disorder category, in addition to consultation with clinical and diagnostic experts. The initial aim of the scale was to capture a continuum of dissociative experiences, ranging from everyday non-pathological dissociation to pathological dissociative phenomena. Such phenomena include experiences related to memory, identity, awareness, and cognition. It is important to note that the DES was originally constructed for use in clinical populations, though it has been widely adopted in non-clinical studies.

Means for the original DES, in non-clinical samples (as reviewed by Carlson & Putnam, 1993), vary from 3.7, (Goldner et al, 1991; control group for eating disorders) to 7.8 (quoted as unpublished data in Carlson & Putnam, 1993). A relatively high mean score of 21.8, SD 12.8 was found in a student sample by Frischholz, et al. (1992). Median values have ranged from 4.4 (Bernstein & Putnam, 1986, original development paper) to 6.4 (Demitrak et al., 1990; non-clinical control group for eating disordered patients). However, in a large non-clinical population sample examination of the DES ( $n = 1,055$ ) by Ross, Joshi, and Currie (1990, conducted as part of a population survey in Winnipeg, Canada) the mean level was found to be 15.6 (SD 12.1) for women and 15.2 (SD 12.7) for men with ages ranging 18-29. As age increased the mean level of dissociative experiences decreased, with a mean DES score in the age cohort 30-39 of 10.3 (SD 8.9) for women and 11.9 (SD 10.2) for men. The mean for the entire sample was 10.8 (SD 10.2). It also appears that general dissociation scale scores are particularly skewed in both clinical and non-clinical populations (Bernstien & Putnam, 1986).

The internal consistency of the overall DES has been reported to be good to excellent including split half (Bernstein & Putnam, 1986:  $n = 73$ ,  $r = 0.83$ ; Pitblado & Sanders, 1991:  $n = 43$ ,  $r = 0.93$ ) and Cronbachs Alpha (Frischholz et al, 1990:  $n = 321$ , whole scale Alpha = 0.95; Fischer & Elnitsky, 1990: Alpha for their DES single 21 item factor = 0.90; Dubester & Braun, 1995: whole scale alpha = 0.96 and 0.97).

The DES has also been used to identify sub-groupings of items that relate to principle factors relating to absorption, de-personalisation/de-realisation, and amnesia,

and different types of dissociation based on normal or chronic pathology. Though mentioned in previous sections, a brief summary of the findings from factor analysis studies follows.

In clinical samples a three factor solution has been readily replicated, with small degrees of variation on the specific item loading (e.g. Carlson, et al. 1991), with amnesia being the principle factor, followed by absorption/imaginative involvement, and finally depersonalisation/de-realisation. Frischholz, Braun, Sachs, Schwartz, Lewis, Shaeffer, Westergaard, and Pasquotto (1991) examined the so-called tri-dimensional structure of the DES, interpreting a non-pathological absorption like dimension, and two pathological dimensions based on amnesia and depersonalisation/de-realisation. They found that the three dimensions were present in both clinical and non-clinical samples, and held a good level of internal consistency (alphas ranging from 0.77 to 0.90). However, the three factor solution has only been found in certain non-clinical studies (e.g. Carlson et al, 1991; Ross, Joshi, & Currie, 1991) with absorption and changeability as a principle factor, followed by depersonalisation/de-realisation, then an amnesia factor. Waller (1993) has suggested that excessive item skew in the DES may create spurious factors, and demonstrated that correcting for skew produced only a one factor solution, similar to Fischer and Elnistky (1990).

An alternative interpretation, and therefore use of the DES is based on more recent work suggesting a more taxonomic aspect of the DES (Waller, Putnam, & Carlson, 1996; Waller & Ross, 1997). This perspective identifies two aspects of the DES, a latent pathological taxon representing possible chronic dissociative pathology, and a more non-pathological factor representing imaginative-absorption type dimensional responses. This re-classification may be more appropriate in elucidating the role of different types of dissociation in relation to features of research interest. This is especially useful as sub-scales derived from taxonomic pathological and non-pathological dissociation can be generated from the original DES and DES II (Waller & Ross, 1997).

*Perceptual Alteration Scale (PAS: Sanders, 1986):* The PAS is another scale used for measuring dissociation, and it is used in this thesis primarily because, like the DES II it has been used before in the investigation non-clinical eating problems (e.g. Rosen and Petty, 1994). Much less work has been done on the psychometric properties of the PAS.

Sanders (1986) initially reported means of 90.2 (SD 16.24) for non-bingeing college students using the full 60 item version. The original reliability for the overall PAS has been recorded at 0.95 for the original 60 item scale, however, subsequent studies have used the 27-item version based on Sander's original paper (e.g. Fischer & Elnitsky, 1990; Rosen & Petty, 1994). A reduced 21-item scale based on the factors extracted from the 27 item scales (Fischer & Elnitsky, 1990) scored a reliability of 0.85. Sanders identified three PAS sub-scales relating to modification of affect (Cronbach's  $\alpha = 0.88$ ), modification of control (Cronbach's  $\alpha = 0.88$ ), and modification of cognition (Cronbach's  $\alpha = 0.70$ ). Each of these sub-scales is assumed to examine some alteration in normal everyday functioning. However, the extent to which these factors are replicable has been questioned (Fischer & Elnitsky, 1990), and use of such sub-scales may require restricting to explorative methods.

#### 2.5.4. Measures of dietary restraint and disinhibition.

Two principle scales are used throughout this thesis as measures of dietary restraint, the cognitive restraint scale of the Three Factor Eating Questionnaire (Stunkard & Messick, 1986: TFEQ cognitive restraint) and the Concern for Dieting sub-scale of the Revised Restraint Scale (Herman & Polivy, 1980: RRS concern for dieting). which cover related but different facets of the restraint construct. The TFEQ also contains two sub-scale relating the disinhibition of eating (TFEQ disinhibition) and susceptibility to hunger (TFEQ susceptibility to hunger or hunger scale) which are detailed briefly below. Again these scales are used as they are the principle scales developed within the dietary restraint literature, and have been used to explore relations between dietary restraint, hypnotic-like suggestibility, and dissociation in previous studies (e.g. Frاسquilho & Oakley, 1997). An excellent review of these and other restraint scales can be found in Gorman & Allison (1995).

*Three Factor Eating Questionnaire (TFEQ):* Developed by Stunkard and Messick as an alternative measure of restraint related behaviours to the RRS, the cognitive restraint sub-scale deliberately avoids mention of disinhibited eating, but rather relies and the disinhibition of eating scale of the TFEQ to provide such information.

*TFEQ Cognitive restraint:* As mentioned in previous sections, the cognitive restraint scale appears to measure both the conscious intention to monitor and regulate eating in

terms of reducing food intake, and a behavioural component related to successful restraint of eating. A number of studies have provided means for the TFEQ cognitive restraint scale, and for women means vary from higher values of 10.2 (SD 5.6: USA college students sample, n = 617; Gorman & Allison 1995) and 13.1 (SD 4.3: German females in weight reduction program, n = 46,132; Westenhoffer, 1991) to lower values of 6.5 (SD 4.7: German women, n = 62; Laessle et al, 1989). There are wide differences in means dependent on nationality, and sample type, so caution is advised in selecting restrainers and non-restrainers based on population norms. Westenhoffer's findings are potentially related to a sample selection bias in that women on weight loss programme will generally be high in restraint concerns and behaviours.

Gorman and Allison (1995) report suggestions for guidelines of 0-10 as low to average restraint, 11-13 as high restraint, and 14 plus as a potential clinical range. Median splits are used in this thesis when restrainers/non-restrainer groupings are sought, but otherwise it appears more sensible to adopt a non-dichotomous approach to the measure and use correlational and regression based analyses.

Overall reliabilities in terms of internal consistency (Cronbachs Alpha) for the cognitive restraint factor for normal weight women are very good to excellent, ranging from .80 (18-30 year old German college women, n = 60; Laessle et al, 1989) to 0.91 (New York college students, n = 823: Allison, et al., 1992).

*TFEQ Disinhibition of eating (loss of control over eating) and TFEQ Susceptibility to hunger.* Few studies have looked specifically at the means and reliabilities of these factors. The original (Stunkard & Messick, 1985) mean of the TFEQ disinhibition factor was 10.0 (SD 5.9), with a Cronbach's alpha of 0.91; and for the TFEQ susceptibility to hunger factor original mean was 7.1 (SD 4.1), with a Cronbach's Alpha of 0.85.

*Revised Restraint Scale, concern for dieting sub-scale (RRS concern for dieting).*

Developed earlier than the TFEQ, the RRS (Herman & Polivy, 1980) was originally intended as an overall measure of chronic unsuccessful restraint. However, as mentioned above in the review of dietary restraint measures, two potentially separate sub-scales have been identified, and concern for dieting sub-scale and a weight fluctuation sub-scale. In this thesis the RRS concern for dieting sub-scale is used

primarily, in order to measure features of chronic concern over the monitoring and regulation of food intake.

Little research has examined the separate psychometric properties of the RRS concern for dieting sub-scale, and the principle studies examining its validity (e.g. Laessle, et al, 1989) tend not to report means and reliabilities. However, some means have been reported ranging from 7.8, SD 3.0 (Wardle & Beales, 1987) to 9.3, SD 4.0 (Gorman & Allison, 1995).

*Body Mass Index (BMI)*: This provides a general measures of adipose fat tissue, and has been widely used in obesity research, and is calculated for each study in this thesis. BMI consists of weight (in Kg) divided by Height (in metres)<sup>2</sup>, with a general value of 30 plus as an indicator of obesity. BMI of 30 and over is used as an exclusion criterion in this thesis, to prevent data from obese participants entering final analyses, as this thesis is primarily concerned with non-obese individuals. Williams et al. (1995) also identified a moderating role of BMI in terms of relationships between restraint and disinhibition, where higher BMI indicates a better correlation between restraint and disinhibition, whilst lower BMI leads to lower correlations between restraint and disinhibition.

#### 2.5.5. Other measures and final issues of importance.

Throughout this thesis other measures are used related to restraint, loss of control over eating, and more general factors such as social desirability. These measures are introduced within their respective chapters, and details of reliabilities and means are given there.

As a final issue, the guidelines for multivariate data analysis suggested by Tabachnick and Fidell (1996) are adopted throughout the empirical chapters. These guidelines include examination of data distributions for excessive skew, kurtosis, and outliers, and the treatment of these problems. Missing data are dealt with, where appropriate, using Cohen and Cohen's (1983) excellent treatment on the issue, and throughout statistics are conducted on variables with and without missing data replacement.

## Ethical Approval.

All studies adhered to the Ethical Guidelines relating to informed consent and proper conduct in relation to experimental procedures involving human participants as published by the University College London Ethics Committee, and were submitted for ethical approval by that committee.

## **2.6. Summary of the principle hypotheses examined in the thesis**

Outlined below are the two principle hypotheses upon which the next four empirical studies are based.

### Hypothesis 1: Socio-Hypnotic Approach to Dietary Restraint Concerns

The Socio-Hypnotic approach adopted in this thesis focuses on how components of suggestibility hypothesised to underlie both waking and hypnotic suggestibility may be related to the internalisation of socio-cultural concerns related to the formation of eating problems. Higher levels of suggestibility are hypothesised as indicative of a greater capacity to hyper-internalise socio-cultural measures related to the motivation to restrain eating, and hence may be a risk factor in developing problematic eating concerns and behaviours associated with dietary restraint.

The Socio-Hypnotic approach is a heuristic position based on non-state views of hypnosis as a form of social phenomena rather than the result of specialised or unique processes occurring as a result of a hypnotic induction. Measures of hypnotic suggestibility should present the same patterns of association with measures of dietary concerns as measures of waking suggestibility. The Socio-Hypnotic approach rejects the overarching single process approaches to hypnosis, especially the principle theories based on dissociation. Instead component processes based on social compliance, the evocation of imagery related cognitions including memory or affective factors and attentional factors, are seen as major components in facilitating suggestibility and hence the internalisation of suggested content. The extent to which hypnotic suggestibility predicts different types of dietary restraint when controlling for factors such as dissociation and social desirability, a variable related to some of the motivation behind compliance, and a variety of other factors related more to eating behaviour (age, BMI,

fears of weight gain, and also body dissatisfaction etc) may be addressed using multiple regression.

### Hypothesis 2: The Dissociative Escape approach to disinhibition of eating.

The dissociative escape hypothesis hypothesises, on the basis work by Heatherton & Baumeister (1991) and later McManus (1995), that a capacity to experience dissociative phenomena may be utilized as a coping mechanism for negative affect and anxiety states. This approach focuses on the defensive nature of dissociation as a distraction from ongoing reality, and is an extension of the possibly normative role of dissociation in everyday life as a cognitive resource saving mechanism. However, the experience of defensive dissociation may prevent a person from monitoring and controlling their behaviour, leaving them open to disinhibiting influences, including the disinhibition of eating. Different types of dissociation may be relevant to this hypothesis, with affective dissociation with its related lack of control over affective reactions may pre-dispose a person to uncontrolled eating behaviours. Also, recent studies (e.g. Waller & Ross, 1997) have suggested that certain forms of dissociative experiences represent underlying pathological tendencies, whereas others may be more related to more mundane everyday imagination. The extent to which disinhibition of eating or other forms of problematic eating attitudes are related to these different types of dissociation forms a basis of this second hypothesis.

In terms of the Socio-Hypnotic hypothesis stated above, dissociative capacity is not necessarily implicated in hypnotic responding and hence may not be directly related to the restraint of eating. Both dissociation and hypnosis may well be involve basic attentional processes, but these may be expressed differently and have different roles and functions. In terms of this second hypothesis it is predicted that dissociation, especially affective dissociation will be related to measures of disinhibition of eating in contrast to measures of dietary restraint. The extent to which dissociation may be a factor influencing the disinhibition of eating beyond other factors, such as initial level dietary restraint, age, BMI, and also fears of weight gain and body dissatisfaction, is explored later using multiple regression procedures.

## **Chapter 3**

### **Study 1: ‘Waking’ suggestibility and suggested body image changes in relation to aspects of dietary restraint, dietary disinhibition, and body anxiety.**

#### **Chapter Overview**

This initial empirical chapter is based upon the use of a measure predictive of hypnotic-like susceptibility, the Creative Imagination Scale (Barber & Wilson, 1978/79), which, it is argued, is also a measure of imagery based waking suggestibility. The CIS is used to examine relationships with aspects of dietary restraint, dietary disinhibition, susceptibility to hunger, and body anxiety. New CIS items were constructed based on suggested changes in body image in order to examine more specific features of suggestions directed at imagining body size increase and decrease, encapsulating a concept termed body image malleability (Frasquilho & Oakley, 1997).

#### **3.1. Introduction to Study 1.**

The major focus of this experimental chapter is on the subjective reality of waking suggestion and imagery based components of the Socio-Hypnotic approach as they are incorporated in Stice’s (1994) Socio-cultural model of disordered eating (see section 2.4). In terms of the Socio-Hypnotic approach to dietary restraint, as an individual’s general level of waking suggestibility increases, then so may their tendency to internalise or incorporate information related to Socio-Cultural dietary restraint concerns related to pressures to be thin. In terms of the putative imagery components of waking suggestibility, as an individual’s capacity to experience imagery related suggestions as subjectively real might augment the individual’s capacity to evoke realistic ‘as-if’ situations (Sheehan, 1979) that may also relate to a potential internalisation (i.e. increased processing) and augmentation of dietary restraint concerns. The general pervasive discontent with body shape and weight (Schwartz et al,



1986; Striegel-Moore et al, 1986) may provide the origin for the hypothesised associations between waking suggestibility and dietary restraint concerns. The Creative Imagination Scale (CIS: Wilson & Barber, 1978/9) was the general measure of suggestibility used in this study. The CIS is generally used as a measure of the subjective reality of non-authoritative image-based suggestions that emphasise active involvement in the process of imagination. The CIS was presented in this study as a measure of waking suggestibility as it was not accompanied by a hypnotic induction, and hence fits the descriptive usage of the term 'waking suggestibility' as defined in section 2.1.8.2 of this thesis.

In addition to using the CIS as an overall measure of waking suggestibility, more specific suggestions were also incorporated that attempted to characterise imagining changes in body size towards larger/fatter or thinner/slimmer directions. These specific body image suggestions go beyond the measurement of pervasive associations with suggestibility and focus on images that may evoke behavioural and/or affective reactions. A predisposition for higher ratings of the subjective reality of such body size suggestions may be positively associated with higher levels of dietary restraint concerns and body related anxiety. The basis for this specific body image hypothesis was again firmly established in the putative imagery components of the Socio-Hypnotic approach, which may help establish 'as if' experiences of body size changes that also activate negative affective self-images and/or memories (see section 2.1.8.3) associated with body anxiety and greater motivation to restrain. Predispositions to experience negative body images as subjectively real may also be related to disinhibition of eating as negative self-realizations, especially to do with body image, may trigger attentional defences that leave an individual open to tendencies to disinhibit eating (Heatherton & Baumeister, 1991).

As the CIS measures the subjectively reality of generated suggested images, it provides a sound measure for 'as if' experiences, both in terms of general waking suggestibility and specific body image factors. The body image items were constructed in the same format and style as the other non-body image CIS items. The measures of restraint concerns used in this study aimed to identify at least two dimensions of the general dietary restraint construct. These dimensions included both chronic concerns with dieting (concern for dieting sub-scale of the Revised Restraint Scale: Herman & Polivy, 1980) and similar motivations based on the cognitive or conscious regulation of

eating (Cognitive Restraint sub-scale of the Three Factor Eating Questionnaire: Stunkard & Messick, 1985). Body anxiety was measured using the Physical Appearance State/Trait anxiety scale (PASTAS: Reed, Thompson, Brannick, & Sacco, 1991). Disinhibition of eating and the related factor of susceptibility to hunger were measured using sub-scales of the Three Factor eating Questionnaire (Stunkard & Messick, 1985). All measures used in this study were based on self-report methods using pen and paper tests.

### Background to Study 1.

In chapter one a number of studies were reviewed which investigated hypnotizability in relation to aspects of clinical and non-clinical patterns of eating behaviours and concerns. Clinical studies revealed a general tendency for significantly elevated hypnotizability in a number of eating disordered groups, particularly individuals with bulimic symptoms. However, hypnotizability itself does not appear to correlate with specific features of bulimic symptoms suggesting that processes involved in hypnotic responding are possibly related to symptom formation rather than actual symptom severity (e.g. Covino, et al, 1994). Symptom formation may be related to factors occurring in non-clinical samples. A small number of non-clinical studies support the relationship between hypnotizability and aspects of dieting concerns and body dissatisfaction (Groth-Marnat & Schumaker, 1990; Frascuilho & Oakley, 1997), with both variables acting as risk factors in developing eating pathology (e.g. Herman & Mack, 1975; Herman & Polivy, 1975; 1980; Polivy & Herman, 1985; Hsu, 1990; Heatherton & Polivy, 1992; Stice, 1994; Riccardelli, Tate, & Williams, 1997).

Chapter two discussed a number of means by which processes underlying hypnotic responding may facilitate the internalisation of widespread socio-cultural concerns to achieve a thin body aesthetic in women. Media exemplars of feminine beauty carry with them suggestions for physical attractiveness and desirable social rewards (e.g. Brownell, 1991; Stice, 1994) which can motivate dieting behaviour by increasing levels of body shape and dieting concerns. The average body weight of such exemplars has been reducing over the past few decades (e.g. Garner & Garfinkel, 1980), leading to particularly salient discrepancies with average population weight which has remained the same and is potentially increasing (Hsu, 1990).

Focusing on non-clinical samples, more specific evidence of the effects of media exposure on psychological well being and dieting concerns comes from a variety of studies. For example, Abramson and Valene (1991) provide correlational evidence that media usage in a non-clinical sample is positively correlated with both dietary restraint ( $r = 0.24$ ), using Herman and Mack's (1975) original Restraint Scale, and marginally with binge eating ( $r = 0.18$ ). In a non-clinical female comparison group, Waller, Hamilton, and Shaw (1992) found that body size overestimation due to exposure to randomly selected pictures of women in fashion magazines, was significantly correlated with dieting ( $r = 0.32$ ) and oral control ( $r = 0.28$ ) sub-scales of the EAT. Television advertisements containing slender women have also been found to disinhibit women who score high on Herman and Polivy's (1980) Revised Restraint Scale (Seddon & Berry, 1996).

Overall, these findings can be interpreted as indicating possible effects of acute and chronic media exposure on body dissatisfaction and dietary concern, that in some situations may lead to disinhibited eating as a possible consequence. Media based manipulations may therefore represent a factor in the maintenance of dieting concerns potentially related to body dissatisfaction. Sensitivity to media images may be related to some form of hyper-internalisation of the thin body ideal represented within such stimuli. Such hyper-internalisation may initiate a set of comparisons between ideal and perceived self that produce body image discrepancies potentially leading to increased body dissatisfaction, increased motivation to restrain, and also disinhibition (Heatherton & Baumeister, 1991; Seddon & Berry, 1997).

The study presented in this chapter was based upon studies by Frاسquilho and Oakley (1997) and Wybraniec and Oakley (1996) and examined two factors of hypothetical relevance to a process of internalisation of dieting and body image concerns. These are an individual's general receptivity to suggestion and specific receptivity to suggested changes in body image.

Frasquilho and Oakley (1997) found a strong positive correlation between a measure predictive of hypnotizability, the Creative Imagination Scale (CIS: Barber & Wilson, 1978/79) and a measure of dietary restraint involving successful dieting behaviours and related intentions (the cognitive restraint factor of the TFEQ: Stunkard & Messick, 1985). As mentioned earlier, the CIS, despite being related to

hypnotizability, may be considered to be more a measure of so-called 'waking' suggestibility when not used in conjunction with a hypnotic induction. However, framing the CIS as a measure of hypnotizability does increase its predictability with more standard measures of hypnotizability (Spanos, et al. 1989). Previous research has not examined if different types of restraint are related to such measures as the CIS, and this study intended to examine such possibilities by adopting two related measures of dietary restraint, which none-the-less examine different features of the construct.

The second concern of this study was to re-examine the concept of specific suggested body changes explored by Wybraniec and Oakley (1996). The capacity to experience body image changes, either somatically or in terms of altered imagery, forms a core feature of hypnotic responding as measured by a variety of scales (e.g. HGSHS: A, SSHS: C). However, changes can also be produced, according to non-state approaches to hypnosis as a result of 'waking' (non-hypnotic) suggestibility. Wybraniec and Oakley investigated whether restrained and non-restrained eaters given suggestions for body image change in larger or thinner directions experienced different levels of subjective reality in terms of the experience of imagining their body increase or decreasing in size. As described in chapter 1 this study found that restrained eaters were resistant to imagining body size decrease suggestions, but were as responsive to body size increase suggestions as they were to neutral suggestions, for which they were significantly more responsive than non-restrainers. Non-restrainers were resistant to both decrease and increase suggestions. These results were almost certainly due to significantly higher levels of waking suggestibility in restrainers compared to non-restrainers. However, there were no direct comparisons between restrainers and non-restrainers in terms of the two suggested body image experiences, or any examination of possible correlates relating to a capacity to image body size changes.

A capacity to experience subjectively realistic body image changes may be a factor in further increasing discrepancies between desired and perceived body size or shape, acting as a facilitator of increased restraint and body dissatisfaction. Furthermore, a capacity for imagining realistic body size *increase* may be associated with increased levels of body anxiety and therefore may be more applicable than body size decrease in motivating restraint behaviours and concerns. An additional hypothesis related to suggested body image change arises from Heatherton and Baumeister's (1991) theory of 'binge eating as an escape from self awareness', also known as the Escape Hypothesis.

Aversive self-realizations related to body anxiety and subjective perceptions of body image may trigger disinhibition of eating in restrained eaters. Such disinhibition is hypothetically related to a defensive attentional shift away from the aversive realizations that also prevents activation of inhibitory process assumed to underlay restraint concerns and behaviours. This approach relates well with Green and Saenzs' (1995) findings that exposure to an unattractive confederate may lead to disinhibited eating in restrainers, possibly due to exposure to an unacceptable possible-self.

In addition to direct comparisons between restrainers and non-restrainers in terms of suggested body image changes, study 1 also made a number of methodological improvements to Wybraniec and Oakley's (1996) study. The initial study used a selection of imaginative scenarios from the overall Creative Imagination Scale (CIS: Barber & Wilson, 1978/79) to measure waking suggestibility, in which the two suggested body image items were placed contiguously, with the body reduction item always placed first. Study 1 utilised the whole CIS. The body image items were placed separately amongst the original CIS items with their order of presentation counterbalanced across participants in order to reduce facilitation of any particular body image. This hopefully reduces increased familiarity with suggested body image items placed later in the scale, though whether an effect still remains needs to be ascertained. Additional measures of dietary restraint concerns, body dissatisfaction, and disinhibited eating were also used to assess possible relationships with specific types of suggested body image change. The presence of aversive self-realizations may also trigger an attention-based distraction process which may leave an individual open to disinhibitory reactions to restraint (Heatherton & Baumeister, 1991), indicating higher levels of disinhibited eating concerns.

To recap on the major hypotheses of this study. It was expected that if waking suggestibility, which as noted can be predictive of hypnotizability, facilitates internalisation of body image concerns, then a positive association should be found between a measure of waking suggestibility known as the CIS and measures of restraint and body anxiety. Heightened receptivity to specific suggested body image changes may be indicative of a capacity to imagine such changes, and may be complexly related to both restraint concerns and body dissatisfaction. If this is plausible, then restrainers compared to non-restrainers may express significantly more realistic responsiveness to suggested body image changes based on suggestions related to the CIS imagery related

format, especially in directions of body increase as this may provide a better source of restraint concerns and motivation for restraint.

### **3.2. Methods**

#### Participants

The participants were 40 female undergraduates from University College London departments of Psychology and Medicine (Mean age 19.0, SD 1.9). All were under 35 years of age, within a range of Body Mass Index (BMI) between 17 and 29 (mean BMI 21.1, SD 2.1), and none had reported any previous medical or psychological treatment for an eating disorder. Informed consent was required before participation in this study.

#### Materials and Apparatus.

Copies of measures used in this and the other studies in this thesis are located in appendix A.. Standard means and reliabilities for each measure are either reported below or have been previously reported in sub-sections of section 2.5 of the previous chapter.

*Participant and dietary demographics.* A demographic questionnaire obtained age, gender, and nationality information. Two separate questions also assessed whether an individual wished to be larger or slimmer (e.g. ‘Do you wish to be slimmer than you are now?’) using a dichotomous response format (yes or no) for each question. Current dieting was assessed using the question ‘Are you currently on a diet to lose weight?’ again using a dichotomous response format. The duration of a current diet in days was also assessed. Two questions also asked if participants had ever dieted (dichotomous response format), and the age of first diet. Participants perceived cultural preference for attractive body size was briefly assessed based on what body size (slim, medium, or large) was most attractive for their culture. Finally, two questions asked if the participant had any current or recent treatment and/or diagnosis for a medical or clinical eating disorder. No specific details were requested and responses to these eating disorder questions consisted of yes/no formats.

*Modified Creative Imagination Scale (MCIS)*. In addition to the ten original items of the CIS (Barber & Wilson, 1978/79: see section 2.5.2), two extra imaginary scenarios were included to represent separate suggested changes in body image towards body size increase and body size decrease. The body image items were the fifth and ninth items in the 12 item MCIS. The general script for each suggested body image item is included as the appendix B. All the MCIS items, including the body image items, were rated by participants on a 5-point Likert-type scale indicating level of subjective reality of each scenario. Possible responses are anchored at 0 (not at all the same as a real experience) to 4 (almost exactly the same as a real experience). Overall CIS scores are obtained by summing over the original ten items, whilst specific scores are obtained for each of the suggested body image items. For overall and body item scores, the higher the score the more subjectively real the experiences were. The overall CIS is scored from 0 to 40, and the suggested body image items responses range from 0 to 4. The overall MCIS was recorded onto standard audiotape to ensure standardisation of presentation across participants. Tapes were played on a standard audio playback system (Sony 'Cassette-Corder', Model TCM-919).

*Revised Restraint Scale (Herman & Polivy, 1980) concern for dieting sub-scale (RRS concern for dieting)*. The RRS concern for dieting sub-scale was used as a measure indicative of chronic dieting and restraining concerns, combined with features of conscious monitoring of eating, and occurrence of private disinhibited eating episodes. The original RRS concern for dieting sub-scale used a variable response format ranging from 4 to 5 response categories, across 6 items. In order to match the number of response categories across all items a 4-point response format was used in this study. The RRS concern for dieting scale has not been little used in isolation from the overall RRS especially not in terms of the 4-category response format, therefore means and reliabilities are not available for direct comparison. However, it should be mentioned that the use of the concern for dieting sub-scale items as a separate measure of restraint has been suggested as a valid procedure (e.g. Blanchard & Frost, 1983; see Gorman & Allison, 1995 for review). Higher scores on this scale indicate higher levels of restraint. Scores for this measure can range from 0 to 16.

*The Three Factor Eating Questionnaire (TFEQ: Stunkard & Messick, 1985)* The TFEQ was used to measure disinhibition/loss of control over eating, susceptibility to hunger, and incorporates a cognitive restraint factor which acts as a combined indicator of

successful dieting intentions and behaviours. The overall TFEQ consists of 51 self-statement items, and is scored in two parts, a true/false format followed by a set of 4-point and 5-point Likert-type items with response categories ranging from 1-to-4 or 1-to-5 representing either frequency statements or level of relevance to self. Responses to the Likert scale are coded in the most symptomatic direction for the factor underlying the item, being scored as either 1 for symptomatic or 0 as non-symptomatic. Higher scores on these measures indicate higher levels of the variable concerned. For previously reported means and reliabilities for each the sub-scales please refer to section 2.5.4.

*The TFEQ cognitive restraint factor* is an indicator of concerns related to successful monitoring and regulation of reduced food intake, also indicative of elements of successful restraining behaviours. The possible range of scores is from 0 to 21. *The disinhibition of eating* and *susceptibility to hunger* sub-scales of the TFEQ measure loss of control over eating and susceptibility or vulnerability to hunger respectively. They share the same item formats as the cognitive restraint sub-scale, with higher score indicating more of the appropriate factor. Possible scores for disinhibition range from 0 to 16, and from 0 to 14 for susceptibility to hunger.

*Physical Appearance State Trait Anxiety Scale (PASTAS: Reed et al, 1991)*. This scale was developed to assess levels of state and trait anxiety related to various body parts. The scale consists of 16 body parts items to which individuals are invited to rate their current (state) anxiety, or their anxiety in general (trait), in relation to each specific body part using a 5-point Likert-type scale ranging from 0 (not at all anxious) to 4 (very anxious). Total scores are obtained by summation over item responses. A further two sub-scales can be extracted based on body fat or weight related areas (e.g. thighs, stomach) and non-body fat areas (e.g. lips, ears). Higher scores again indicate higher anxiety on the particular sub-scale, with scores ranging from 0 to 32. In the original validation sample (Reed et al. 1991) trait body fat and non-body fat scale means were 15.9 (SD 6.0) and 6.2 (SD 4.8) for non-eating disordered individuals. The state scales showed significant variation across different body anxiety manipulations, with body fat related means ranging from 4.0 (SD 5.1) in low state anxiety contexts to 19.2 (SD 7.6) in high anxiety contexts. The non-body fat state scale also showed significant, yet lower, mean variation across contexts, with means ranging from 0.9 (SD 2.0) in low anxiety contexts to 3.2 (SD 4.4) in high anxiety contexts. The original reliabilities were high with Cronbach's  $\alpha$  of 0.88 for the body fat trait scale, 0.82 for the non-body fat



trait scales, with reliabilities ranging from 0.92 to 0.90 for the non-body fat state scale and from 0.82 to 0.86 (Reed et al, 1991).

### Design and Procedures.

In addition to correlational components, this study incorporated experimental manipulations of suggested body image (size increase and decrease) as a within subjects independent variable, and restraint status (restrained vs. unrestrained) as a between subjects variable, in a fully crossed 2x2 mixed design. Restraint status was determined post experimentally on the basis of the two separate measures of restraint, therefore the experimenter was blind to the restraint classification of participants. The dependent variable for the experimental manipulations was the subjective reality of body size manipulations, based upon the MCIS scoring scales, ranging from 0 to 5, with higher score indicating greater subjective reality of images. Presentation of body image conditions was counterbalanced across participants, as was the order of questionnaire administration in relation to the MCIS containing the body size items. Order of presentation of the individual questionnaires was also randomised.

Informed consent was obtained from all participants before administration of measures for a study examining eating habits and creative imagery. Prior to testing all participants were again informed by the experimenter that their data would remain confidential, and that code numbers would be used to insure such confidentiality. The importance of honesty in responding to questionnaires was also emphasised, in relation to the issue of confidentiality. The study materials were then presented. The MCIS was presented to the participants as a test indicative of individuals' responses to hypnosis, but not involving the actual use of hypnosis. Order of particular questionnaire measures was randomised across participants. Before completion of the study participants were weighed using a standard domestic weighing scale (Hanson 'Freestyle') and their height was measured using a standard metric tape measure. Participants were then de-briefed as to the hypothesis of the study and any questions regarding the study were answered.

### Statistical Analyses.

SPSS for Windows (versions 7.5 & 8) were used for the preliminary analysis of data and data distributions. Correlational analyses based on Pearson's product moment were used to examine the degree of relationship between the measures used in this

study. Dis-attenuated correlations<sup>1</sup> were used to control for measurement error potentially related to scale reliabilities. Analysis of Variance (ANOVA) and follow-up Bonferroni corrected t-tests were used to assess differences between restrainers and non-restrainers on the subjective reality of suggested body change items. Unless otherwise mentioned 2-tailed probabilities were adopted in applicable tests.

### 3.3. Results.

#### 3.3.1. Data Distributions and Data Cleaning.

Prior to analysis, all variables were screened for accuracy of data entry and distribution properties. All variables presented with acceptable maximum and minimal values, and had acceptable means, standard deviations, population skew, and population kurtosis. No outliers were present on any of the variables. Criteria for acceptable skew and kurtosis, and identification of outliers were based on Tabachnick & Fidell's (1996) criteria of a standardised score (i.e. z) of over 3.29. There were no missing data.

#### 3.3.2 Overall means and reliabilities.

The overall means and internal reliabilities (Cronbach's  $\alpha$ ) for the measures used in this study are presented in table 3.1.

**Table 3.1.**  
**Means and internal reliabilities of measures.**

Variables	Mean (SD)	Cronbach's $\alpha$
CIS Total ('waking' suggestibility)	24.3 (6.85)	.78
Body Size Increase (CIS)	2.35 (1.36)	*
Body size Decrease (CIS)	1.72 (1.21)	*
Concern for dieting (RRS)	8.02 (3.61)	.84
Cognitive restraint (TFEQ)	9.27 (5.24)	.87
Disinhibition of eating (TFEQ)	8.3 (3.87)	.79
Susceptibility to hunger (TFEQ)	6.7 (3.20)	.75
State Body anxiety (fat - PASTAS)	11.90 (9.42)	.95
State body anxiety (non-fat - PASTAS)	3.07 (3.30)	.71
Trait body anxiety (fat - PASTAS)	18.12 (7.01)	.88
Trait body anxiety (non-fat - PASTAS)	3.07 (3.30)	.75

\* Indicates that no alpha could be calculated as this represents a single item.

<sup>1</sup> Dividing the original coefficient by the square-root of the product of the reliabilities for the measures used, i.e.  $r/\sqrt{(m1 \times m2)}$ , where m1 and m2 are the scale reliabilities. This procedure corrects for reliabilities, but does not alter the original probabilities and therefore is only recommended for significant correlations, and is only applicable to measures that have reliability data available (Cohen & Cohen, 1983).

The standard reliability profiles indicate that a majority of the scales have good-to-excellent internal consistency. The overall CIS in this sample had a slightly higher mean than previous norms. The concern for dieting sub-scale of the RRS reveals good to fair reliability and is around the mean reported for other studies. The cognitive restraint factor for the overall sample is within the low to average range (Gorman & Allison, 1995), and close to the original mean found by Stunkard and Messick (1985), whilst internal reliability is slightly lower than the original alpha. The disinhibition of eating and susceptibility to hunger factors display means slightly below previous samples, with reliabilities also below the original Stunkard and Messick statistics, though reliabilities are still fairly adequate. The body fat scales of the PASTA show excellent reliabilities, but the reliabilities not are as good for the non-body fat scales.

### 3.3.3. Counterbalancing of suggested body image items and test administration.

The effect of counterbalancing both the order of the suggested body items in the MCIS and the order of questionnaire administration was assessed. Separate 2x2 ANOVAs were conducted using the measures of dietary restraint, dietary disinhibition, and body anxiety as dependent variables, and order of test presentation (MCIS first or MCIS second) and body item presentation (e.g. body size increase first or body size increase second) as between group factors. None of the main effects or interactions for either body item or questionnaire presentation were significant, except for a significant main effect for the order of body item presentation in terms of state levels of body fat anxiety ( $F_{1, 36} = 8.95, p = 0.005$ ). Individuals receiving the body increase item second (position 9 of the MCIS), i.e. after the body decrease item (position 5 of the MCIS), demonstrated significantly higher state body-fat related anxiety (mean = 16.00, SD 6.97) than those who received the decrease item second (mean = 7.8, SD 9.92). Slightly higher cognitive restraint scores were found in those who received the body size increase item second, i.e. in position 9 (10.85, SD 4.75) compared to those who received the decrease item second (7.7, SD 5.37), but this was not significant ( $F_{1, 36} = 3.71, p = 0.062$ ).

Individuals who received the MCIS before the questionnaires were treated as a separate sample to those who filled in questionnaires first, and separate analyses were conducted on these samples using unrelated t-tests with order of body items in the

MCIS used as a grouping factor. No significant differences of item order were found for those that received the questionnaires followed by the MCIS. However, there were significant differences due to body item order for those who filled in the questionnaires immediately after exposure to the MCIS. Significantly higher scores on state body-fat anxiety occurred for individuals who's MCIS had the body increase item placed in position 9 of the MCIS, i.e. after the body decrease item (State body-fat:  $t_{18} = -3.04$ ,  $p = 0.007$ ; body increase item after decrease: mean body fat anxiety = 18.10, SD 8.69; body decrease after increase: mean body fat anxiety = 7.73, 7.05). Significantly higher scores were also found on the two non-body fat anxiety scales when the body increase item was second (both state and trait show identical results:  $t_{18} = -2.41$ ,  $p < 0.05$ ; body increase item second: mean non-body fat anxiety = 5.00, SD 3.92; body increase item first: mean non-body fat anxiety = 2.00, SD 3.92). These findings suggest that despite a number of MCIS items intervening between the last body item and presentation of the questionnaires, when the last body item presented is body size increase, scoring on the body anxiety scales is affected especially in terms of elevating state body anxiety, which is higher than the overall sample mean for these scales.

#### 3.3.4. Participant and dietary demographics.

In terms of dieting demographics, Chi squared tests indicated that significantly more participants wished to be slimmer than not (80%, 32/40;  $\chi^2 = 14.4$ ,  $p < 0.001$ ), and significantly less women wished to be larger than not (97.5%, 39/40;  $\chi^2 = 36.1$ ,  $p < 0.001$ ). In addition, there were significantly fewer women currently on a diet to lose weight than women who were not dieting (87.5%, 35/40;  $\chi^2 = 22.5$ ,  $p < 0.05$ ). However, a significantly large proportion of women had gone on a weight loss diet at some time in their lives (70%, 28/40;  $\chi^2 = 6.4$ ,  $p = 0.011$ ), with the mean age of first diet being 14.85 (SD 2.17). In terms of perceived cultural preferences for attractive body size, the predominant perceived attractive size was thin (87.5%, 35/40), with a small percentage indicating medium as a culturally attractive body size (12.5%, 5/40), whilst no participant believed large was a culturally attractive body size. Body size preferences were significantly different ( $\chi^2 = 22.5$ ,  $p < 0.001$ ), with only the slim item exceeding chance levels.

### 3.3.5. Correlational analysis of ‘waking’ suggestibility and suggested body image changes, in relation to dietary restraint and body anxiety.

#### Suggestibility measures in relation to dietary restraint and disinhibition measures.

Correlational analyses were conducted to examine the main hypotheses of potential positive association between both the CIS and subjective reality of the body change scenarios (suggested increase and suggested decrease) in relation to the two measures of restraint used, concern for dieting and cognitive restraint. Disinhibition of eating and susceptibility to hunger were also included in this analysis. Slade (1982) has suggested that age, BMI, and actual weight may be specifically important covariates in terms of self-perceived body image, and hence may play a role in the determination of suggested body change effects. Partialling out age, BMI, and weight did not lead to significant changes in the magnitude or significance of the correlations. Table 3.2. shows the unpartialled correlations, based on Pearson’s product moment coefficient. Given the moderate number of correlations, a conservative criterion for significance, using each measure of suggestibility (the overall CIS, and the two body image items) to calculate Bonferroni corrections, was applied to ameliorate possible increased Type I error rates. Correlations are 2-tailed.

The CIS total was strongly associated with concern for dieting type of restraint, but not for cognitive restraint, disinhibition of eating, susceptibility to hunger, or current dieting. Suggested body size increase was associated strongly with both concern for dieting and cognitive restraint measures of dietary restraint, with a moderate to strong correlation with the disinhibition of eating measure. Suggested body decrease was related to concern for dieting only, but failed to reach significance when using the corrected alpha value for comparison. It is notable that being on a weight loss diet did not correlate with any of the suggestibility measures.

**Table 3.2.****Correlations between suggestibility measures and dietary restraint related factors**

Suggestibility measures	Concern for dieting	Cognitive restraint	Disinhibition of eating	Susceptibility to hunger	Current dieting
CIS total	.58** (.71**)	.37	.24	.07	.07
Suggested body increase	.60**	.54**	.43**	.27	.29
Suggested body decrease	.31	.17	.23	-.18	.02

\* $p < 0.01$ , \*\* $p < 0.001$ . All  $p$  values are 2-tailed. Figures in brackets represent dis-attenuated correlations.

Bonferroni corrections applied for each type of suggestibility measure at  $p = 0.01$ .

The effects of counterbalancing presentation of the MCIS and the questionnaires on the above correlations were also examined. No changes were noted when the MCIS was presented first and then followed by the questionnaires. However, changes from table 3.2. did occur when the MCIS was presented last, i.e. after questionnaires. There was a slight increase in correlation between the CIS (original items only) and the cognitive restraint factor that was marginally non-significant ( $r = 0.47$ ,  $p = 0.037$ ). Also, the correlation between suggested body increase and disinhibition of eating was reduced and became non-significant ( $r = 0.32$ ,  $p = 0.175$ ), though this may be due to reduced power as these correlations were based on an  $n$  of 20. Partialling out age, BMI, and weight did not change these findings.

Counterbalancing the order of body items within the MCIS led to differences from table 3.2., but only when the increase item was presented after the decrease item. The correlations between the CIS and the restraint measures increased in magnitude (concern for dieting:  $r = 0.69$ ,  $p = 0.001$ ; cognitive restraint:  $r = 0.57$ ,  $p < 0.009$ ), with the correlation between cognitive restraint becoming significant. The body increase item also correlated more strongly with the restraint scales (concern for dieting:  $r = 0.70$ ,  $p < 0.001$ ; cognitive restraint:  $r = 0.74$ ,  $p < 0.001$ ). However, the correlation between the body increase item and disinhibition became non-significant ( $r = 0.42$ ,  $p = 0.062$ ), again possibly due to decreased power.

Suggestibility measures in relation to body anxiety scales.

The same suggestibility measures were also examined in relation to aspects of body anxiety relating to state and trait dimensions for body fat and non-body fat areas. Table 3.3. shows these correlations. The total CIS and trait body fat anxiety correlation was marginally significant ( $p = 0.012$ ) based on 2-tailed  $p$  at 0.0125 due to Bonferroni corrections calculated separately for each suggestibility measure. Suggested body size increase correlated with both state and trait body fat anxiety measures. Partialling out age, BMI, and weight did not substantially affect the original correlations.

**Table 3.3.**

**Correlations between suggestibility measures and measures of body anxiety**

Suggestibility measures	State body Anxiety		Trait Body Anxiety	
	Body fat	Non-body fat	Body fat	Non-body fat
CIS total	.29	.21	.39	.21
Suggested body increase	.54**	.42	.63**	.42
Suggested body decrease	.19	.03	.24	.03

\* $p < 0.01$ , \*\* $p < 0.001$ . All  $p$  values are 2-tailed. Bonferroni corrections applied for each type of suggestibility measure at  $p = 0.0125$ .

Taking into account test counterbalancing (MCIS/questionnaires), when the MCIS was presented first no correlation was found between the body increase item and state body fat anxiety ( $r = 0.47$ ,  $p = 0.062$ ), which was originally significant. No other general changes occurred when the MCIS was presented either before or after the questionnaires, and partialing out BMI, age, and weight did not alter these findings.

In terms of counterbalancing positioning of the body image items within the MCIS, when the decrease item was presented after the increase item state body-fat related anxiety marginally failed to correlate with the body increase item ( $r = 0.47$ ,  $p < 0.035$ ). Again, this contrasts to findings in table 3.3 in which counterbalancing was not accounted for. In the same item ordering context (body decrease item after increase item), the body decrease item again failed to correlate significantly with either the state body fat anxiety scale ( $r = 0.60$ ,  $p = 0.05$ ) or the trait body fat anxiety scale ( $r = 0.60$ ,  $p$

= 0.05). No other changes were found. Again, partialling out age, BMI, and weight had no effect on the correlations.

In relation to counterbalancing, order of test administration had some, but generally minimal impact, but ordering of body items in the MCIS did affect subsequent correlations, especially in making salient associations between body size decrease and body fat related anxiety.

### 3.3.6. ANOVAs of suggested body image change by restraint groupings.

In order to examine specific differences between restrainers and non-restrainers ANOVAs were used with restraint as a between subjects factors and direction of suggested body change as a within subject factor to examine differences in subjective reality of body image scenarios and any interactions by restraint. Groupings into restrainers and non-restrainers were conducted on the basis of two median split procedures to obtain separate restraint/non-restraint groupings (representing restraint status) for each of the restraint scales used i.e. concern for dieting (median = 8.0) and cognitive restraint (median = 8.5). Participants with scores at the median value were excluded to create more balanced grouping sizes, and widen the difference between restrainers and non-restrainers. Again, following Slade's (1982) suggestions, differences between restrainers and non-restrainers on the basis of age, BMI, and actual weight were analysed using independent t-tests, with no significant differences found (Concern for dieting groups: age  $t_{32} = -0.05$ ,  $p > 0.05$ ; BMI  $t_{32} = -0.94$ ,  $p > 0.05$ ; weight  $t_{32} = -0.75$ ,  $p > 0.05$ ; Cognitive restraint groups: age  $t_{38} = 0.12$ ,  $p > 0.05$ ; BMI  $t_{38} = -0.32$ ,  $p > 0.05$ ; weight  $t_{38} = -0.41$ ,  $p > 0.05$ ). Mean levels of subjective reality of suggested body changes for restrainers and non-restrainers are presented in figure 3.1. for each type of restraint measure. For concern for dieting there were 18 non-restrainers and 16 restrainers presenting slightly unequal group sizes, and for cognitive restraint there were 20 restrainers and 20 non-restrainers.



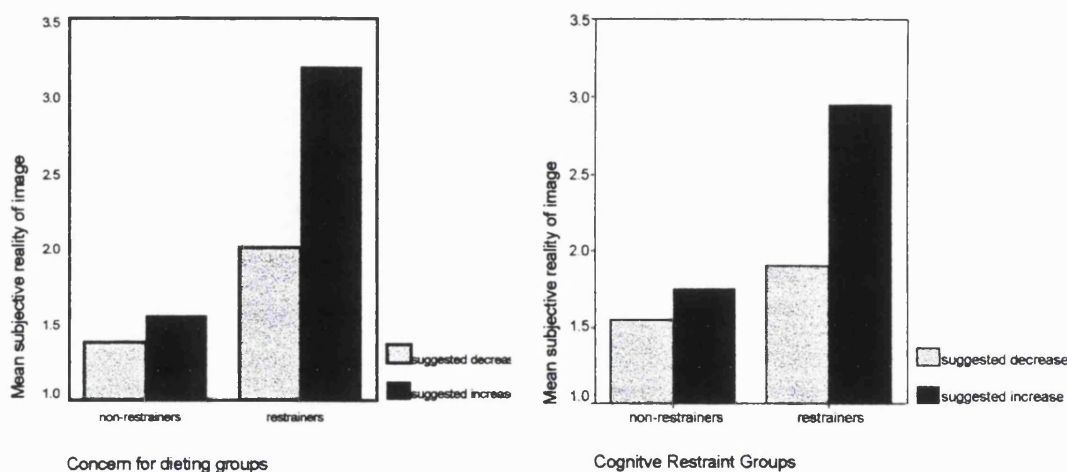


Figure. 3.1. Graphs indicating level of subjective reality for suggested body image change scenarios in relation to different types of restraint groupings.

Mixed 2x2 ANOVAs (restraint grouping by suggested body image change) were used to examine the subjective reality of suggested body image change, one ANOVA for each type of restraint (concern for dieting and cognitive restraint). Type III sums of squares were used for determining corrections between main effects and interactions, as this method is applicable to both balanced and unbalanced designs. For the overall ANOVAs similar results were obtained for each type of restraint, with significant main effects for restraint status (Cognitive restraint:  $F_{1, 38} = 5.41, p=0.025$ ; Concern for dieting:  $F_{1, 32} = 12.24, p=0.001$ ) and reality of subjective body changes (concern for dieting:  $F_{1, 32} = 8.43, p<0.01$ ; Cognitive restraint:  $F_{1, 38} = 9.55, p<0.005$ ). Significant interactions terms were also found in both ANOVAs (Concern for dieting:  $F_{1, 32} = 4.79, p<0.05$ ; Cognitive restraint:  $F_{1, 38} = 4.42, p<0.05$ ).

Post hoc tests, using Bonferroni corrected t-tests (for each ANOVA corrected  $\alpha$  value is 0.0125) further examined the interactions present in the above ANOVAs. Restrainers in the concern for dieting grouping experienced significantly more realistic body size increases compared to non-restrainers (restrainers mean = 3.1, SD 0.9; non-restrainers mean = 1.5, SD 1.2; unrelated  $t_{32} = -4.46, p<0.001$ ). However, there were no significant differences between concern for dieting restrainers and non-restrainers in terms of imagined body size decrease (restrainers mean = 1.38, SD 1.0; non-restrainers mean = 2.0, SD 1.3; unrelated  $t_{38} = -1.5, p>0.14$ ). Very similar results were found for the cognitive restraint groupings with restrainers experiencing significantly more realistic images of body size increase than non-restrainers (restrainers mean = 2.9, SD

1.2; non restrainers mean = 1.7, SD 1.2; unrelated  $t_{38} = -3.05$ ,  $p < 0.005$ ). Again, there were no differences between restrainers and non-restrainers in the experience of body size decreases (restrainers mean = 1.9, SD 1.1; non-restrainers mean = 1.5, SD 1.3; unrelated  $t_{38} = -0.9$ ,  $p > 0.05$ ).

Differences in terms of 'waking' suggestibility between restrainers and non-restrainers were examined for both types of restraint measure. In terms of cognitive restraint, restrainers, compared to non-restrainers, were, as predicted, more responsive to waking suggestion ( $t_{38} = -1.95$ ,  $p = 0.029$ , 1 tailed: restrainers CIS mean = 26.35, SD 5.67; non-restrainers CIS mean = 22.20, SD 7.46). For concern for dieting groupings, restrainers had significantly higher levels of 'waking' suggestibility ( $t_{38} = -3.46$ ,  $p = 0.0005$ , 1 tailed: restrainers mean = 28.25, SD 5.80; non-restrainers mean = 21.0, SD 6.33).

### 3.3.7. Effects of counterbalancing procedures on suggested body image change in relation to restraint groupings.

In order to assess the impact of the counterbalancing for body item order and test administration (either MCIS first or questionnaires first) counterbalancing order for items and administration were added as additional between subjects factors to the ANOVAs conducted in the previous section. The  $2 \times 2 \times 2$  ANOVAs (restraint status x direction of suggested body image change x test order x body image item order) revealed a more complex picture. In terms of cognitive restraint based ANOVAs main effects of restraint status ( $F_{1, 32} = 6.21$ ,  $p = 0.018$ ) and direction of body image change (BIM:  $F_{1, 32} = 8.97$ ,  $p = 0.005$ ). However, while a near significant interaction was found for BIM and restraint status ( $F_{1, 32} = 3.90$ ,  $p = 0.057$ ,  $p > 0.05$ ), there was also a nearly significant interaction between restraint status and ordering of body image items ( $F_{1, 32} = 4.03$ ,  $p = 0.053$ ). Though not achieving conventional levels of significance examination of the profile plot for these interactions (Figure 3.2.) is revealing. Both plots show similar patterns in that non-restrainers show little difference between increase and decrease whereas restrainers show higher levels of subjective reality for increase than decrease. However, while non-restrainers show no significant differences between increase and decrease regardless of body item ordering (increase followed by decrease:  $t_8 = 0.232$ ,  $p > 0.05$ ; decrease followed by ncrease:  $t_8 = 1.41$ ,  $p > 0.05$ ), the restrainers only showed significant differences between increase and decrease when the increase

item was followed by decrease (increase followed by decrease:  $t_8 = 0.68$ ,  $p > 0.05$ ; decrease followed by increase:  $t_8 = 3.84$ ,  $p = 0.003$ ).

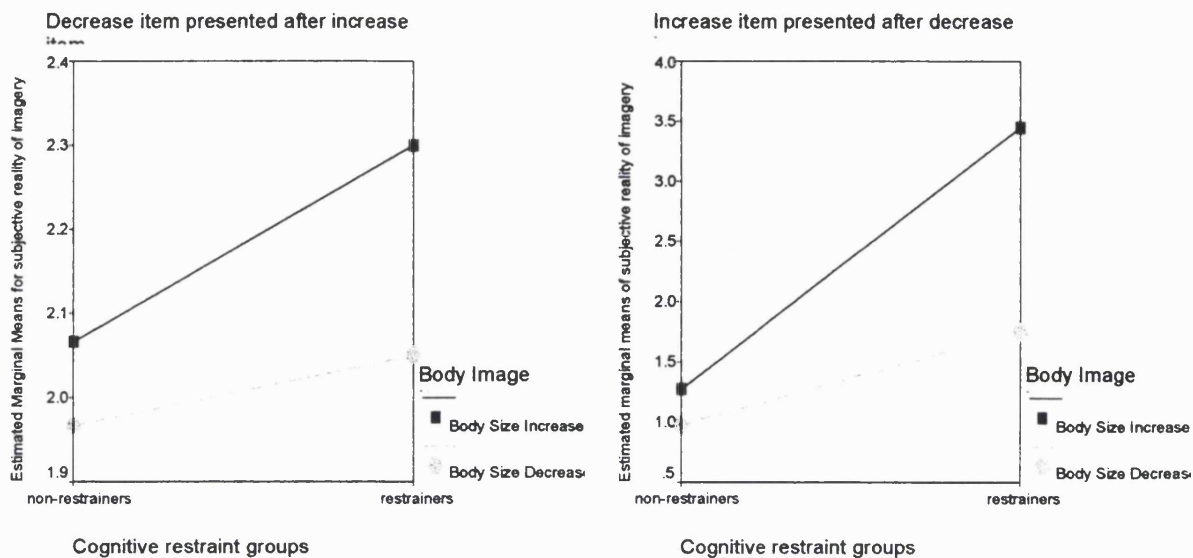


Figure. 3.2. Profile Plots of the subjective reality of body image changes in relation to restraint status and order of body image items in the MCIS.

In terms of order effects, the cognitive restrainers were significantly better at experiencing body size increases when the last exposure they had to a body image item was one that involved body size increase. There was no effect of body image item order on non-restrainers. No significant further first or second effects order were found with test type administration, suggesting that this effect was not moderated by the order in which the two types of tests were administered i.e. whether the MCIS was first and then the questionnaires, or whether the MCIS was after the questionnaires. Simple Bonferroni correction ( $0.05/4$ ,  $\alpha = 0.0125$ ) did not alter the above findings.

In terms of the concern for dieting ANOVAs, a similar, yet more clear-cut result emerged. Again there were main effects of the direction of suggested body image change (BIM:  $F_{1, 26} = 7.06$ ,  $p = 0.013$ ) and restraint status ( $F_{1, 26} = 14.97$ ,  $p = 0.001$ ). However, a significant first order interaction between the direction of suggested body image change and order of body image items in the MCIS (BIM by MCIS item order:  $F_{1, 26} = 6.23$ ,  $p = 0.019$ ) and second order interaction between with these factors and restraint status (BIM by MCIS item order by restraint status:  $F_{1, 26} = 4.38$ ,  $p = 0.046$ ) prevents a straight forward interpretation of these main effects.

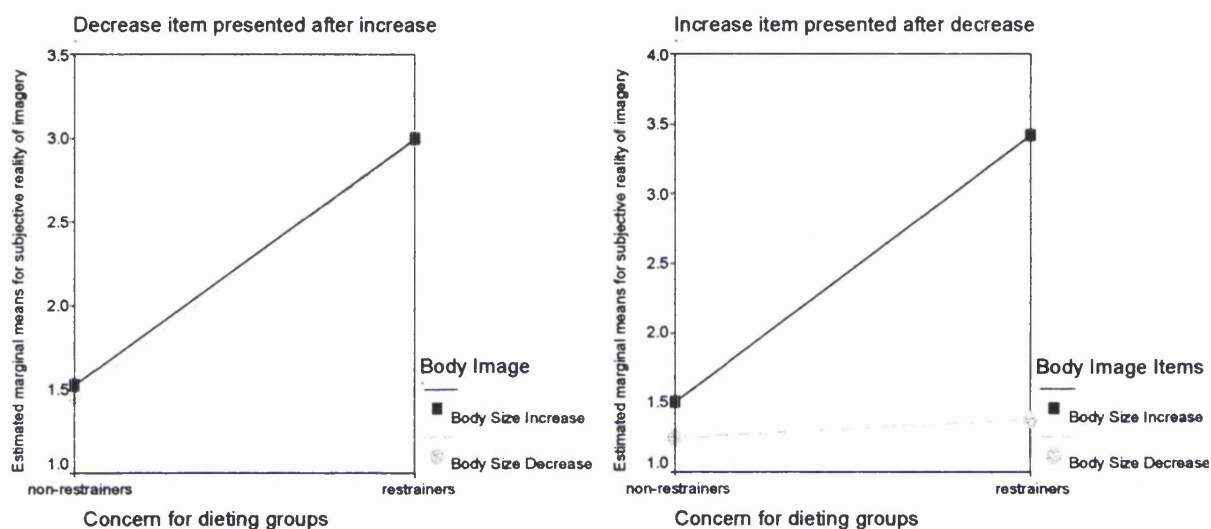


Figure 3.3. Profile Plots of the subjective reality of body image changes in relation to restraint status and order of body image items in the MCIS.

Examining the profile plots of these interactions (Figure. 3.3) helps to clarify these findings. When the body increase item is presented first, followed by the body size decrease item non-restrainers are typically low on the subjective reality of both body size increase and body size decrease with no significant difference between the subjective reality for each item ( $t_9 = 0.20$ ,  $p > 0.05$ ). Restrainers are higher on the subjective reality of both body size increase and body size decrease, with no significant difference in terms of subjective reality of each item ( $t_9 = 0.60$ ,  $p > 0.05$ ). However, when the body size increase item is presented after the body size decrease item a clear difference occurs, but only in restrainers as they experience significantly more subjective reality for body size increase compared to decrease ( $t_9 = 3.94$ ,  $p = 0.003$ ). Non-restrainers show no such difference ( $t_9 = 1.58$ ,  $p > 0.05$ ). Again, simple Bonferroni correction ( $0.05/4$ ,  $\alpha = 0.0125$ ) did not alter the above findings.

It appears that the order in which participants are presented with the body size suggestions interacts with their restraint status, and this interaction is more marked when individuals are categorised as restrainers in terms of concern for dieting restraint as opposed to cognitive restraint.

### **3.4. Discussion of study 1.**

The expected relationship between overall waking suggestibility and dietary restraint was partially supported, but only in relation to chronic features of concern for dieting. The hypothesised relationships between the reality of suggested body image changes was better supported for body size increase in relation to chronic restraint concerns, cognitive regulation of restraint, disinhibition of eating, and body fat related anxiety. Examination of restraint classification in relation to responsiveness to the different body image suggestions clarified previous findings (e.g. Wybraniec & Oakley, 1995) that suggested restrainers are more predisposed to experience body image changes as more subjectively realistic than non-restrainers, regardless of the measures of restraint status. The interaction between restraint status and direction of body size changes indicates that body size increase is again the most salient feature of the capacity to experience malleability in body image. However, differences in order of counterbalancing makes the above interpretations more complex. The results are discussed in more detail below.

A central concern of this study was the examination of general and specific waking suggestibility effects in relation to aspects of dietary restraint, disinhibition, and body anxiety. The first stage in assessing this concern was examination of inter-correlations. The overall waking suggestibility measure, the CIS which measures the subjective reality of suggestion based on imagery involvement, correlated with concern for dieting. This partially supports the socio-hypnotic hypothesis for the potential influence of suggestibility type factors on concerns with dieting, relating to the possible mediating effect of suggestibility in the transmission of socio-cultural attitudes towards body shape and dieting. However, contrary to Frasquilho and Oakley's (1997) findings, the measure of waking suggestibility, the overall CIS, was not significantly correlated with the cognitive regulation of restraint as measured by the cognitive restraint scale of TFEQ (Stunkard & Messick, 1985). Also, the overall CIS did not correlate with

measures of dietary disinhibition, or measures of body anxiety. These patterns of results initially imply that general Socio-Hypnotic type components, especially based on imagery factors assumed to underlie the CIS, are narrowly related to a history of dietary restraint concerns, and not to the actual cognitive regulation of eating or disinhibition related factors including body related anxiety. In terms of the overall socio-cultural model used in this thesis, the general role of waking suggestibility may be more related, as hypothesised in previous sections (e.g. 2.4), to earlier formation and/or internalisation of dietary concerns and not symptomatic features of disinhibition.

Another aspect of the study was to examine the relationship between specific suggestions for imaginary change in body size, and features of dietary restraint, dietary disinhibition, and various types of body related anxiety. The capacity to experience realistic changes in body image in response to external suggestions, a phenomena named body image malleability (Frasquilho & Oakley, 1997), may act as a general index of responsiveness to other forms of social suggestions related to body image. Use of a more specific suggestion, based on the subjective reality of increase in body size, did reveal correlations with chronic restraint, and unlike the correlations involving the overall CIS, also found strong positive relationships with cognitive regulation of eating, disinhibition of eating, and body-fat related anxiety. These patterns of association were only found with the body size increase suggestions as the body size decrease suggestion failed to correlate with any of the dietary restraint and body anxiety measures.

The significant association between suggested body size increase and the different types of restraint examined in this study may be indicative of a number of different processes. For example, a general motivational component in both concern for dieting and cognitive restraint measures may be associated with a capacity to experience imagined body size increase. Alternatively a specific feature of chronic dieting concerns is the tendency to disinhibit eating which may result from attempts to escape from aversive self-awareness (Heatherton & Baumeister, 1991) of a possible overweight self encapsulated within the body increase scenario. The fact that suggested body size increase correlated moderately with disinhibition of eating and with state/trait levels of body fat related anxiety lends support for a potential escape from aversive self-realisation hypothesis. These interpretations support a hypothesis about the formation of concerns with dieting, specifically focused on a motivation to not become overweight or fat, as opposed to a symptom/behaviour enactment hypothesis. On the other hand, the

capacity to imagine a subjectively real body size increase may be a result of prolonged concerns with dieting and repeated exposure to actual weight fluctuations involved in chronic dieting behaviours.

If one assumes that suggested body size increase is related to body image anxiety, as supported by the correlation with state and trait body-fat anxiety, then a potential hypothesis emerging from these correlational findings is that a tendency for active involvement in body anxiety related imagery may provoke the actual experience of body anxiety. This fits in well with issues discussed in previous sections (2.1.8.3) relating to the imagery components of the Socio-Hypnotic hypothesis. Specifically, the experience and enactment of suggestions 'as if' they were real (Sheehan, 1979), and the potential activation of imagery related perceptions and memory. As the body size decrease suggestions did not correlate with any of the restraint or disinhibition measures, indicating that capacity to imagine a body size closer to a 'thin ideal' does not necessarily play a role in either dietary restraint or disinhibition. However, due to the correlational nature of the findings, it is impossible to uncover the direction of the above associations. The capacity to experience negative body images may be due to a pre-existing feeling of anxiety with ones body, rather than be involved in causing actual feelings of body anxiety. A measure of state changes in body anxiety before and after presentation of suggested body image increase would help determine the potential causal direction.

Indeed, these correlational findings as a whole need to be taken with caution, not only because they cannot imply causality, but also because there appears to be an effect of counterbalancing test and body image item administration on the significance and magnitude of correlations. Certainly, the issue of reduced power cannot be excluded in interpreting loss of correlations due to examining order effects, as the sample size is effectively reduced in their exploration. Counterbalancing effects were found, with the overall waking suggestibility measure (CIS) demonstrating significant correlations between the CIS and both restraint measures when questionnaires were presented before the audio-tapped MCIS (which also contained the body image items). Counterbalancing effects of CIS correlations were also present in terms of the order of body image items in the MCIS (suggested body size increase and body size decrease). The original CIS total scores again correlated with cognitive restraint and concern for dieting when the body increase item was placed later in the MCIS than the body decrease item.

In terms of the specific body size suggestions, when counterbalancing for test administration (questionnaires/MCIS, i.e. CIS including body image items) is accounted for there was a loss of significant association between suggested body size increase and disinhibition of eating. This only occurred when the MCIS measure, which contains the body increase item, was presented after the questionnaires. A tentative hypothesis stemming from this finding is that presenting the MCIS body suggestion items before the questionnaires, which led to a significant correlation between body size increase ratings and disinhibition, may have led to a re-evaluation of participants' level of dietary disinhibition in the light of the subjective reality of a possible disinhibiting self. For example, after participants' experience the imagined reality of an aversive self-image, i.e. after exposure to the MCIS with its body increase suggestion, they may answer the TFEQ disinhibition items more affirmatively given their current state in which they may be experiencing body related anxiety previously associated with disinhibition of eating (Heatherton & Baumeister, 1991). Presenting the MCIS after the questionnaires prevents any accentuated imagery-related affect from influencing their initial questionnaire responses. However, such a defensive related evaluation is not supported by the lack of correlation between body size increase ratings and state body-fat anxiety when the MCIS was presented after the questionnaires, which would be expected if the MCIS exposed individuals to negative state-related affective body experiences.

The role and hence implications of counterbalancing on the above correlations cannot be fully assessed in this study. Comparing the mixed effects of counterbalancing, in terms of both counterbalancing of test measures (questionnaires and MCIS), and MCIS item content (body increase or body increase item last), would potentially lead to low power as the number of participants in each specific condition would be very low ( $n = 10$ ). The presence of potential counterbalancing effects implies a need to be cautious about test administration, possibly due to priming type effects. The possibility remains that presenting questionnaire and suggestibility in the same session may influence the subsequent correlations. Such carryover effects may be ameliorated by using separate testing sessions.

ANOVAs examined the second concern of this study which was to examine how restraint status (being either a restrainer or non-restrainer) and responsiveness to the direction of suggested body image changes might mediate and moderate the subjective



reality of body image malleability, i.e. capacity to image body image changes. Analysis of differences between different types of restrainers in relation to ratings of subjective reality of body image suggestions showed significant interactions with type of body image suggestions. Without taking account of counterbalancing, the examination of responsiveness to body image suggestions was straightforward. The subjective reality of body image suggestion in restrainers was particularly elevated, especially in terms of the suggested body size increase which was being experienced by restrainers as on average 'much the same as reality' compared to non-restrainers. Restrainers, defined either in terms of concern for dieting or cognitive restraint were significantly better at experiencing body size increase than decrease, whilst restrainers and non-restrainers were both resistant to imagining body size decrease. It appears that both a chronic history of dieting concerns and successful cognitive restraint both relate, as the correlation evidence suggests, to increased capacity to imaging body size increase.

Overall, restrainers, regardless of the measure used to categorise them, showed an interaction with body image suggestions indicating a preference for experiencing body size increase suggestions as subjectively real. These interactions add further support that imagery factors may be associated with dietary restraint concerns as predicted by the Socio-Hypnotic approach to dietary restraint. The interactions are perhaps the product of previous body weight change experiences due to repeated cycles of dieting, which are activated by imagery inherent in the body image suggestions. This may link into future motivational urges to maintain successful control over dieting (cognitive restraint). The possibility remains that the cognitive processes required to establish good imagery processing may be effective in promoting both the control and concern over dieting/restraint behaviour.

The issue of counterbalancing furthers our understanding of the processes linking suggested body image changes and features of restraint classification. In fact, the issue of order effects can be better assessed within an ANOVA context, where order effects can be coded as independent variables and reveal some important features of what processes are involved when counterbalancing occurs. The effect of test administration order (MCIS and questionnaires) was not present, either as a main effect or with interaction. However, the order of body items in the MCIS did marginally interact with restraint status in terms of cognitive restraint groupings, but more substantially in the concern for dieting groups. In terms of cognitive restrainers,

presentation of the body size increase after body size decrease appeared to augment the subjective reality of body size increase. Although this suggests a priming type effect, the augmentation was specific to body size increase. Such an effect was not present when the body size decrease item was the last one exposed to, i.e. presenting body size decrease last did not prime or accentuate the reality of body size decrease items.

Interaction effects are much clearer when concern for dieting is used as a grouping medium. When the body size decrease item is presented after the increase item the subjective reality of suggested increase and decrease are near identical, for both restrainers and non-restrainers. For restrainers, however, when the body size increase item is the last suggested body change item exposed to there appears to be a slight augmentation of the subjective reality of body size increase, but more importantly the subjective reality of body size decrease shows no elevated subjective reality. Perhaps these results suggest that for those with higher concerns with dieting a more recent exposure to body size increase suggestions prevent high scoring on the body size decrease item. This can occur because the MCIS is rated after exposure to all the items, rather than a separate rating being taken for each item immediately after exposure. If such an effect is occurring then it may be related to different body image schemas present in restrainers and non-restrainers, potentially due to previous exposure to fluctuations in body size.

What the above ordering effects may suggest is a selective memory effect for the capacity to recall subjective reality of body image items, with more recent exposure to body size increase suggestions overshadowing responses to body size decrease items. This is difficult to access without immediate ratings after the body size items. Another interpretation of the order effect is that recent exposure to body size increase may activate a process where the differences between the subjective reality of more thin/slim images and fatter/heavier images are accentuated. This process widens the gap between more ideal (thin/slim) selves and more potentially disturbing possible selves (fat/thin), and may be a process related to disinhibition of eating and negative affect related cognitions. Another related hypothesis concerning these order effects would be that restrainers might be biased towards expecting to rate body size increase items as more real than decrease items. This approach fits better for the cognitive restraint groups and for the non-counterbalanced results. However, this explanation does not account for the identical responses to both body image items for concern for dieting restrainers who

received the body size decrease item after body size increase (Figure 3.3). It is clear that the effects of recent exposure may play an important role in teasing out what imagery processes are occurring in restrainers and non-restrainers.

Before concluding, some issues surrounding the samples demographic characteristics should be discussed. In terms of sample characteristic, the participants' dietary demographics indicated that a significant majority of them had dieted at some time in the past, with the mean age of first dieting being in their early teenage years, a time of frequent social and maturational pressures. The demographics also suggested a statistically significant desire to be slimmer, with only very few individuals desiring to be larger. These results support the suggestion made by Striegel-Moore et al (1986) and others (e.g. Schwartz et al, 1986; Hsu, 1990) for a pervasive 'normative discontent with body size and weight'. Such support may only be indirect as these dietary demographics did not tap 'discontent' related affect features of desires to be slimmer. However, while these findings may implicate a desire for weight loss, very few participants were currently on diets to lose weight. This apparent discrepancy may indicate that weight loss dieting may not be a prevalent behaviour in this specific college sample. Alternatively, such findings may indicate a social desirability bias in terms of admitting to being on an actual weight loss diet, an implication of which is that an individual may be overweight.

In general, the demographic data clearly support a culturally attractive body size to be perceived as being in the thin, as opposed to the medium region. This demographic preference question acted as an assessment for the cultural expectations of attractiveness present in this sample to see if they were in line with the apparently pervasive concept of the thin body attractiveness ideal present in western society (e.g. Garner & Garfinkel, 1980; Stice, 1994).

To conclude, this study supports the potential importance of imagery based suggestions, both in a general and specific sense, for understanding aspects of restrained eating concerns and potential behaviours. Not only was a general capacity to experience suggested imaginary scenarios related to features of dietary restraint and greater in restrainers, but more specific body size increase also related to features of restraint, disinhibition, and body anxiety. The relationships with body fat anxiety, specifically in terms of a capacity to image realistic body size increase also support this approach.

Possible interpretations of order effects found for both the correlations and ANOVAs may be indicative of further complex cognitive process related to the recency of exposure to particular suggestions. Such interpretations may involve issues of memory recall, and potential encoding biases, which may be related to differences in schematic biases between restrainers and non-restrainers, depending on the type of restraint examined. The measures used in this study showed good to excellent reliabilities, and generally were close to previous means. The average score for the CIS tends to be higher than other findings, which may be indicative of a sample bias, though the source of such a potential bias is open to speculation.

## Chapter 4

### **Study 2: Hypnotizability, dissociation, dietary restraint, and dietary disinhibition: A preliminary investigation of associations.**

#### **Chapter overview.**

The previous chapter examined relationships between a 'waking' suggestibility measure predictive of hypnotic-like experiences and two measures of dietary restraint, which focused on either concern for dieting or cognitive restraint. This chapter extends the examination of those dietary restraint measures in relation to a direct measure of hypnotic suggestibility. Scales measuring dissociation are also introduced in order to examine potential relationships between different types of dissociation and features of restrained and disinhibited eating.

#### **4.1. Introduction to study 2.**

A basic feature of the Socio-hypnotic approach to hypnotic suggestibility is that suggestibility in both waking and hypnotic contexts is based on the same component processes, including compliance, imagery, and a variety of cognitive aptitudes (section 2.1.8.3). In terms of a Socio-Hypnotic approach to dietary restraint concerns, the hypothesised influence of suggestibility on the internalisation of such concerns (section 2.4) predicts similar patterns of association for both waking and hypnotic suggestibility in relation to the dimensions of dieting and restraint concerns. If such an approach is true, then the relationships found in chapter 3 between the waking suggestibility measure and aspects of dietary restraint, specifically chronic dieting concerns, should be replicated when using a traditional measure of hypnotic suggestibility. The Harvard Group Scale of Hypnotic suggestibility: Form A (HGSHS:A: Shor & Orne, 1962) was used in this study to measure hypnotic suggestibility. The HGSHS:A is a widely utilized group assessment of hypnotizability, adopting an induction based on attentional fixation and progressive relaxation. More importantly, the HGSHS:A has been used in previous studies to examine relationships between hypnotizability and problematic eating behaviours (Groth-Marnat & Schumaker, 1990).

One of the hypothetical underlying components of the Socio-Hypnotic approach was identified as compliance or conformity to social pressure (section 2.1.3.8). If compliance features as a component of the Socio-Hypnotic approach, then significant positive correlations should be found between hypnotic suggestibility and pressures to comply or a tendency to perform socially desirable actions. The Social Desirability Scale (Crowne & Marlow, 1960), a measure of potential motivation to present a socially desirable self, was included in this study to examine such associations. A further reason for including a measures of social desirability was the potential confounding role it plays between hypnotizability and dietary restraint concerns, especially as social desirability may also play a role in the motivation to restrain eating in order to achieve a socially desirable self (e.g. Stice, 1994) and hypnotic suggestibility.

An alternative hypothesis to the Socio-Hypnotic approach is that hypnotic suggestibility does not operate using the same processes as waking suggestibility, relying instead on the presence a special 'trance' state that augments suggestibility in the hypnotic context. A major candidate for the mechanism underlying a 'trance' interpretation has been the role of dissociation (e.g. Pettinati et al, 1984; also see sections 2.1.6.2 to 2.1.6.4). The extent to which dissociative processes may be operating may be measured, to a certain extent, by self-report measures of dissociation. However, as previous findings have indicated that hypnotizability and dissociation experiences are un-correlated, it is hypothesised that correlations will not be found between hypnotic suggestibility and dissociative experiences, and hence not support a trance interpretation of hypnotizability. In this study, different types of dissociation were measured, using the Dissociative Experience's Scale II (Carlson & Putnam, 1993) as a measure of cognitive dissociation, and the Perceptual Alteration Scale (Sanders, 1985) as a measure of affective dissociation. The relationship between hypnotic suggestibility and dimensions of dietary restraint were also examined independently of both dissociation and social desirability using regression procedures including these variables.

Finally, before examining the empirical and theoretical background of this study in more detail, the role of dissociation in potentially influencing disinhibitory eating was assessed. It was hypothesised throughout chapter 1 and chapter 2 that a predisposition to dissociative experiences may leave an individual vulnerable to using such experiences as an escape from negative self-awareness. This type of escape response may lead to

disinhibition of eating in some individuals (Heatherton & Baumeister, 1991; McManus, 1995). This hypothesis was examined by correlational analyses of the dissociation measures in relation the disinhibition of eating scale of the TFEQ (Herman & Polivy, 1980), the same measure used in study 1 (chapter 3). It was also possible that different types of dissociation may differentially associated with disinhibition of eating, as a tendency to dissociate affective experiences or lose control over such experience may leave a person more vulnerable to aversive self-realizations and therefore more open to the disinhibition of eating. The different measures of dissociation cited above were used to assess possible differential relationships between the disinhibition of eating and different types of dissociation.

### Background to Study 2.

Study 1 indicated that cognitive restraint and chronic concerns for dieting may be related to hypnotic-like experiences, but the measure of such experiences used, the CIS, tends to be more related to imagination based 'waking' suggestibility and not to hypnotizability as traditionally measured. In contrast, this study utilised a widely used group measure of hypnotizability to assess if significant correlations are present between hypnotizability and the two types of restraint examined in study 1, i.e. cognitive restraint and concern for dieting. A central motivation for this study was the exploration of the Socio-Hypnotic hypotheses detailed throughout chapters 1, and 2. To briefly recap, the Socio-hypnotic hypothesis suggests that hypnotizability, or features underlying hypnotizability, may act as an index of responsiveness related to the internalisation of social pressures motivating restraint concerns and behaviours. In line with this hypothesis, correlations between hypnotizability and types of restraint would not only act as indicators that hypnotizability relates to internalised social pressures, but may also indicate that hypnotizability mediates and/or moderates the internalisation and subsequent formulation of restraint concerns (e.g. Groth-Marnat & Schumaker, 1990; Covino et al, 1994).

Previous non-clinical studies (e.g. Groth-Marnat & Schumaker, 1990) have found moderate relationships between hypnotizability, various fears of fat and weight gain, and general patterns of problematic eating attitudes and behaviours. Such relationships have been interpreted as evidence for the potential influence of hypnotic responsiveness on the internalisation of socio-cultural motivations to restrain eating.

However, no studies to date have specifically examined hypnotizability in relation to different types of *dietary restraint* measures, especially concerns related to either successful cognitive restraint over eating or restraint related concerns based more on unsuccessful dieting. In addition, no studies have examined if currently being on a diet to lose weight is related to hypnotizability, i.e. if motivations potentially influenced by features related to hypnotic susceptibility are acted out.

Examining different features of the dietary restraint construct, related to factors such as concern for dieting and cognitive restraint, allows a broader examination of potential patterns of association that may emerge in relation to hypnotizability. If associations are found between hypnotizability and both measures of restraint, then hypnotizability may be associated with general restraint motivations that putatively underlie both scales, supporting Groth-Marnat and Schumaker's (1990) hypotheses. However, differential patterns of correlation between hypnotizability and the two types of restraint may be indicative of potential differences in underlying processes. For example, if hypnotizability were only related to concern for dieting then a version of the Socio-Hypnotic hypothesis may hold. In such a case hypnotizability may act as an index of hyper-internalised social pressures to be thin subsequently expressed through chronic restraint concerns. Alternatively, if correlations were only found with the cognitive restraint factor, a measure in part indicative of successful restraint, then cognitive control factors that some researchers perceive as related to higher levels of hypnotizability (Crawford & Gruzelier, 1992; Crawford, Brown, & Moon, 1993; Crawford, 1994) might help maintain cognitive control over eating.

A second concern of this study was to introduce the examination of disinhibited eating and susceptibility to hunger in relation to different types of dissociation. Rosen and Petty (1994) have provided some evidence that affective dissociation, and to a lesser degree cognitive dissociation, correlate with bulimic tendencies in non-clinical samples. However, the types of eating patterns examined by Rosen and Petty tended to be related to pathological factors, and hence may have captured relationships unique to eating psychopathology. Rosen and Petty's use of more pathology orientated measures may have increased correlations with dissociation, a view supported by the tendency for clinical studies to find higher levels of dissociative experiences in individuals with bulimic symptoms compared to non-clinical control groups (e.g. Demitrak et al, 1990; Goldner et al, 1991; Covino et al, 1994; Everill et al, 1995; Vanderlinden et al, 1995;



McManus, et al. 1995; and Dalle Grave, et al. 1996). The current study examined less clinical levels of disinhibition, that do not necessarily represent abnormal eating patterns or attitudes, in order to identify potential non-clinical relationships between dissociation and disinhibited patterns of eating.

Frasquilho and Oakley (1997), using a non-clinical student sample, found a moderate to strong link between cognitive dissociation as measured by the Dissociative Experiences Scale II (DES II: Carlson & Putnam, 1993), and measures of disinhibition/loss of control eating, and susceptibility to hunger. In examining the hypothetical link between dissociation and disinhibited eating, and attempting to partially replicate Frasquilho and Oakley's (1997) findings, it seemed plausible to examine different types of dissociation related to either affective or non-affective experiences. The DES II and the Perceptual Alteration Scale (PAS: Sanders, 1986) have been proposed as measuring these different features of dissociation, i.e. loss of cognitive control and loss of control over affect, respectively (Fischer & Elnitsky, 1990).

A substantial theoretical motivation exists to examine loss of affective control dissociation and potential relationships with disinhibited patterns of eating. As mentioned in previous chapters, Heatherton and Baumeister's (1991) Escape Hypothesis suggests that binge eating results from loss of inhibitory control over behaviour, with such loss of control being a consequence of affective reactions to aversive self-awareness. Given this perspective, coupled with the potential defensive role of dissociation in guarding against aversive experiences (e.g. Spiegel, 1986; Cardeña, 1994), increased experience of, or vulnerability to, loss of affective control dissociation may subsequently leave individuals vulnerable to disinhibited patterns of eating, especially if such eating is triggered by affective factors. These theories have emerged from clinical domains, but as disinhibited eating, dissociation, and restraint concerns may also occur in non-clinical populations there is a possibility that such processes are relevant to non-clinical forms of disinhibition of eating. Significant patterns of association between disinhibited eating and these different types of dissociation can help identify which types of dissociation may play a role, if any, in the disinhibition of eating in non-clinical individuals.

However, dissociation may not be the monolithic construct suggested by overall scores on dissociation scales. Both the PAS and DES II measures of dissociation also

report a number of sub-scales measuring apparently different dimensions of dissociation, although not all researchers agree on the validity of these sub-scales (e.g. Fischer & Elnitsky, 1990). In this study, potential dissociation sub-scales were used in addition to the overall dissociation scale scores in order to differentiate types of dissociation scale items that may be related to disinhibited eating. Also, the DES II has been reported as containing separate items that relate to non-pathological and pathological types of dissociative experiences, i.e. the pathological taxon and non-pathological absorption/imagination sub-scale (e.g. Waller, Putnam, & Carlson, 1996). Examination of these DES II typologies can help identify the extent to which latent dissociative pathology is related to disinhibited eating in a non-clinical sample.

Socially desirable responding also is an important confound when dealing with questionnaire research in general, in addition its hypothesised relationship with compliance aspects of hypnotic suggestibility. Socially desirable response sets may be especially relevant to measures of dietary restraint that are likely to be the outcome of complex networks of social pressures. Given these potential confound a measure of social desirability was also incorporated in the study, not only to examine potential relationships with hypnotic suggestibility, to also to identify and statistically control for response biases in the general measures. Social desirability, which can also be interpreted as the extent to which individuals respond in 'culturally sanctioned ways' (Crowne & Marlow, 1960), may also relate to participants' willingness to engage in hypnotic behaviour, which arguably has a strong cultural compliance component.

## **4.2. Methods**

### Participants.

The original participants were 97 female undergraduate students from the various departments at University College London, answering a request for paid volunteers in a study of hypnotizability, personality, and problem eating habits. As histories of eating disorders may distort findings within a non-eating disordered sample data from individuals were included only if they had no previous diagnosis and/or treatment of a psychological or medical eating disorder (2 cases excluded). Data from individuals with BMIs over 30 or under 16 were also excluded from subsequent analysis as such extreme values fall well outside the normal range of population BMI and may

indicate obesity and/or potential anorexia respectively (4 cases). Individuals with an age over 3.29 standard deviations from the sample mean were also excluded from further analysis in order to maintain a relatively homogenous age range (3 cases excluded). The final sample prior to analysis consisted of 88 participants.

### Materials and Apparatus

As with the previous study, copies of the self-report measures used in this study are available in Appendix A.

*Participant and Dietary Demographics Questionnaire.* This was same demographic questionnaire used in study 1 to obtain information about age, gender, desire to be larger, desire to be slimmer, current dieting status, previous and current dieting history. Perceived cultural preference for attractive body size was also assessed (slim, medium, or large). Brief questions relating to the occurrence of previous or current episodes of clinical or medical related eating problems were also included. The answer formats for the above questions were identical to those used in study 1, i.e. dichotomous yes/no responses, polychotomous responses (slim/medium/large), or continuous scales (e.g., age, age of first diet.).

*Harvard Group Scale of Hypnotic Susceptibility: Form A (HGSHS:A; Shor & Orne, 1962).* The HGSHS:A is a widely used measure of hypnotizability that can be administered in group settings, incorporating an initial hypnotic induction followed by 12 test suggestions. Test suggestions are displayed in table 2.2. of section 2.5.2. The induction and suggestions were recorded on standard audio-tape for standardisation and presented using an audio-tape player (Sony 'Cassette-Corder', Model TCM-919). Responses to test suggestions were recorded using the standard HGSHS:A response sheet with a pass/fail format for each suggestion. Total hypnotizability scores are obtained by summing the number of passed items, with higher scores indicating higher hypnotizability, giving a possible score range from between 0 to 12.

*The Marlow-Crowne Social Desirability Scale (SDS: Crowne & Marlow, 1960).* The SDS has also been known as a 'liar' scale, but tends to indicate a pre-disposition to give self-report answers that present oneself in a positive way. The scale consists of 33-items based around a dichotomous response format (True/False), with each item representing

a self-statement e.g. 'No matter who I talk to I am a good listener', with which the participant is invited to agree or disagree with. One of the possible answers for each item is designated as the most social desirable. Higher scores indicate more endorsement of socially desirable attitudes and behaviours, which indicates a greater potential bias towards answering questionnaires in a manner that presents the individual in the most social desirable way in relation to item content. Scores can range from 0 to 33.

*The Dissociative Experiences Scale II (DES II: Carlson & Putnam, 1993).* The DES II represents a percentage scale version of the original DES visual analogue scale (Bernstein & Putnam, 1986), and taken as an overall measure purports to measure a continuum of dissociative experiences, tending to relate more to cognitive control dimensions of dissociation (Fischer & Elnitsky, 1990). Total DES II scores are obtained by summing item responses and then dividing by the number of items to obtain a figure indicative of the overall frequency of dissociative experience. Item and total scores range from 0% to 100%. The higher the total percentage the greater the frequency of dissociative experiences. Non-clinical sample means and reliabilities for this scale are presented in section 2.5.3 of chapter 2, but a briefly repeated here for ease of access. Means for the DES (upon which the DES II is based) have varied from 7.8 to 3.7 (Carlson & Putnam, 1993), though higher scores have been reported at around 15.60 (SD 12.1: Ross et al, 1990, female only sample) to 21.8 (SD 12.8: Frischholz et al, 1992). Reliability for the overall scale has been found to be good, with Cronbach's  $\alpha$  ranging from 0.90 to 0.97 (Carlson & Putnam, 1993).

A number of Factor Analytic investigations using clinical and non-clinical samples have indicated three general sub-scales within the DES II based on dissociative amnesia, depersonalisation and de-realisation, and absorption (see Carlson & Putnam, 1993 for a review). These sub-scales can be used in the same fashion as total scores to generate percentage values indicating levels of specific dissociative experiences. More recent research (e.g. Waller et al., 1996; Waller & Ross, 1997) suggests the DES II can identify two *types* of responders related either to non-pathological absorption and imagination dissociation or to more pathological dissociative experiences. These dissociative types can be identified by scores on two sub-scales of the DES II referring to pathological and non-pathological experiences. Again, sub-scales derived from these different item types can be used to identify degree of non-pathological and non-

pathological experience in the same fashion as overall item and total scores. Higher percentage scores on the various DES II sub-scales indicate greater experience of the relevant dimensions.

*The Perceptual Alteration Scale (PAS: Sanders, 1986).* The PAS is a less widely used scale of dissociation that putatively measures a variety of dimensions principally related to loss of control and affective related dissociation. The PAS used in this study was derived for Sander's original (1986) article, and contained 27 items based on three factors extracted from a 60-item scale, and therefore may well represent the most interpretable items from the original 60-item measure. The three factors extracted measured features of modification of affect, modification of cognition, and modification of control. Participant ratings on the PAS consist of Likert-type frequency estimates for particular dissociation items, with the frequency ratings anchored at 1 (never) to 4 (Almost always). Total PAS scores are obtained by summing over item responses, with higher values indicating greater dissociation.

Preliminary means and reliabilities for the PAS have been presented in section 2.5.3, but are displayed here for convenience. The original 60-item scale reliability for the overall PAS has been recorded at 0.95. A reduced 21-item scale used by Fischer & Elnitsky (1990) scored a reliability of 0.85. Means have not been generally available for the 27-item PAS. The three PAS sub-scales have good internal consistency: modification of affect, Cronbach's  $\alpha = 0.88$ ; modification of control, Cronbach's  $\alpha = 0.88$ , and modification of cognition, Cronbach's  $\alpha = 0.70$ . Each of these sub-scales is assumed to examine some alteration in normal everyday functioning. Sub-scale scores are obtained by summing over items, with higher scores indicating higher dissociation. Modification of affect scores range from 12 to 48, modification of control scores range from 4 to 40, and modification of cognition scores range from 5 to 20.

*The RRS concern for dieting sub-scale (Herman & Polivy, 1980).* As in study 1, the RRS concern for dieting sub-scale was used as a measure of dietary restraint indicative of chronic concern for dieting including overeating and monitoring of food intake. This scale used the same 4-point response format as used in study 1. Higher scores indicate higher concern for dieting, with total scores ranging from 0 to 18.

*The Three Factor Eating Questionnaire (TFEQ: Stunkard & Messick, 1986)*. The TFEQ is used to measure cognitive restraint, disinhibition of eating, and susceptibility to hunger. Higher scores on each of these sub-scales indicate greater levels of the factor concerned. The cognitive restraint factor is a measure of conscious awareness of restricting control over food intake, possible scores range from 0 to 21. The disinhibition of eating factor measures the extent to which individuals lose control over their eating behaviours, with score ranging from 0 to 16. The susceptibility to hunger factor measures openness to hunger signals related to eating, and vulnerability to eating based on hunger. Scores for the susceptibility to hunger scale range from 0 to 14.

### Design and procedures.

A correlational design was used with order of questionnaire randomised across participants and testing sessions. Participants were informed that this study examined general aspects of hypnotizability, personality and thinking styles and that measures of problematic eating attitudes and behaviours would also be included. Participants were informed that hypnotizability would be measured in a separate session as it was part of a different, yet related study. Informed consent to participate in both sessions was obtained from all participants before questionnaire measures were handed out, and participant's confidentiality was maintained by using code to record participation rather than names. No identifying features were placed on questionnaires.

Questionnaire measures were subsequently handed out in envelopes. The questionnaires specific to this study were included within a battery of other questionnaires packets associated with another study being conducted at the UCL hypnosis unit examining different information processing styles. Questionnaires were completed in 30 to 40 mins. Participants were tested in small groups of between 3 and 10, in a lab room at the University College London Psychology Department. Height and weight were measured with permission of the participant in a private cubicle after the questionnaires were completed. All participants agreed to have their heights and weights measured. Participants were paid £3 for answering questionnaires.

Hypnotizability was assessed between 5 to 8 days later. Informed consent was again obtained for the hypnotizability procedures. This was followed by a brief standard preamble intended to allay anxiety about hypnosis, especially emphasising that

participants would not be asked to perform tasks that are generally considered embarrassing and that hypnosis is more a feature of ordinary psychological processes and not a special phenomenon. Participant questions relating to the hypnosis procedures were answered by paraphrasing the preamble content as closely as possible. Once participants had no more questions and indicated they were happy to proceed the HGSHS:A tape was played, including the induction, test suggestions, and de-induction. After completion of the tape participants were given the HGSHS:A response booklets to record their responses to the test suggestions. Participants were tested in the UCL Psychology Department in groups varying from 2 to 10, in a quiet room different from that used in the questionnaire sessions. Hypnotizability testing lasted approximately one hour and ten minutes, after which participants were paid £4 for participation. The investigator de-briefed subjects as the nature of the hypnotizability procedures and assessed any apparent disorientation effects due to the testing procedure.

### Statistical Analyses.

The commercially available Statistical Package for the Social Sciences (SPSS, versions 7.5, 8.0, and 9.0) was used for general statistical analysis, consisting of initial examination of data distributions for skew, kurtosis, non-normality, univariate outliers, and multivariate outliers. Missing data substitution was also conducted using SPSS 7.5/8.0 prior to statistical analysis, with serial mean replacement used as the principle procedure. Missing data was also coded as a group variable to assess possible non-random effects.  $\chi^2$  was used to examine differences in responses to nominal dietary demographics related to affirmative or non-affirmative responding to questions based on current dieting, desire to be larger, desire to be slimmer, and having ever dieted. Parametric correlational techniques, based on Pearson's product moment correlation, were used to assess degree of relationships between variables. Standard multiple regression analysis was used to assess each predictors' contribution to variance in the criterion variable of interest, when all other variables are controlled. Semi-partial correlations were used, where appropriate, in order to identify the unique contribution of a predictor variable of interest (e.g. dissociation and/or hypnotizability) to a criterion variable once variance from other variables was removed from the predictor variable. A basic form of path analysis was used to assess a simple model of mediation between dietary restraint, dissociation, and dietary disinhibition. This path analysis used nested

regression models to map out significant patterns of prediction based on standardised regression coefficients (Betas,  $\beta$ ) between relation patterns of variables.

### 4.3. Results.

#### 4.3.1. Data distributions and data cleaning.

Prior to analysis, variable scores for age, BMI, hypnotizability, dissociation, concern for dieting, cognitive restraint, disinhibition of eating, suggestibility to hunger, and social desirability, were examined for accuracy of data entry. All scores were in the possible ranges, and displayed reasonable means and standard deviations (see table 4.1 for original means, standard deviations, and reliability statistics). Subsequently, all variables were assessed for estimated population skew and kurtosis with standardised values of  $z \pm 3.29$  ( $p < 0.001$ ) used to identify excessive skew, kurtosis, and outliers (based on Tabachnick & Fidell, 1996). Multivariate normality was assessed using Mahalanobis regression diagnostics adopting  $\chi^2$  (at  $\alpha = 0.01$ ; Tabachnick & Fidell, 1996) with 11 degrees of freedom for the following 11 variables: hypnotizability, the two dissociation measures (overall affective and cognitive dissociation scores), concern for dieting, cognitive restraint, and disinhibition of eating, susceptibility to hunger, social desirability, age, BMI, and weight.

BMI skew and kurtosis was within acceptable levels (skew  $z = 2.34$ , kurtosis  $z = 1.22$ ). The only variables with significant skew and kurtosis were the DES II (skew  $z = 7.79$ , kurtosis  $z = 13.67$ ) and the PAS II (skew  $z = 6.33$ , kurtosis  $z = 11.36$ ), which corresponds to previous findings using dissociation scales in non-clinical populations (e.g. Carlson & Putnam, 1993). One case was identified as an extreme outlier on both these variables (DES II,  $z = 5.08$ , PAS  $z = 4.9$ ), no other outliers were found. Logarithmic transformations of the dissociation variables substantially improved skew and kurtosis for both DES II and PAS, but did not remove the outlying values, so the outlying case was deleted from further analysis. Subsequent analysis of the untransformed DES II and PAS scores revealed that removal of the outlying case improved PAS skew and kurtosis to within acceptable levels (skew  $z = 2.27$ , kurtosis  $z = 0.98$ ), but DES II scores remained significantly skewed ( $z = 3.89$ ). Square-root transformation of the DES II scores improved skew to acceptable levels ( $z = 1.03$ ) and retained good kurtosis ( $z = -0.20$ ). The square-root transformation of the DES II was



adopted in subsequent analyses. Distribution characteristics were examined again for all variables to assess the potential impact of case removals. All variables retained good skew and kurtosis, with no univariate outliers. Examination of Mahalanobis distances found no multivariate outliers, which is relevant for supporting the use of regression and related multivariate analyses.

#### Treatment of Missing values.

Prior to transformation of DES II scores a missing data point for item 18 of the DES II was replaced by the closest acceptable DES value to the serial mean for item 18, first insuring that the distribution for item 18 did not contain outliers or excessive skew and kurtosis. Missing data for the BMI (5 cases) and SDS (4) cases merited replacement with serial means as both were near to 5% missing data and as important variables for the following analysis did not merit overall deletion. The HGSHS:A presented with only 57 cases, indicating a potentially large non-random attrition effect. Preliminary treatment of HGSHS:A missing values consisted of group coding of the missing and non-missing values an examination of group differences on the remaining study variables as suggested by Cohen and Cohen (1983). Unrelated t-tests ( $\alpha$  set at 0.05) indicated no statistically significant differences between HGSHS:A missing and non-missing data groups for age, BMI, dissociation, dietary restraint measures, disinhibition of eating, susceptibility to hunger, or current dieting. In order to preserve power, whilst not affecting correlational and regression statistics, serial mean substitution of HGSHS:A scores was adopted. The final sample N for all variables was 87.

#### 4.3.2. Overall means and reliabilities.

The means and standard deviations of the measures used in this study are illustrated in table 4.1 below. Cronbach's  $\alpha$  was conducted on the available items for each scale to examine internal reliability.

**Table 4.1.**  
**Means and internal reliabilities of measures for study 2.**

Variables (Measures)	Means (SD)	Cronbach's $\alpha$	Transformations required
Concern for dieting (RRS)	8.25 (3.68)	.81	None
Cognitive Restraint (TFEQ)	9.31 (5.60)	.89	None
Disinhibition of eating (TFEQ)	8.16 (3.53)	.77	None
Susceptibility to hunger (TFEQ)	5.88 (2.64)	.64	None
Cognitive Dissociation (DES II)	19.24 (10.74)	.89	Square-root
Affective Dissociation (PAS)	47.73 (8.56)	.86	None
Hypnotizability (HGSHS:A)	7.25 (2.76)	.73	None
Social Desirability (SDS)	12.83 (4.70)	*	None

\* reliability data not available for this measure.

A striking finding from the above table (4.1.) is the very high mean, for a non-clinical sample, of the DES. Previous studies have tended to find DES means in the much lower range. The possibility existed that these means have been coded incorrectly, or that particular scores may have accidentally been coded as too high. However, re-examination of the coding scheme and re-calculation of the mean did not reveal this to be an issue.

#### 4.3.3 Participant and dietary demographics.

The final sample had a mean age of 21.27 (SD 2.82), minimum age was 18 whilst maximum age was 27. Mean BMI was 21.62 (SD 2.19) ranging between 28.04 and 16.76. A significant minority of the sample were currently dieting (13.79%, 12/87;  $\chi^2$  (1) 46.54,  $p < 0.001$ ), but a significant majority had dieted at one time (75.86%, 66/87;  $\chi^2$  (1) 75.57,  $p < 0.001$ ). The average age of first ever diet was 13.05 (SD 5.96), whilst those currently on a diet had been dieting for an average of 5.5 weeks (SD 23.73) with large a dispersion of dieting durations.

In terms of desired body size, a significant proportion of the sample desired to be slimmer than not (83.9%, 73/87;  $\chi^2$  (1) 40.01,  $p < 0.001$ ). This finding was closely mirrored by a significant majority who did not want to be larger compared to those that

did (95.4%, 83/87;  $\chi^2 (1) = 71.74, p < 0.001$ ). General perceived preference for cultural attractive body size indicated that the significant majority of responses were in terms of slim body size (77%, 67/87) whilst a few responses were in terms of medium body size (21.84%, 19/87) and large body size (1.1%, 1/87). The overall  $\chi^2$  for the cultural attractiveness question indicating a significant difference ( $\chi^2 (2) = 80.26, p < 0.001$ ). Only the proportion of individuals indicating a slim ideal was above chance. Overall, there was support for preference to be slimmer and a preference for perceiving culturally attractive body size as slim. However, despite a widespread desire to be slimmer, few individuals actually considered themselves to currently be on a diet to lose weight, whilst a significant majority had embarked on such a diet in the past.

#### 4.3.4. Correlational analyses.

Pearson's product moment correlations were used in order to examine the degree of relationship between the questionnaire measures in this sample. As BMI, age, and weight may potentially affect some of the interrelationships between the variables under investigation (e.g. Slade, 1982), an initial set of correlations were run between these variables and the other variables in the study. As weight had missing data, but showed no significant skew and kurtosis, and contained no outliers, replacement using serial mean was conducted before it was used in this correlational analysis. Overall, neither age nor weight correlated with hypnotizability, dissociation, restraint, current dieting, disinhibition of eating, susceptibility to hunger, or social desirability (significance for all correlations set at  $p < 0.05$ ). However, BMI correlated weakly with disinhibition of eating ( $r = .25, p < 0.05$ ), but with no other variables, and is hence a potential covariate for this variable.

##### 4.3.4.1. General correlations with hypnotizability and dissociation.

Inter-correlations between overall hypnotizability, dissociation, and the restraint and dieting measures are illustrated below in table 4.2. Bonferroni corrections were applied to the correlations based on the main measures used, i.e. hypnotic suggestibility, cognitive and affective dissociation leading to a corrected  $\alpha$  for significance of 0.0062 for each of the above variables. This table assessed the possible relationships expected, in terms of the Socio-Hypnotic approach, between hypnotic suggestibility, the dietary restraint measures and social desirability. The second set of relationships examined the

potential associations between different types of dissociative experiences and factors relating to disinhibited eating, including dietary restraint.

**Table 4.2.**  
**Correlations matrix using hypnotizability and dissociation.**

<i>r</i> (n = 87)	Hypnotizability (HGSHS:A)	Cognitive dissociation (DES II -√)	Affective Dissociation (PAS)
Concern for dieting (RRS)	-.05	.16	.30
Cognitive restraint (EQ)	.09	.008	.19
Disinhibition of eating (EQ)	-.03	.12	.37** (.45**)
Susceptibility to hunger (EQ)	.04	.25	.23
Currently dieting?	.06	-.06	.05
Wish to be slimmer?	.03	.09	.15
Wish to be larger?	.13	.04	.01
Social desirability	.29**	-.12	-.37**

\* $p < 0.01$ , \*\* $p < 0.001$ . All correlations are 2-tailed.

Bonferroni corrected alpha = 0.0062.

Transformations: √ = square-root.

Correlations in brackets represent dis-attenuation of significant correlations where scale reliabilities are available.

Hypnotizability only correlated with social desirability, the expected correlations with restraint were not obtained. The overall DES II dissociation scores did not correlate with any measures. Partialling out BMI did not improve correlations involving the DES II.

Moderate correlations were found between the PAS dissociation scores and the disinhibition of eating scores, with a moderate to strong negative correlation with the social desirability scale. However, as the disinhibition of eating scores are also negatively correlated with social desirability ( $r = -0.41$ ,  $p < 0.001$ , 2-tailed) a partial correlation was conducted between the PAS and disinhibited eating with SDS scores held constant, resulting in a slightly weaker, and non-significant correlation ( $r = .26$ ,  $p = 0.013$ , 2-tailed). However, further partialling of BMI from the correlation between PAS and disinhibited eating improved the correlation to significance ( $r = .29$ ,  $p = 0.006$ ). The potential effect of other variables was further analysed later in this section using standard multiple regression procedures. Again correlations based on variables without missing data substitution did not significantly alter the above findings. Dis-attenuation again improved the magnitude of significant correlations.

Correlational analyses were conducted to examine the extent to which hypnotizability was related to dissociation type experiences. An examination of the inter-correlations between the hypnotizability, and dissociation measures revealed only a significant moderate to strong correlation between the dissociation scales (Table 4.3.).

**Table 4.3.**  
**Inter-correlations between hypnotizability an dissociation.**

<i>r</i> (n = 87)	Affective Dissociation (PAS)	DES II-√
Hypnotizability (HGSHS:A)	.01	.18
Cognitive Dissociation (DES II-√)	.58** (.66**)	-

**\*\*p < 0.001. Transformations: √ = square-root.**

**Bonferroni alpha set at 0.016**

**Correlations in brackets represent dis-attenuated values.**

#### 4.3.4.2. Sub-scale analysis of the dissociation scales, and taxonomic associations: Examination of correlations with dietary restraint and disinhibition measures.

As the DES II and PAS can be subdivided into sub-scales measuring different aspects of dissociation, the correlations between dietary restraint, disinhibition of eating, and susceptibility to hunger were analysed in relation to these sub-scales. This addresses the possibility that sub-types of dissociation may be related to features of disinhibitory eating. Examining the DES II first, it was found that the absorption sub-scale was the only factor with adequate skew ( $z = 2.07$ ) and kurtosis ( $z = -0.68$ ), whilst the others indicated substantial positive skew, excessive kurtosis (De-realisation/de-personalisation, skew = 10.78, kurtosis = 19.61; Amnesia, skew = 9.97, kurtosis = 15.04) and general lack of symmetry. In terms of the taxonomic sub-scales the non-pathological imagination/absorption sub-scale showed no significant skew ( $z = 2.66$ ) or kurtosis ( $z = 0.4$ ), whilst the pathological taxon sub-scale demonstrated substantial skew ( $z = 8.27$ ) and kurtosis ( $z = 11.62$ ).

Investigation of DES II de-realisation/de-personalisation sub-scale identified a number of potential outliers. Square-root transformation of the de-realisation/de-personalisation sub-scale improved skew ( $z = 2.32$ ) and kurtosis ( $z = 1.84$ ) to within acceptable ranges, and reduced the impact of the outlier to near acceptable limits ( $z = 3.32$ ) avoiding the need to exclude the outlying case. The DES II amnesia scale also

contained a number of outliers, but a natural logarithmic transformation improved skew ( $z = 0.42$ ) and kurtosis ( $z = -3.13$ ) whilst removing the impact such outliers. However, it is important to note that given the extreme initial 'J' shaped skew of both the de-realisation/de-personalisation and amnesia sub-scales, it is not wise to rely on correlations between these measures and variables of interest, especially as even after transformation the distributions hold very poor symmetry. In terms of the DES II taxonomic pathological sub-scale, a square-root transformation improved skew ( $z = 1.74$ ) and kurtosis ( $z = 1.4$ ) and lessened the presence of outliers to within accepted limits providing a more symmetrical distribution.

Examination of the Modification of affect, Modification of Control, and Modification of Cognition sub-scales of the PAS revealed good distribution characteristics throughout except for a slight skew for the modification of control scale which none-the-less remained within the range used in this thesis (Affect: Skew  $z = 0.90$ , kurtosis  $z = -0.88$ ; Control, skew  $z = 3.16$ , kurtosis  $z = 1.03$ ; Cognition, skew  $z = 1.65$ , kurtosis  $z = 0.77$ ). Correlations based on these sub-scales are illustrated below in tables 4.5 and 4.6. Means and internal reliabilities for DES and PAS untransformed sub-scales are shown in table 4.4.

**Table 4.4.**  
**Means and internal reliabilities for the dissociation measures sub-scales.**

	Means (standard deviation)	Cronbach's $\alpha$	Transformations required
Absorption and imagination (DES II)	28.90 (16.07)	.84	None
De-realisation and de-personalisation (DES II)	9.72 (11.82)	.82	Square-root
Amnesia (DES II)	6.62 (10.47)	.57	Logarithmic
Pathological Taxon (DES II)	11.42 (11.15)	.85	Square-root
Non-pathological absorption and imagination (DES II)	22.68 (11.56)	.74	None
Modification of Affect (PAS)	22.32 (4.33)	.76	None
Modification of control (PAS)	17.01 (3.81)	.73	None
Modification of cognition (PAS)	8.32 (1.59)	.47	None

Like the overall DES, the pathological taxon appeared rather higher than expected for a non-clinical population. However, the data were checked for the calculation of the sub-scales and no errors were found.

Correlations with the dietary restraint, disinhibition, and susceptibility to hunger measures, using the DES II sub-scales are illustrated in table 4.5. below. Unfortunately, none of the correlations reached significance when applying a Bonferroni correction for the overall table scale given that these correlations were explorative (overall Bonferroni corrected  $\alpha = 0.0016$ ). Due to the lack of significant correlations at more stringent alpha levels no attempt to apply dis-attenuation procedures was made.

**Table 4.5.**

**Correlations between DES II sub-scales and measures of dietary restraint and disinhibition**

	DES II factor sub-scales			DES II Taxons	
	Absorption and imagination	De-realisation and de-personalisation (sq)	Amnesia (log.)	Pathological Taxon(sq)	Non-pathological absorption and imagination
Currently dieting? ( $r_{pb}$ )	-.01	-.13	-.16	-.11	.01
Concern for dieting (RRS)	.20	.12	-.06	.16	.17
Cognitive restraint (TFEQ)	.01	.05	-.12	.10	.01
Disinhibition of eating (TFEQ)	.19	.16	-.05	.19	.13
Susceptibility to hunger (TFEQ)	.23*	.23*	.10	.20	.24*
Social desirability (SDS)	-.11	-.02	-.01	-.14	-.11

NB for this table \* $p < 0.05$ , 2-tailed.

Bonferroni  $\alpha = 0.0016$ .

Transformations: sq = square-root, log. = logarithmic.

The correlations based on PAS sub-scales (table 4.6 below) clearly indicate that modification of control and affect features of the PAS are correlated with measures of dietary restraint related with concern for dieting, disinhibition of eating, and susceptibility to hunger. The lack of correlation with cognitive restraint supports the possibility that dissociation as measured by the PAS is associated with features of chronic restraint concerns and disinhibition is related more to loss of control and affective features of dietary restraint. Bonferroni corrections were based on the overall correlations calculated for the PAS sub-scales ( $\alpha = 0.0016$ ).

**Table 4.6.****Correlations between PAS sub-scales and measures of dietary restraint and disinhibition.**

	PAS factor sub-scales		
	Modification of affect	Modification of control	Modification of cognition
Currently dieting?	.03	.09	.04
Concern for dieting (RRS)	.30** (.38**)	.35** (.45**)	-.09
Cognitive restraint (EQ)	.17	.23	-.09
Disinhibition of eating (EQ)	.34** (.44**)	.39** (.52**)	.08
Susceptibility to hunger (EQ)	.16	.28** (.40**)	.03
Social desirability	-.30**	-.38**	-.17

\*\* $p < 0.001$ , 2-tailed.

Bonferroni alpha = 0.0016

Correlations in brackets represent dis-attenuated correlations.

The negative correlations between the PAS affect and control subscales with SDS and BMI must be taken into account. Paritalling out social desirability did have an impact on the magnitude and of correlations between the modification of affect and the disinhibition of eating ( $r = 0.23$ ,  $p = 0.03$ ) and concern for dieting ( $r = 0.28$ ,  $p = 0.007$ ), and the modification of control and the disinhibition of eating ( $r = 0.24$ ,  $p = 0.028$ ), preventing these from becoming significant, but a significant correlation remained between these modification of control factor and concern for dieting ( $r = 0.34$ ,  $p = 0.001$ ). The additional partialling of BMI had little effect on the correlations, however, it did elevate the correlation between modification of control and cognitive restraint to near significant levels ( $r = 0.27$ ,  $p = 0.011$ , 2-tailed). In all, the most robust correlation was between the modification of control and the concern for dieting sub-scales.

#### 4.3.4. Regression Analysis.

Regressions analyses were carried out to examine the independent effects of hypnotizability, social desirability, and dissociation, on the different types of dietary restraint and dietary disinhibition measures. Of interest were the independent effects of hypnotizability on both concerns for dieting and cognitive restraint, especially when controlling for social desirability and dissociation factors that may be related to Socio-Hypnotic components of hypnotic suggestibility. The second set of regressions examined the potential independent influences of the different types of dissociation on



the disinhibition of eating and susceptibility to hunger, and examined the Dissociative Escape hypothesis of disinhibited eating as predicted by the potential defensive role of dissociation in relation to disinhibited eating (Heatherton & Baumeister, 1991; McManus, 1995).

Standard regression analysis was conducted in order to further examine the relationships detailed in the above correlational analysis, and examine if variables such as hypnotizability and dissociation have a unique contribution to dietary restraint and disinhibition, respectively. Standard multiple regression, where all predictors are entered into the regression equation simultaneously, has the effect of examining the potential independent contribution of each variable after all the variance from other variables has been accounted for.

Preliminary regression analysis were conducted using concern for dieting, cognitive restraint, disinhibition of eating, susceptibility to hunger, hypnotizability (with missing data replaced), social desirability, DES total scores (cognitive-control dissociation square-root transformation), PAS total scores (affective control dissociation), age, weight, and BMI in relation to separate regressions on each of the dietary restraint and the disinhibition measures. In order to reduce the number of variables used in the regression equations, a procedure suggested by a number of researchers when faced with low case-to-variable ratios (e.g. Tabachnik & Fidell, 1996), only the overall DES II and PAS scores were used rather than sub-scale scores. It should be noted that these are exploratory results and the sample size needs to be larger in order to draw more solid conclusions from these procedures, especially given the fairly low case-to-variable ratio (8.7 cases per variable when excluding the dependent variable, based on 87 participants for all regressions).

#### Regression Models of Dietary Restraint Variables

Using concern for dieting as the criterion or dependent variable gave a significant negative standardised regression coefficient ( $\beta$ ) for hypnotizability ( $\beta = -0.16$ ,  $t = -2.29$ ,  $p = 0.024$ ), with a semi-partial correlation of  $r_{sp} = -0.14$  (1.9% unique predictive variance in concern for dieting). This negative coefficient potentially indicates that higher hypnotizability to a very small extent predicts lower concern for dieting. The only other significant regression coefficients were given by cognitive

restraint ( $\beta = 0.69$ ,  $t = 9.52$ ,  $p < 0.001$ ) and disinhibition of eating ( $\beta = 0.30$ ,  $t = 3.94$ ,  $p < 0.001$ ), with hunger susceptibility close to significance ( $\beta = .13$ ,  $t = 1.9$ ,  $p = 0.059$ ). In order to further explore different interpretations of this data the above regression was repeated without including cognitive restraint as a predictor, i.e. preventing any variance due to cognitive restraint being removed from the concern for dieting variable. Regressing concern for dieting after removal of cognitive restraint led to a non-significant hypnotizability coefficient ( $\beta = -.11$ ,  $t = -1.09$ ,  $p = 0.27$ ), whilst retaining a significant coefficient for disinhibition ( $\beta = .46$ ,  $t = 4.07$ ,  $p < 0.001$ ) and also introducing a weak negative beta coefficient with age ( $\beta = -0.21$ ,  $t = -2.31$ ,  $p = 0.023$ ). The predictive relationship of hypnotizability on concern for dieting therefore only appears to hold when variance due to cognitive restraint is removed from the concern for dieting, but even then a very low semi-partial correlation was obtained.

A separate regression analysis was performed on cognitive restraint as a dependent variable, which led again to a significant positive regression coefficient with hypnotizability ( $\beta = 0.16$ ,  $t = 2.11$ ,  $p = 0.038$ ) accounting for a small, but unique variance in cognitive restraint of 1.9% (semi-partial  $r = .14$ ), after controlling for all the other variables. The only other significant predictors were concern for dieting ( $\beta = 0.78$ ,  $t = 9.52$ ,  $p < 0.001$ ), and a significant negative coefficient with susceptibility to hunger ( $\beta = -0.22$ ,  $t = -3.08$ ,  $p < 0.01$ ). As with the previous regressions it was advisable to examine the different interpretations of the predictability of the independent variables by varying the variables included in the equation. Non-inclusion of the concern for dieting predictor led to a lack of significant prediction with hypnotizability ( $\beta = 0.07$ ,  $t = 0.64$ ,  $p > 0.1$ ), but significant regression coefficients with social desirability ( $\beta = 0.26$ ,  $t = 2.20$ ,  $p = 0.030$ ), the PAS ( $\beta = 0.33$ ,  $t = 2.39$ ,  $p = 0.019$ ) with a semi-partial  $r$  of 0.23 (unique variance of 5.2%), a significant negative effect of age ( $\beta = -0.27$ ,  $t = -2.71$ ,  $p < 0.01$ ), and susceptibility to hunger ( $\beta = -0.25$ ,  $t = 2.41$ ,  $p = 0.018$ ). It appears that the contribution of hypnotizability to predicting level of restraint is heavily dependent on the variables chosen for inclusion, although affective dissociation does appear to have a level of unique predictive variance in cognitive restraint when variance due to concern for dieting is accounted for.

## Regression Models of Disinhibition of Eating Variables

Separate standard regression procedures were subsequently conducted on the disinhibition of eating and susceptibility to hunger variables as dependent variables specifically to assess the predictive contribution of dissociation and the other variables. When disinhibition was the dependent variable the DES II and PAS came close to significant regression coefficients, (DES II,  $\beta = -0.18$ ,  $t = -1.71$ ,  $p = 0.09$ ; PAS  $\beta = .22$ ,  $t = 1.82$ ,  $p = 0.072$ ), but the major predictors were concern for dieting ( $\beta = 0.55$ ,  $t = 3.94$ ,  $p < 0.001$ ) and social desirability ( $\beta = -0.32$ ,  $t = -3.27$ ,  $p < 0.02$ ). The same procedure conducted with susceptibility to hunger as the dependent variable produced only one significant predictor, a negative coefficient for cognitive restraint ( $\beta = -0.50$ ,  $t = -3.08$ ,  $p = 0.003$ ), with no significant coefficients for the DES II ( $\beta = 0.10$ ,  $t = 0.80$ ,  $p > 0.05$ ) or the PAS ( $\beta = 0.10$ ,  $t = 0.71$ ,  $p > 0.05$ ).

The above regressions were conducted again without the inclusion of the two restraint variables (concern for dieting and cognitive restraint). For the disinhibition of eating regression model, the affective dissociation predictor was significant (PAS:  $\beta = 0.33$ ,  $t = 2.67$ ,  $p = 0.009$ ; semi-partial  $r = 0.25$ , percentage unique variance = 6.2%), as was social desirability ( $\beta = -0.28$ ,  $t = 2.60$ ,  $p = 0.011$ ), and body mass index (BMI:  $\beta = 0.27$ ,  $t = 2.20$ ,  $p = 0.03$ ). However, cognitive dissociation was not a significant predictor (DES II:  $\beta = -0.18$ ,  $t = -1.52$ ,  $p > 0.1$ ). Regressing susceptibility to hunger, using all variables except the restraint variables, produced no significant predictors.

In order to examine the specific effects of the different types of restraint on the capacity of the dissociation variables and other variables to predict disinhibition and susceptibility to hunger, further regression analyses were conducted separately including only one of the two restraint measures at a time. No predictive effect of either type of dissociation was found when concern for dieting was included as a predictor (PAS:  $\beta = .19$ ,  $t = 1.58$ ,  $p > 0.05$ ; DES II:  $\beta = -0.15$ ,  $t = -1.44$ ,  $p > 0.05$ ). However, concern for dieting was a significant predictor for disinhibition ( $\beta = 0.38$ ,  $t = 4.07$ ,  $p < 0.001$ ) as suggested by previous regressions, as was social desirability ( $\beta = -.34$ ,  $t = -3.45$ ,  $p = 0.001$ ) with a negative coefficient. However, when using cognitive restraint in the equation, instead of concern for dieting, the affective dissociation coefficient became almost significant in terms of standard alpha values ( $\beta = 0.26$ ,  $t = 1.98$ ,  $p =$

0.051), with social desirability again acting as a potential negative predictor ( $\beta = -0.31$ ,  $t = -2.94$ ,  $p < 0.01$ ). The only other significant predictor was susceptibility to hunger ( $\beta = 0.22$ ,  $t = 2.27$ ,  $p < 0.05$ ). In terms of regressing susceptibility to hunger the only significant predictors to emerge when cognitive restraint was included in the equation were disinhibition of eating ( $\beta = 0.21$ ,  $t = 2.31$ ,  $p < 0.05$ ) and cognitive restraint as a negative predictor ( $\beta = -0.13$ ,  $t = -2.43$ ,  $p < 0.05$ ).

#### 4.3.5. Path Analysis of a simple model of restraint-disinhibition.

Path analysis is an analytical multivariate technique, based on multiple regression, that can help elaborate patterns of predictive relationships between variables (Cohen & Cohen, 1983; Schumaker & Lomax, 1996). The principal strength of path analysis is the use of diagrams to illustrate potential pathways of prediction between variables, which can then be tested using multiple regression, with each variable in turn acting as a dependent and using any incoming paths as indicators of possible predictors. Significant pathways are determined in terms of the traditional  $t$  statistics on the standardised  $\beta$ s. An explorative path procedure seemed appropriate for examining potential relationships between types of restraint and dissociation, in relation to disinhibition. A basic path network is illustrated in figure 4.1, where disinhibition of

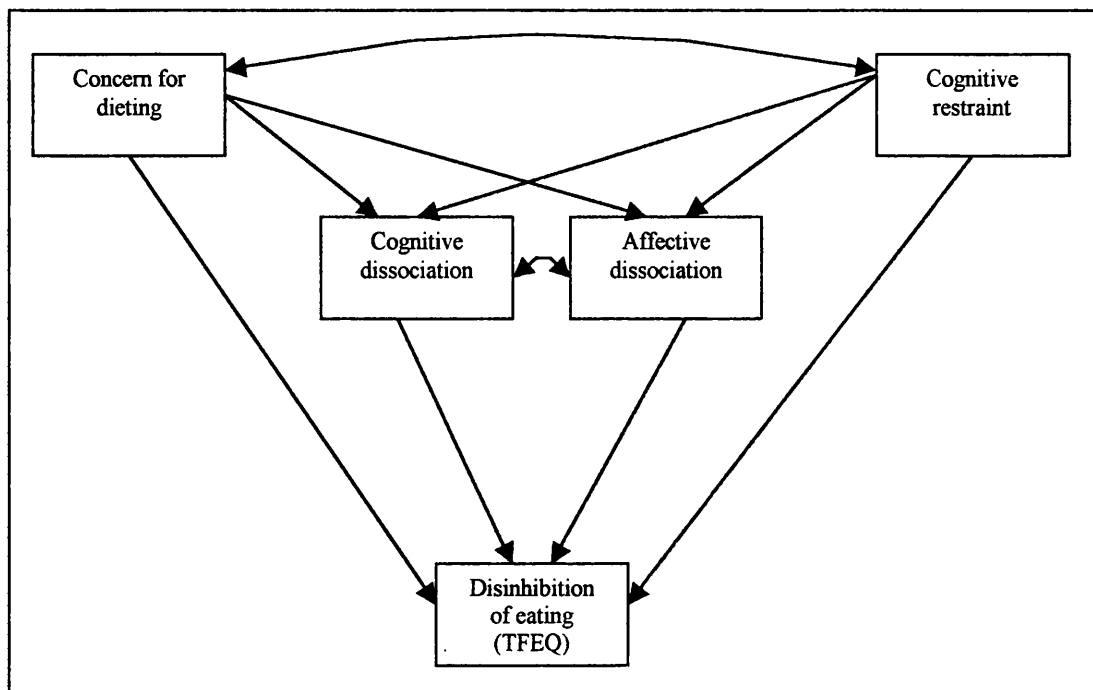


Figure 4.1. Basic Explorative Path model of predictive routes for disinhibited eating.

eating has potential predictive pathways feeding in different types of restraint and disinhibition. This analysis is designed to examine the potential role of dissociation in relation to the disinhibition of eating, taking into account the possible precipitating role of dietary restraint as suggested by Stice (1994), and various studies reviewed in section 2.2 of this thesis.

The strength of any one predictive pathway is indicated using standardised regression coefficients ( $\beta$ ) based on the particular regression equation used to determine those significant pathways feeding into the dependent variable of interest. Inter-correlations between usually correlated variables are represented using standard correlation coefficients and are indicated in the path diagram as curved arrows. Figure 4.2. indicates the significant pathways found. From the basic path model displayed in figure 4.2., it is clear that in addition to direct relationships, also known as direct pathways, between concern for dieting and disinhibition, and a potential negative suppression effect of cognitive restraint up disinhibition of eating, there are two indirect pathways from concern for dieting to disinhibited eating. One indirect pathway is represented via a route from concern for dieting to affective dissociation, and finally to disinhibited eating. The other is represented via a link between concern for dieting to cognitive dissociation, then via the correlation with affective dissociation, and then to disinhibited eating. Although figure 4.2 suggests that affective dissociation, and possibly cognitive dissociation, in part mediate a relationship between concern for dieting and disinhibition of eating, those mediating paths are rather weak compared to the direct link between concern for dieting and disinhibition of eating.

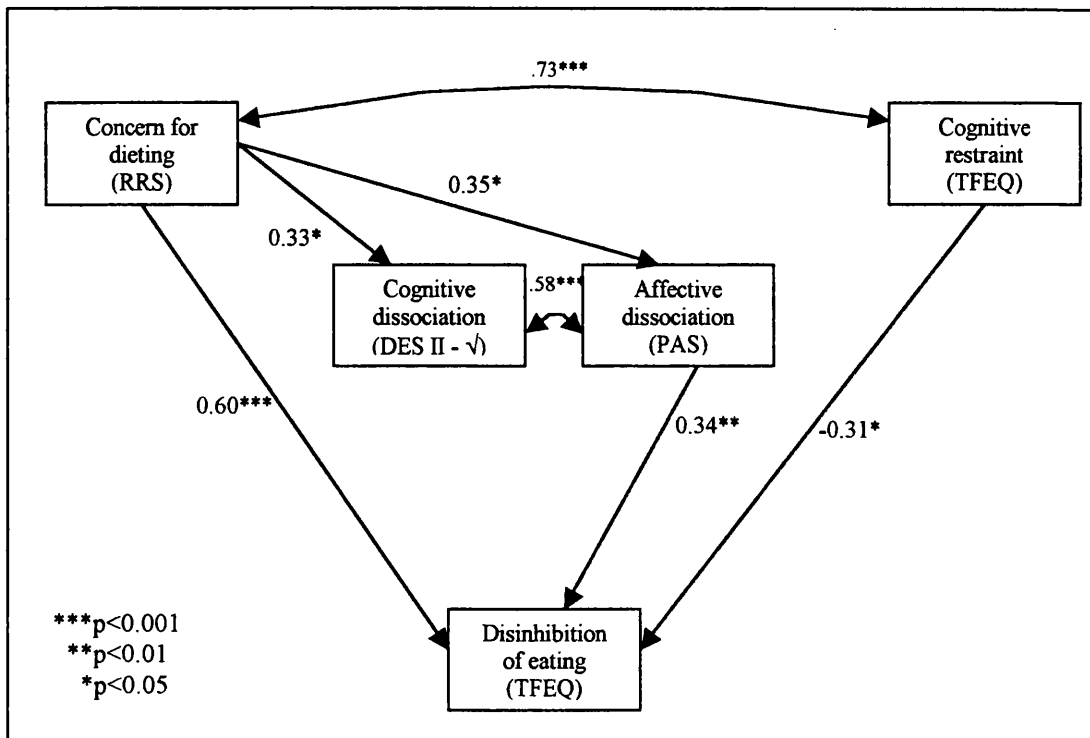
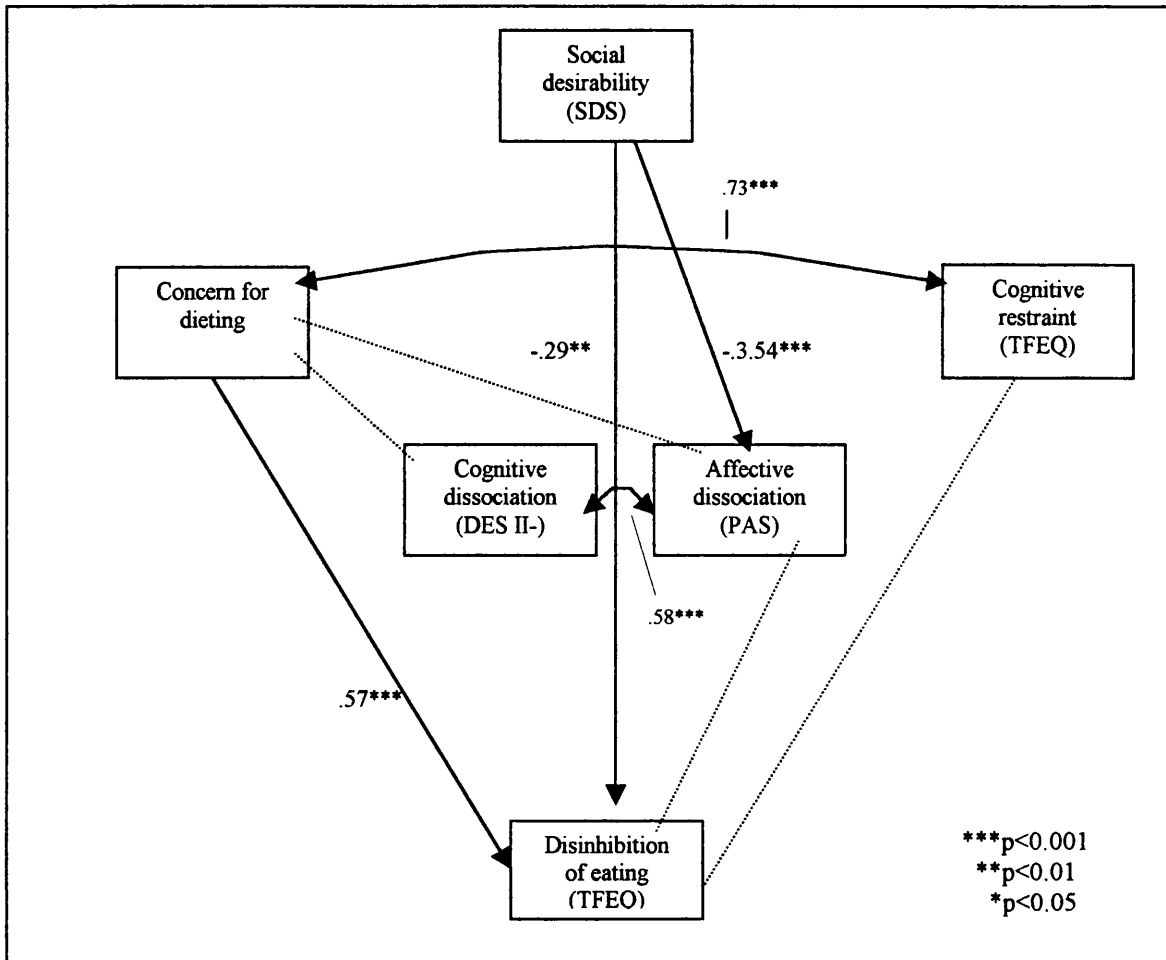


Figure 4.2. Basic path model showing the significant pathways to disinhibited eating. Numbers on lines indicate standardised regression coefficients ( $\beta$ ). Curved arrows indicate correlated variables with correlation coefficients ( $r$ ).

It is, however, important to note that these path diagrams can be as sensitive to the variables used as the standard regression procedures they are based upon, and that these basic diagrams provide an initial foundation for more complex structures. For example, inclusion of social desirability as a measure relevant to all variables in figure 4.2, i.e. is included in every regression involved in determining path significances and  $\beta$ , makes the pathways between both dissociation measures and disinhibition non-significant as can be seen in figure 4.3.



Note: dashed lines indicate previous significant paths.  
 Cognitive restraint has no significant paths linked in to it.

Figure 4.3. Path Diagram with social desirability used as a covariate in calculation of paths.

Although, PAS affective dissociation came close to retaining a significant path to disinhibition if adopting a liberal alpha ( $\beta = .20, t = 1.71, p = .090$ ). Social desirability may well be having a strong negative effect on disinhibition and affective dissociation scores, a feature indicated by correlations in table 4.3 above. Concern for dieting was close to a significant prediction affect on both cognitive and affective dissociation (DES:  $\beta = 0.31, t = 1.96, p = 0.053$ ; PAS:  $\beta = 0.28, t = 1.95, p = 0.054$ ).

It should be mentioned here that this path analysis was explorative, and no goodness-of-fit indices were used to assess the fit to the data and residuals were not calculated for each regression.

#### **4.4. Discussion of study 2.**

There was no support for the predicted correlation between hypnotic suggestibility and features of dietary restraint as hypothesised by the Socio-Hypnotic influence of suggestibility on dietary restraint. These findings stand in contrast with those of study 1 in which waking suggestibility was significantly correlated with chronic restraint only. From the pattern across the two studies, an implication arises that the components of waking suggestibility and hypnotic suggestibility differ, at least in terms of relationships with dieting restraint, contrary to the Socio-Hypnotic approach to dietary restraint. However, hypnotic suggestibility was moderately correlated with social desirability, a measure hypothetically related to a social compliance component of waking suggestibility. Also, some very minor predictive affects were found for hypnotic suggestibility and both the positive regulation of restraint and the decrease in the levels of chronic restraint concerns when controlling for the other restraint variable and controlling for other variables such as social desirability, dissociation, disinhibition of eating, susceptibility to hunger, age, weight, and BMI. These small affects of hypnotizability provide minor support for a Socio-Hypnotic view of suggestibility, especially as they control for dissociative capacity. However, as these findings also controlled for potential compliance related social desirability affects indicating some other components of hypnotic suggestibility are relevant here.

The hypothesis that dissociation may moderate the disinhibition of eating, based of Heatherton & Baumeister (1991) and McManus (1995) defence models of dissociation, was supported but only in terms of overall affective related dissociation and specifically in terms of modification of control experiences. Regression models added further support for the relationship between affective dissociation and disinhibition of eating, but only when the dietary restraint measures were not included in the equations. Path models identified that affective dissociation may mediate the relationship between chronic concerns for dieting and disinhibition. However, social desirability was identified as a possible confound in this relationship in terms of its



association with the measurement of dissociation and disinhibition of eating. These results and those related to hypnotic suggestibility are examined in more detail below.

This study primarily set out to explore previously unexamined relationships between levels of hypnotic responsiveness; and potentially problematic features of eating behaviours and concerns based upon types of dietary restraint; dietary disinhibition and vulnerability to hunger. Initial correlational results clearly indicated that there was no direct relationship between hypnotizability and the different types of dietary restraint examined in this study, i.e. cognitive restraint and concern for dieting. There were also no relationships between hypnotizability and current dieting, although given the highly uneven splits of the currently dieting variable any such correlations would normally be treated with caution. Also, potential problematic eating attitudes and behaviours such as disinhibition of eating and a vulnerability to hunger did not correlate with hypnotizability, in contrast with previous findings (Groth-Marnat & Schumaker, 1990). Partialling out BMI, age, and weight did not change these results. Hypnotizability did, however, correlate moderately with social desirability suggesting that at least some aspect of hypnotic responding in this study is related to efforts to present a socially desirable image, supporting the presence of a compliance component in hypnotic suggestibility.

As suggested above, these correlational findings did not support the socio-hypnotic hypothesis that hypnotizability, given its putative role as an index of suggestibility, may indicate higher levels of internalisation of social pressures that increase the motivation underlying dietary restraint concerns and related patterns of problematic eating (Groth-Marnat & Schumaker, 1990; Frاسquilho & Oakley, 1997). A related hypothesis, that the cognitive control factors potentially underlying hypnotizability may also help maintain cognitive control over eating, was not supported due to the lack of association between cognitive restraint, a measure of successful dietary restraint, and hypnotizability.

Separate simple regression analyses of the two restraint measures based on hypnotizability, cognitive and affective dissociation, age, weight, BMI, social desirability, disinhibition of eating, and susceptibility to hunger, revealed findings beyond the original correlational data. Hypnotizability was found to have a weak, but unique, positive predictive affect on the cognitive restraint scores independent of other

significant prediction affects for concern for dieting (positive slope) and susceptibility to hunger (negative slope) on levels of cognitive restraint. However, this predictive affect of hypnotizability only occurred when variance based on concern for dieting was controlled for, in addition to the other variables used in the overall regression equation. One interpretation of this finding is that once variance due to chronic concern for dieting is removed, in addition to variance from disinhibition of eating and hunger susceptibility, elements of hypnotizability predict features of the 'purer' measure of cognitive restraint, features unrelated to *lack* of dietary restraint. Such features may be in part related to cognitive control mechanisms that potentially underlay hypnotizability and cognitive restraint (e.g. Crawford, Brown, & Moon, 1993; Crawford, 1994). However, given the relatively small sample size and the very small level of prediction in terms of hypnotizability, these effects may have been due to statistical artefacts related to small case-to-variable ratios.

Hypnotizability demonstrated a weak yet significant negative regression slope ( $\beta$ ) in relation to concern for dieting, indicating a potential minor negative effect of hypnotizability on concern for dieting, i.e. higher hypnotizability predicts lower levels of concern for dieting. However, this affect only occurred when cognitive restraint was included as a predictor. Again, when elements of successful cognitive-type restraint are removed from concern for dieting variance, hypnotizability or perhaps putative cognitive features potentially involved in hypnotic responding may prevent concern for dieting, perhaps by increasing attentional control over such concerns. Again, this interpretation of the results must be taken with caution given the small case to variable ratio.

A second central concern of this study was the examination of relationships between different types of dissociation, based on cognitive and affective loss of control experiences, and problematic eating factors related to disinhibition/loss of control over eating. There was a moderate correlation between the overall measure of cognitive dissociation (DES II) and the overall measure of affective dissociation (PAS) suggesting they may be in part related, but nonetheless tend to measure different features of dissociation. Neither measure of dissociation correlated with hypnotizability, suggesting that dissociation type processes are not part of hypnotic responding, contrary to dissociation theories of hypnosis, but in support of Socio-Hypnotic theories and the evidence from previous correlational studies (see section 2.1.7 and section 2.1.8.2).

In terms of cognitive related dissociation, the DES II was weakly, but not significantly related to susceptibility to hunger, contrary to findings by Frاسquilho and Oakley (1997). Again, unlike Frاسquilho & Oakley, no significant correlation was found between the DES II and disinhibition of eating. Further examination of these correlations, based on the DES II factor sub-scales and the pathological/non-pathological taxonomic sub-scales, revealed that susceptibility to hunger was weakly, but non-significantly related to de-realisation/de-personalisation experiences, and to the non-pathological absorption and imaginative type items of the DES. None of the DES II sub-scales or taxons correlated with disinhibition.

The lack of significant relationships between cognitive dissociation and disinhibition of eating does not appear consistent with clinical research that suggests dissociation is higher in bulimics, i.e. individuals with clinical levels of bingeing and purging behaviours. It may be that dissociation is related to other features of bulimic eating behaviour, not generally present in non-clinical samples, such as the use of purging strategies and self-induced vomiting or other types of purging used by some bulimic individuals (e.g. Abraham & Beaumont, 1982; Pettinati, et al. 1985), which may lead to dissociative type-experiences captured by scales such as the DES II. In addition to this, it should be noted that a capacity to dissociate, measured in part by spontaneous dissociative experiences, was hypothesised as a potential factor in defending against aversive self-awareness which may open individuals to subsequent disinhibited eating behaviour (e.g. McManus, 1995). This hypothesis was based on a re-interpretation of Heatherton and Baumeister's (1991) Escape Hypothesis. In light of the above escape-type models, it may be that more cognitive related dissociation lacks the overt affective components required to identify such a dissociative defence against negative affect, especially within non-clinical populations.

In terms of affective dissociation, the PAS did show significant moderate correlations with both disinhibition of eating and concern for dieting variables, which appeared to be based more on the modification of affect and modification of control sub-scales of the PAS. The modification of control sub-scale was also the only PAS sub-scale related to susceptibility to hunger. However, it is important to note that in this study social desirability was negatively correlated with the overall PAS, and also with its modification of affect and control sub-scales, indicating that these kinds of

dissociative experiences are not considered features of a socially desirable self-image. Partialling out social desirability from the above analyses produced weaker correlations in general, with the only significant correlation being between concern for dieting and modification of control. These findings in part support those of Rosen and Petty (1994) who also found overall PAS scores, and the affective and control sub-scales, moderately correlated with broad aspects of binge behaviour and with features related to body dissatisfaction, features interpretable within the escape hypothesis cited above. However, the confounding effect of social desirability was problematic and indicates that only chronic restraint concerns, which may be related to body dissatisfaction as suggested by Stice (1994), maintains a plausible relationship with affective dissociation.

Further regression analyses of the overall dissociation data did not produce significant regression coefficients for either cognitive or affective dissociation in relation to disinhibition of eating or susceptibility to hunger when controlling for hypnotizability, social desirability, restraint factors (concern for dieting and cognitive restraint), age, weight and BMI. However, when these regression equations did not include any restraint factors, affective dissociation demonstrated a minor unique contribution to disinhibition of eating, but no effects emerged when susceptibility to hunger was regressed. Examining the potential effects of controlling for variance associated with each separate restraint variable in relation to the disinhibition and hunger factors, revealed that including concern for dieting led to significant predictions for concern for dieting and social desirability in terms of disinhibition of eating only. This suggests that a significant amount of variance in disinhibited eating is interpreted by concern for dieting, with no unique variance predicted by dissociation in general. When only the cognitive restraint factor was included, dissociation again failed to significantly predict disinhibition. Similar results were found for the susceptibility to hunger variable. The regression analyses suggested that there is no unique variance in these dietary disinhibition type factors due to either cognitive or affective dissociation.

However, different findings emerged in terms of the relationships between types of dissociation and disinhibition of eating when a path analysis was used to examine possible inter-relationships between a smaller set of variables and their prediction of disinhibited eating. In the initial path model only cognitive restraint, concern for dieting, and the two types of dissociation were examined as predictors of disinhibition of eating. The overall path model is based on research reviewed in chapter 2, relating to the

apparent paradox that increased restraint leads to increased disinhibition, and that dissociation, or types of dissociation, may mediate such a relationship. The initial path model demonstrated such a mediating effect, if only a moderate one, between concern for dieting and affective dissociation, with a significant path leading from concern for dieting to affective dissociation, and finally to disinhibited eating. Another potential indirect pathway to disinhibited eating consisted of links between concern for dieting, cognitive dissociation, and affective dissociation. This explorative model suggested that some features of concern for dieting, potentially related to negative self-image, may predict higher levels of affective dissociative reactions, which in turn increases levels of disinhibited eating. Nonetheless, the strongest path was directly between concern for dieting and disinhibition of eating, so the alternative routes via dissociation do not support a strict mediating role for dissociation. A mediating role would be in part defined as a variable that comes between two variables, such that the mediator accounts for most of the variance between those two original variables (e.g. Baron & Kenny, 1986).

A key feature of the initial path model was its reliance on a smaller set of variables than the regressions conducted previously. Although this is a good means to begin developing path models, the subsequent inclusion of additional variables, such as social desirability, illustrated the need to be cautious in the choice of variables used for analysis. When variance from social desirability was included in the path model it suppressed variance in previously significant routes. The extent to which this effect represents a real psychological process or a methodological feature of questionnaire design is an issue for consideration. It may be that in describing the study to participants as involving problematic eating patterns may have accentuated the effect of socially desirable responding on measures related to such self-presentation issues, i.e. disinhibition of eating and concern for dieting. Such an effect may be illustrated in the significant suppression effect that social desirability had on disinhibition of eating and affective dissociation, especially as both variables had significant zero-order correlations with the social desirability scale. More advanced modelling techniques incorporating additional variables and tests of model-to-data fits may further elucidate relationships of interest.

Before concluding it is worth mentioning that as in study 1, this study sample exhibited clear desires to become slimmer and not to become larger, and with a majority

of individuals having dieted at some point in the past. A significant majority of individuals also indicated a slim body shape as an attractiveness ideal for their culture. However, whilst there appeared to be a widespread desire to achieve a thinner body shape in this sample, only a small minority of participants actually reported dieting to lose weight. The sample mean of cognitive restraint over eating tended to suggest low to average levels of restraint, but did not match the very low levels of reported dieting found in this sample. However, having pointed this out, the mean level of concern for dieting was closer to the higher means found in previous studies (e.g. Gorman and Allison, 1995). The lack of actual self-reported dieters in this study potentially suggests that, overall, the level of internalised dieting concerns did not reach levels sufficient to lead to actual dieting behaviours. The prevalence of moderately concerned non-dieters as a group in this study may have affected the subsequent associations between the eating variables and the key measures of interest in this study, i.e. hypnotizability and types of dissociation. Potential dieting based demographic differences between the sample used in this study and participants sampled by Groth-Marnat and Schumaker (1990) may have accounted for the failure to find significant zero order correlations between measures of dietary restraint and hypnotizability.

#### **4.5. DES II Means**

Finally, an important feature remains to be discussed in relation to the obtained means on the DES II. As noted earlier, the means appear very high for a non-clinical population, especially in comparison with the mean found in previous studies of eating disordered individuals examined in chapter 1 (see table 1.1). Although the DES is not strictly a diagnostic measure of clinical symptoms, the high levels of dissociation may be indicative of dissociative psychopathology.

Alternatively, there may a number of be reasons why the DES II means were elevated in this study. Previous studies have found that the mean score for the DES using non-clinical *adults* (cf. Carlson and Putnam, 1993) has ranged from 3.7 (n = 25) to 7.8 (n = 415). However, mean levels for late *adolescents* (cf. Carlson & Putnam, 1993) have ranged between 11.8 (n = 108) and 23.8 (n = 259). It is possible that age factors may affect the level of dissociative experience in the general population. This possibility is supported by norm data from Ross et al. (1990) who found mean levels of dissociative experiences in women aged 18-29 to be 15.6 (SD 12.1), while mean levels

for women aged 30-39 where lower at 10.3 (SD 8.9). The mean age of participants in the current study of 21.27 (SD 2.82) suggested a relatively young sample, with a minimum age of 18, and a maximum age of 27, potentially comparable to Ross et al. (1990) younger category.

The DES mean obtained in the current study of 19.24 (SD 10.74) is also much closer to the level found by Ross et al. (1991) and is below the level cited by Carlson & Putnam (1993) of 23.8 for an adolescent sample (Carlson et al, unpublished data). Therefore, an age factor may be at least partially responsible for the higher means found in this study. In a similar study to the present one, Rosen & Petty (1994) also found a DES mean (DES = 14.3, SD 10.4) closer to the one found in the present study, for a student sample with a mean age of 18.5 (SD 0.85), than the adult means cited by Carlson and Putnam (1993). Gender differences may be implicated when samples include males and females, but none-the-less Ross et al's (1991) study provides the best comparisons to the current study as the figure quoted above are for females.

Other studies have also found higher levels than expected on the DES. A mean of 21.8, (SD 12.8), mentioned in section 2.5.3 of this thesis, was found by Frischholz et al, (1992, n = 311) in a student sample with mean age of 20 (SD 3.5), again of similar age to participants in the current study and containing 62% females. Butler and Bryant (1997) found a relatively high mean of 18.57 (SD 12.17) in their mixed gender student sample of 39 females and 9 males, again with a sample mean age close to the present study (age = 20.18, SD 5.11). A common feature of these studies was that they examined dissociative experiences in contexts involving hypnotizability. There is, therefore, a possibility that administrating the DES in hypnotic context may increase the level of DES via a context effect. However, while context effects have been recognised in terms of absorption (e.g. Council & Kirsch, 1996), Butler and Bryant (1997) failed to find such effects in their study when using the DES II.

In light of the above findings, the DES mean found in this study is high, but not potentially abnormally high in relation to DES means found in a number of other studies. The alternative possibility is that the student samples quoted above, and the one examined in this study, have potentially uncovered tendencies for dissociative pathology, and hence are unrepresentative of the general population. This would be a serious issue if the high DES mean found in the present study were unique in

comparison to studies using apparently non-clinical samples. As it has been shown not to be unique, and potentially related to age factors, the seriousness of this alternative possibility is reduced. However, another possibility is that despite attempts to screen for previous or current eating disorders, a sub-group of participants in this study were actually eating disordered. Using a measure of level of eating pathology in future studies may help determine if this is a possibility. It should be noted that the pathological taxon of the DES II (mean = 11.42, SD 11.15) was slight elevated in this study compared to Waller & Ross (1997) 5.41 (SD 1.87). Although this elevated taxon mean may indicate a slightly higher incidence of actual or latent dissociative pathology, again an age interpretation may be relevant as Waller & Ross's findings were based on a mixed gender sub-sample of Ross et al.'s study (1991) that had a mean age of 44.4 (SD 17.5) for males and 41.6 (15.4) for females. Without the original data it is impossible to examine the mean levels for the dissociative taxon for females nearer to the age range used in the current study, or if age factors have an impact on the expression of the latent dissociative taxon.



## **Chapter 5**

### **Study 3: A partial replication of study 2 findings with an examination of body dissatisfaction, depression, different types of restraint and loss of control eating.**

#### **Chapter overview**

This chapter presents a study that examined a wider range of potential relationships between dietary restraint and dietary disinhibition measures in relation to hypnotizability and dissociation, including scales related to more pathological eating behaviours, body dissatisfaction, and weight fluctuation. The study also included a measure of depression, a factor that may play an important role in disinhibited eating for some individuals, and may also be a common confound of dissociation. This wider domain of measures formed the basis of a factor analysis that attempted to capture the dimensions underlying problematic eating behaviour, in order to examine these factors in relation to hypnotizability, cognitive dissociation, and affective dissociation.

#### **5.1. Introduction to study 3.**

In the previous study, the Socio-Hypnotic approach to hypnotic suggestibility in relation to problematic eating was not supported in relation to dietary restraint. However, in addition to concerns that the measure of hypnotic suggestibility used suffered from attrition factors, a possibility remains that sub-groupings of items within that measure may be better related to processes occurring in waking suggestibility contexts, and therefore in turn may be related to dietary restraint. Both issues merited further investigation on a larger sample of hypnotizability scores. Findings from Woody et al (1997), support the hypothesis that easier hypnotic items correlate with forms of non-hypnotic suggestions and therefore may be more indicative of some processes occurring in waking suggestibility. Hypnotic Spectrum Analysis is a technique that allows the examination of these hypotheses in relation to the different items inherent in

hypnotic suggestibility scales, and can explore if the easier suggestibility items do relate to dietary restraint and related features of disordered eating. There was also a need to explore the findings of study 2 involving affective dissociation and disinhibition of eating in terms of measures indicative of more pathological forms of disinhibited eating.

Furthermore, general factors underlying problematic eating associated with dietary restraint and dietary disinhibition measures used in study 1 and study 2 have not been examined in relation to more pathological eating disordered concerns and behaviours, such as drive for thinness, global body dissatisfaction, and bulimic tendencies. Again, it may be that different features of hypnotic suggestibility and different types of dissociation, as identified by different item content, may be related to the underlying factors supporting associations involving both pathological and non-pathological forms of eating attitudes and behaviours. Also, negative affective factors such as depression may play a role in the underlying pattern of correlations between measures of disordered eating as indicated by studies of dietary restraint outlined in section 2.2.3. and Stice (1994). These possible associations needed to be explored. Therefore, in addition to the more non-pathological measures of dietary restraint and disinhibition used, sub-scales of the Eating Disorder Inventory were administered to examine pathological dimensions related to disordered eating, such as those mentioned above.

### Background to Study 3.

So far in this thesis a limited range of restraint and disinhibition measures have been examined, namely cognitive restraint, concern for dieting, disinhibition of eating, and susceptibility to hunger. However, measures of other factors, including more pathological processes related to different types of dietary restraint and disinhibition of eating, such as fear of weight gain, drive for thinness, and bingeing, may be related to hypnotizability and/or dissociation. Research reviewed in chapter 1 clearly suggested that hypnotizability, and to some extent dissociation, are elevated in patients with clinical diagnoses of eating disorders, especially those with bulimic symptoms.

In addition to measures of hypnotizability, dissociation, and social desirability, the study in this chapter included variables related to dietary restraint, abnormal eating, and disinhibition of eating. Dietary restraint measures included fears of fat and weight gain and the restraint factors examined in study 2. Pathological or abnormal eating variables included body dissatisfaction, drive for thinness, and bulimic tendencies, all constituents of the Abnormal eating EDI (Eating Disorders Inventory) scale (Valdiserri & Kihlstrom, 1995b), in addition to depression as a related psycho-pathological measure. Disinhibition factors included the disinhibition of eating and susceptibility to hunger factors used in study 1 and 2, and a weight fluctuation factor. The dieting, abnormal eating, and disinhibition variables provide a reasonably broad set of measures in which to examine associations with hypnotizability and types of dissociation. However, there may also be underlying factors tying these variable together which may be made clearer using factor analytic techniques. In addition to providing potential insights into underlying commonalities, such techniques also provide a means of reducing the mass of variables into more manageable components that can then be used to investigate possible associations with hypnotizability and types of dissociation.

New variables indicative of problematic eating formulated by factor analytic techniques can be assessed for association with hypnotizability and dissociation. Such an approach may give insights into how potential factors underlying a range of problematic eating attitudes and concerns may be related to different aspects of hypnotic suggestibility and types of dissociative experience.

In terms of hypnotizability, study 2 (in chapter 4) examined less clinical patterns of dietary restraint and disinhibition of eating in order to uncover possible associations between such non-clinical factors and hypnotizability scores. The associations found were complex, but generally any affect of hypnotizability was weak and more related to non-disinhibition based features of restraint concerns and behaviours. However, non-clinical studies have not tended to examine whether hypnotizability is correlated with a range of more pathological, or abnormal, restraint and disinhibition related factors, including relentless drive for thinness, global body dissatisfaction, and bulimic tendencies. One study that has examined such pathology-orientated measures found that fears of fat or weight gain and overall levels of anorexic and bulimic symptoms were moderately related to hypnotizability in a non-clinical sample (Groth-Marnat &

Schumaker, 1990). These findings were originally interpreted as a potential influence of hypnotic suggestibility processes on the internalising of social pressures ‘to be thin’ (Groth-Marnat & Schumaker, 1990). Stice’s (1994) socio-cultural model of bulimia nervosa provides a framework in which social pressures to obtain a thin body are potential causes of body dissatisfaction, restraint, depression, and finally bulimic symptoms. Fat phobia, i.e. fears of fat and weight gain seems a plausible concomitant of a drive for a thin ideal, with both these factors in part leading to body dissatisfaction, and then in turn leading to restraint concerns and/or negative affect.

In addition to examining zero-order associations between total hypnotic suggestibility scores and factors related to problematic eating, it is important to mention that a major disadvantage of using total hypnotizability scores may be that they obscure potentially interesting individual correlations (e.g. Balthazard & Woody, 1992, Woody et al, 1997) between specific items on hypnotic responsiveness scales and factors of interest. Consequently, the study reported in this chapter also used an item analysis technique based on the Hypnotic Spectrum Analysis developed by Balthazard and Woody (1992: also called Spectral Analysis by its authors) to examine hypnotizability scores in relation to factors underlying patterns of eating attitudes and behaviours. Biserial correlations between the HGSHS:A items and underlying factors of interest allows the examination of trends indicative of different hypnotizability-item response profiles to particular eating related factors.

Previous studies have indicated that the easier items on hypnosis scales, such as direct ideomotor suggestions for bodily movements, and some of the easier challenge items, are more related to non-hypnotic suggestibility compared with harder cognitively orientated items (Woody, et al. 1997). Conversely, the harder items appear more related to absorption like processes potentially indicative of ‘true’ hypnotic responding that may involve more dissociative-type processes (Balthazard & Woody, 1992). It is hypothesised that the easier items on the hypnotizability scale used in this study may reflect features of waking suggestibility. The Socio-Hypnotic approach to dietary restraint referred to throughout this thesis has focused on the potential influence of waking type suggestibility factors on the internalisation of dieting concerns. If such a hypothesis is correct, as suggested by findings in chapter 1, and the results of Woody et al’s (1997) hypnotic spectrum are robust, then the easier hypnotic items may be

associated with dimensions of problematic eating based on features of restraint concerns. Furthermore, disinhibition of eating has been related to dissociative processes and mechanisms (e.g. McManus, 1994; Everill et al, 1995). If dissociative mechanisms were at work in both disinhibited eating and hypnotic responses to harder hypnosis items, then the harder hypnotic items should show some reasonable and significant degree of relationship with disinhibition type factors.

#### Pathological and non-pathological disinhibition of eating and dissociation.

In a similar manner in which a variety of restraint measures cover a broader area of the dietary restraint construct, including its more pathological features, the concept of dietary disinhibition can also be examined using more pathology-orientated measures. Throughout this thesis extreme tendencies to overeat or binge have been hypothesised as in part related to types and features of dissociation (e.g. Heatherton & Baumeister's, 1991; McManus, 1995; Everill, et al. 1995) especially in terms of defence mechanisms against aversive self-realizations and general anxiety or dysphoric mood. Study 2 provided some evidence of this based on zero-order correlations between disinhibition of eating and affective dissociation related to modification of affect and control of behaviour.

Valdiserri and Kihlstrom (1995a, 1995b) demonstrated, using a non-clinical sample, that a measure of cognitive type dissociation, the Dissociative Experiences Scale II (Carlson & Putnam, 1993), was generally related to features of more severe disordered eating behaviours and related personality traits. As previously mentioned, Rosen and Petty (1994), who also used a non-clinical sample, found similar patterns this time based on a measure of affective dissociation, with some correlations also present between cognitive dissociation and selected features of clinical related eating patterns. However, while zero-order correlations serve as good guides for potential relationships they do not account for other sources of variance that may make such correlations redundant. Valdiserri and Kihlstrom (1995b) found that such relationships appear redundant when other clinical factors such as depression are statistically controlled using multiple regression. As already stated in chapter 4 the use of regression techniques is desirable in order to further examine the relevance of dissociation to features of disinhibition, especially non-pathological forms of disinhibition not

examined by either Valdiserri and Kihlstrom (1995a, 1995b) or Rosen and Petty (1994). The potential moderating effects of dissociation on relationships between disinhibition of eating, dietary restraint, and body shape concerns, can also be examined using regression models. Significant moderating effects would indicate that features of higher dissociation might influence the increased presence of disinhibition in restrainers. From previous studies (e.g. Rosen & Petty, 1994; Study 2 in this thesis), affective dissociation may be the best candidate for such a moderating role.

## **5.2. Method.**

### Participants.

The overall sample consisted of 145 female first year psychology undergraduates from University College London participating in introductory lab classes as part of their first year course schedule. From this sample 20 participants in total were excluded from subsequent analysis as they had either been previously diagnosed with an eating disorder or medical dietary condition (9 excluded), were over 30 years of age (5 excluded), and or had a BMI of over 30 or under 16 (6 excluded). The final sample prior to analysis consisted of 125 participants, with a mean age of 19.68 (SD 2.56, ranging from 18 to 27), and a mean BMI of 20.68 (SD 2.29, ranging 16.21 to 27.64). The sample consisted of 125 participants prior to analysis.

### Materials and Apparatus.

*Harvard Group Scale of Hypnotic Susceptibility: Form A (HGSHS: A).* The HGSHS: A was again used as a measure of suggestibility. Participants either pass or fail a list of 12 suggestions, with total summed scores indicating level of hypnotizability. High scores indicate higher hypnotic responsiveness. Responses are recorded in a standard response booklet, after an audio-taped presentation of the suggestion. Taped presentation was used to standardise administration and a Sony 'Cassette-Corder' was used for audiotape play back. Details of the HGSHS:A psychometrics have been included elsewhere in this thesis (sections 2.5.2, and 4.2). Examples of HGSHS:A items are listed in section 2.5.2. of chapter 2.

*Three Factor Eating Questionnaire (TFEQ)*. As detailed in study 1 and 2, the TFEQ contains scales measuring cognitive restraint (conscious monitoring and restrictive control over eating), disinhibition of eating (loss of control over eating), and susceptibility to hunger. Each scale is scored by summing over separate items, with higher item scores indicating higher levels of the respective factor. Scale psychometrics have been detailed previously in sections 2.7 and 4.2..

*Revised Restraint Scale (RRS)*. The complete RRS was used in this study, incorporating both the concern for dieting and weight fluctuation sub-scales (Blanchard & Frost, 1983) which can be summed to give an overall restraint score indicative of chronic restraint punctuated by periods of unsuccessful dieting as measured primarily by the weight fluctuation scale. Higher scores on the total RRS suggest a dieting history with higher levels of unsuccessful chronic restraint, but also indicate higher levels of pre-occupation with food and eating. Though use of the overall RRS has been debated (e.g. Blanchard & Frost, 1983; Heatherton, et al. 1988; see also Gorman & Allison, 1995, for review) it is used here as both an overall scale and as a source of concern for dieting and weight fluctuation sub-scales. Means for the overall RRS have been reported at 13.4, SD 5.8 for American female college students (Klem et al, 1990), 13.5, SD 5.4 for British women (Wardle & Beales, 1986), and 15.1, SD 7.0 for another sample of American college females (Allison, et al, 1992). Whole scale internal reliabilities have been moderate to good in females (e.g. 0.86: Ruderman, 1983; 0.78, Laessle, et al, 1989; 0.78, Klem et al, 1990; 0.83, Allison et al., 1992).

*The Concern for dieting sub-scale* of the RRS used in this study differed from previous formats used in studies 1 and 2 of this thesis, reverting to the same variable 4- to 5-category response format used by Herman and Polivy (1980), rather than a non varying 4-category format used in studies 1 and 2. The return to the original Herman & Polivy (1980) scoring format was suggested in order to improve comparisons with the dietary restraint literature. Despite different response categories, lowest responses are always anchored at 0. Scores on the concerns with dieting sub-scale are summed over items with higher scores indicating greater levels of concern for dieting and the regulation of food intake. Means for the original concern for dieting sub-scale range from 7.8, (SD 3.0) (Wardle & Beales, 1986) to 9.3 (SD 4.0) with internal reliabilities

ranging from 0.66 to 0.71 indicating moderate internal consistency based on Cronbach's  $\alpha$  (Gorman & Allison, 1995).

*The weight fluctuation sub-scale* of the RRS measures various aspects of weight gain history, including maximum weight gain in a week, maximum weight loss in a month, and maximum weight over desired weight. This scale is measured on a fixed 5-point category, anchored at 0 to 5. Content of response categories varies, but usually represents a weight range figure. In order to increase ease of usage in a relatively young U.K. population the original imperial weight classifications (Lbs.) were transformed into metric units (Kg.). Total weight fluctuation scores are derived by summing over the weight fluctuation items. The higher the summed score the higher the weight fluctuation, ranging from 0 to 20. The weight fluctuation scale has demonstrated means ranging from 4.9, SD 2.8 (Wardle & Beales, 1987), to 5.8, SD 3.3 (Allison et al, 1992), and coefficient  $\alpha$  of between 0.70 to 0.80 (See Gorman & Allison, 1995 for review).

*The Goldfarb Fear of Fat Scale (GFFS: Goldfarb, Dykens, & Gerrard, 1985).* This scale represents a measure of fear of weight gain and fear of becoming overweight. It includes varied item statements relating to severe fear of gaining weight, risk of becoming overweight, weight control in order to prevent weight gain, and hunger as a means of preventing loss of control over eating and subsequent weight gain. Participants indicate their level of agreement with each statement of a 4-point Likert type scale anchored at 'very untrue' to 'very true', with higher scores indicating higher fears of weight gain and greater concerns to prevent becoming overweight or fat. The scale was originally developed from clinical interviews with anorexic patients, but has been used in non-clinical samples. Original mean fear of fat level for non-clinical college women was 25.50 (SD 9.67), with a Cronbach's  $\alpha$  of 0.85 indicating good internal reliability despite the apparently varied item content (Goldfarb et al, 1985). In a subsequent sample the GFFS mean for non-dieters was found to be 17.3 (no SD reported), and 23.9 (no SD reported) for dieters (Goldfarb et al, 1985).

*The Eating Disorders Inventory, Drive for Thinness, Body Dissatisfaction, and Bulimia sub-scales (taken from the EDI II: Garner, 1991).* The EDI II is a general measure of a variety of pathological eating behaviours and personality sub-scales related to Anorexia Nervosa and Bulimia Nervosa. Three such sub-scales are used in this study, each



involving a set of self-statements relating to the particular behaviours and concerns examined. Each sub-scale is scored on a 6-point Likert-type frequency scale ranging through 'always', 'usually', 'often', 'sometimes', 'rarely', and 'never'. Traditional scoring involves using only the three response categories most symptomatic of a particular sub-scale giving possible item scores of 0 to 3, with the least symptomatic response categories being scored as 0 depending on the particular item (i.e. based on reversed or non-reversed scoring).

*Drive for thinness* of the EDI was a scale derived from Bruch's (1973, 1982) conception of a 'relentless pursuit of thinness' that was a basic underlying factor diagnosis of eating disorders such as Anorexia Nervosa and Bulimia Nervosa. This is essentially a 7-item measure of pathological concerns with dieting, excessive preoccupation with weight, and an elevated fear of weight gain. Overall scores are obtained by summation, with reversed scoring on one item. Higher scores indicate greater levels of pathological concerns related to dieting and fear of weight gain. The non-clinical mean, as reported by Garner (1991), for this scale in a college aged female population was 5.5 (SD 5.5), reliabilities for non-clinical samples, ranging from 0.81 to 0.87 (Garner, 1991).

*The Bulimia sub-scale* of the EDI presents a 7-item measure of tendencies related to bingeing, i.e. engaging in uncontrolled overeating. Scale items are again varied, relating to eating due to negative affect, uncontrolled eating episodes, thoughts about overeating, and thoughts about vomiting. The non-clinical female college population mean reported by Garner (1991) was 1.2 (SD 1.9), while reliabilities based on internal consistency for this sub-scale have varied from relatively low scores of 0.69 to higher scores of 0.82 (Garner, 1991).

*The Body Dissatisfaction sub-scale* of the EDI focuses on dissatisfaction in relation to various body parts including stomach, thighs, buttocks, and hips, in addition to overall body shape. It contains 9 items. The non-clinical female college aged mean reported by Garner (1991), was 12.2 (SD 8.3). Internal consistency for this sub-scale is very high, ranging from 0.91 to 0.93 (Garner, 1991).

*The Beck's Depression Inventory (BDI: Beck, Ward, Medleson, Mock, & Erbaugh, 1961)* The BDI is a popular self-report measure for examining the presence of depression, and providing an estimate of depressive severity. The scale is composed of 21 item categories each consisting of 4 self-statements which individuals use to rate their current status. Current status is assessed in terms of how subjects have felt in the week past up to and including the day of test administration. Each statement has an associated numerical value ranging from 0-3, which is then summed for all selected statements to give the participant's overall BDI score. Individuals are invited to select more than one item within each category as appropriate, but only the more severe items are used in scoring. Obtained BDI scores are then compared with the following guidelines to determine presence and estimated level of depression: 0-9 normal, non-depressed range, 16-19 mild to moderately depressed, 20-29 moderate to severe depression, 30 to 63 severe depression. The BDI has proven effective in revealing depressive mood in normal populations, and has been in widespread use in a variety of contexts.

*The Marlowe-Crowne social desirability scale. (Crowne, & Marlowe, 1960: SDS).* This is the same measure used in study 2. It is a measure of the tendency to select responses on self-report measures that represent the most positive or socially acceptable position on particular item contents.

### Procedures.

The samples of participants were tested in groups of between 40 and 50 in laboratory rooms within the Psychology department at UCL. Hypnotizability was tested first using the same procedures and experimenter as study 2. Questionnaire measures were administered to participants either 4 or 7 days after hypnotizability testing, with packets of questionnaires being incorporated, as in study 3, in an overall testing session including measures of information processing styles related to another study conducted at the UCL Hypnosis unit. However, unlike study 2, no reference was made to the questionnaire measures being based on pathological or problematic eating concerns. Due to the large number of participants involved in each testing session body weight and height were obtained via self-report rather than directly assessed. In line with the ethical regulations used throughout this thesis, participants were informed that the study

involved hypnotizability, measures of eating attitudes, and personality tests, and that they could refuse participation at any stage without giving any reason. It was emphasised that non-participation would in no way reflect on their psychology course grade or any work related to their course. Participants were not paid for taking part. Three participants exercised their right to refuse to take part.

### Statistical Analyses.

SPSS versions 7.5 and 8 were used for general data screening, examination of distribution characteristics, and general statistics. Chi squared analyses were used to examine features of dietary demographics. Correlation analyses based on Pearson's product moment correlations were used throughout to examine associations between study variables. Factor analysis was used as a data reduction strategy and to examine potentially underlying association between the restraint, abnormal eating, and disinhibition variables used in this study. Various rotations using orthogonal (VARIMAX) and oblique (OBLIMIN) procedures were used in addition to descriptive tools such as Scree plots in order to find the most interpretable factor structure. Regression procedures were used to obtain factor scores for use in subsequent correlational analyses. Hypnotic Spectrum Analysis was used to find relationships between dietary restraint variables and specific items on the hypnotizability test used (HGSHS: A). The PRELIS (Jöreskog & Sörbom, 1999) program was used to conduct the biserial correlations that form the basis of Hypnotic Spectrum Analysis. Simple regression analyses were used to further explore associations uncovered using basic correlation procedures. A form of hierarchical regression was used to determine the possible moderating effects of hypnotizability and affective dissociation on relationships involving restraint and disinhibition of eating type measures.

## **5.3. Results.**

### **5.3.1 Data distributions and data cleaning.**

Prior to analysis the following variables were first examined for accuracy of data entry (scales from which variables are derived are placed in brackets): concern for dieting (RRS), cognitive restraint (TFEQ), fears of fat/weight gain (GFFS), Revised

Restraint scale total score (RRS), drive for thinness (EDI), body dissatisfaction (EDI), bulimic tendencies (EDI), depression (BDI), disinhibition of eating (TFEQ), susceptibility to hunger (TFEQ), weight fluctuation (RRS), cognitive dissociation (DES II), affective dissociation (PAS), and social desirability (SDS), and BMI. All variables scores were in the possible ranges, with acceptable means and standard deviations (see table 5.1 for means and reliabilities of the original data). The variables were subsequently examined for data skew, kurtosis, and univariate outliers.

In terms of the dietary restraint the following variables demonstrated adequate levels of skew and kurtosis, based on Tabachnick and Fidell's (1996) recommendation of 3.29 as a limit of population characteristics: concern for dieting (skew  $z = 0.77$ ; kurtosis  $z = 1.38$ ); the overall RRS (skew  $z = 1.86$ ; kurtosis  $z = 0.58$ ); and cognitive restraint (skew  $z = 1.87$ ; kurtosis  $z = 1.86$ ). Also within acceptable limits were disinhibition of eating (skew  $z = 0.79$ ; kurtosis  $z = 1.88$ ); susceptibility to hunger (skew  $z = 1.26$ ; kurtosis  $z = 1.40$ ); and weight fluctuation (skew  $z = 2.40$ ; kurtosis  $z = 1.03$ ). Body dissatisfaction (skew  $z = 2.76$ ; kurtosis  $z = -1.31$ ) and BMI (skew  $z = 2.14$ ; kurtosis  $z = 0.72$ ) were also within acceptable ranges. Hypnotic susceptibility (skew  $z = -1.37$ ; kurtosis  $z = -0.72$ ) and social desirability (skew  $z = 0.50$ ; kurtosis  $z = 0.83$ ) again presented acceptable distributions.

There were six variables with unacceptable skew and/or kurtosis: fears of fat/weight gain (skew  $z = 3.89$ ; kurtosis  $z = 0.31$ ); drive for thinness (skew  $z = 6.02$ ; kurtosis  $z = 1.63$ ); bulimic symptoms (skew  $z = 11.87$ ; kurtosis  $z = 18.36$ ); cognitive dissociation (skew  $z = 4.69$ ; kurtosis  $z = 0.78$ ); affective dissociation (skew  $z = 4.33$ ; kurtosis  $z = 1.25$ ); and depression (skew  $z = 6.77$ ; kurtosis  $z = 4.03$ ).

Outliers and the effect of transformations were examined for the poorly distributed variables. Fear of fat/weight gain demonstrated no excessive outliers, and displayed acceptable distribution properties after a square-root transformation (skew  $z = 2.50$ ; kurtosis  $z = 1.07$ ). Drive for thinness exhibited no excessive outliers, and while a square-root transformation improved skew to within acceptable limits ( $z = 2.37$ ), kurtosis became problematic ( $z = 6.02$ ), but the improvement of skew and the inability to remedy kurtosis under other transformations indicated adopting the square-root transformation for analysis. Bulimic tendencies had two outliers, but after a logarithmic

transformation distribution characteristics improved (skew  $z= 4.35$ ; kurtosis  $z= 0.05$ ), and the impact of the outlier was reduced ( $z =2.53$ ), but the skew remained. However, as the bulimic tendencies variable presented a serious J-shaped distribution, and only a logarithmic transformation ameliorated this problem, the logarithmic transformation was retained for further analyses with the proviso that a significant, though relatively slight, skew remained. There were no outliers on the DES II (cognitive dissociation), and a square-root transformation improved distribution properties (skew  $z = 1.88$ ; kurtosis  $z= -1.33$ ). Affective dissociation (PAS) also had no extreme outliers and use of a square-root transformation led to marginally acceptable properties (skew  $z= 3.24$ ; kurtosis  $z= 0.22$ ). There was one significant outlier for depression ( $z =3.31$ ), but again square-root transformation reduced outlier impact ( $z = 2.41$ ) and improved the distribution (skew  $z= 1.54$ ; kurtosis  $z= 0.15$ ).

The whole set of 15 variables, with the addition of weight and age were assessed for multivariate normality using Mahalanobis distances diagnostics (Tabachnick & Fidell, 1996), based on  $\chi^2$  with 17 degrees of freedom. Two extreme multivariate outliers were found (Mahalanobis distance = 56.69 and 42.84) and were excluded from further analyses. The final sample consisted of 123 cases.

#### Treatment of Missing data.

Almost all the variables had missing data to a moderate to low extent (percentage missing ranging from 0.8% to 16.8%). Cognitive dissociation, concern for dieting, hypnotizability, RRS total score, and RRS weight fluctuation were variables with low levels of missing data (less than 5%) and were replaced with serial means. Variables with more moderate missing data (less than 9% missing) such as bulimic tendencies; body dissatisfaction; Drive for thinness; Fears of fat/weight gain; Disinhibition of eating; Susceptibility to hunger were also replaced with serial means. Higher levels of missing data (BMI – 16.8% and TFEQ cognitive restraint – 10.4%) were first examined for differences on other variables when missing data was treated as a grouping strategy. There were no significant differences for the other variables between groups of missing and non-missing BMI data, indicating the use of serial mean replacement. However, individuals with missing data for TFEQ cognitive restraint had significantly lower scores in terms of hypnotizability at  $\alpha = 0.05$  ( $t_{118} = 2.97$ ,  $p = 0.004$ ),

which suggests that a limited sample size excluding missing data should also be used when analysing the TFEQ cognitive restraint sub-scale in relation to hypnotizability scores. With this caution in mind, serial means were used on this variable.

### 5.3.2. Overall means and reliabilities.

The raw data were used to examine scale means and reliabilities for the measures used in this study, and the results are presented below in table 5.1. with the exclusion of the multivariate outliers. A majority of measures showed good to excellent internal consistency, however, hypnotizability showed fairly low but adequate internal consistency. The means for drive for thinness and body dissatisfaction were comparable, if not slightly lower, than previous norms (Garner, 1991). The mean for bulimic tendencies was slightly higher than female student non-clinical norms, but still well below reported means for Bulimia Nervosa (11.6, SD 5.2: Garner, 1991) and bulimic type-Anorexia Nervosa (9.5, SD 5.8: Garner, 1991). These means suggest that this was not a clinical sample, at least in terms of eating disordered pathology. The DES II means were again relatively high for a non-clinical sample, but the lower median value of 15.00 indicates that skew may be presenting increased summary statistics for the DES.

**Table 5.1.**  
**Means and reliabilities for measures in study 4.**

	Means (SD)	Cronbach's $\alpha$	Transformations required
<b><u>Dietary restraint measures.</u></b>			
Concern over dieting (RRS)	8.14 (4.24)	.85	None
Cognitive restraint (TFEQ),	7.79 (5.72)	.90	None
Fear of fat and weight gain (GFFS),	18.86 (7.02)	.90	Square-root
Revised Restraint Scale (RRS).	13.00 (6.75)	.84	None
<b><u>Pathological Measures.</u></b>			
Drive for thinness (EDI)	4.33 (5.65)	.91	Square-root
Body dissatisfaction (EDI)	11.02 (8.45)	.94	None
Bulimic tendencies (EDI),	2.25 (3.78)	.90	Logarithmic
Depression (BDI)	7.8 (6.9)	*	Square-root
<b><u>Dietary disinhibition measures.</u></b>			
Disinhibition of eating (TFEQ)	7.50 (3.67)	.79	None
Susceptibility to hunger (TFEQ),	6.5 (3.04)	.72	None
Weight Fluctuation (RRS)	4.91 (3.55)	.76	None
<b><u>Dissociation measures.</u></b>			
Cognitive dissociation (DES II)	19.78 (13.92)	.94	Square-root
Affective dissociation (PAS)	46.71 (9.93)	.90	Square-root
<b>Hypnotizability (HGSHS: A)</b>	6.31 (2.48)	.67	None
<b>Social desirability (SDS).</b>	13.06 (4.81)	*	None

\* reliability data not available for these measures, as means and total scores were taken, with permission, from another unrelated study being conducted at the UCL Hypnosis unit.

### 5.3.3. Participant and dietary demographics.

A significant proportion of the participants were currently not on a diet (77.4%, 96/123;  $\chi^2 = 37.28$ ,  $p < 0.001$ ), the duration of those on a diet was 9 weeks (SD 20.50) with a wide spread. A significant proportion of participants had dieted at some time in the past (64.2%, 79/123;  $\chi^2 = 8.71$ ,  $p < 0.01$ ), with an average age of first diet of 14.97 (SD 3.24). A significant and extremely high proportion of participants did not want to be larger compared to those that did (96.7%, 119/123;  $\chi^2 = 102.12$ ,  $p < 0.001$ ), while a smaller, but significant majority wished to be slimmer than compared to those who did not (70.7%, 87/123;  $\chi^2 = 19.2$ ,  $p < 0.001$ ). In terms of perceived culturally attractive body size a sizeable majority indicated slim (75.2%) compared to medium (21.6%) or large (>1%), with these differences being significant on an overall  $\chi^2$  (113.2,  $p < 0.001$ ). This pattern of findings matches previous studies in this thesis, indicating that despite a majority of individuals who wished to be slimmer and did not wish to be larger, and a clear indication that cultural preference for attractive body size is slim, those actually dieting to lose weight formed a significantly small minority.

### 5.3.4. Correlations and factor analysis of dietary measures.

Correlations between the dietary measures used in this study, examining types of dietary restraint, abnormal eating measures, disinhibition of eating, depression, and social desirability are presented in table 5.2. Probability values are included as descriptive measures, as a Bonferroni correction would make most of these correlations non-significant, but as this matrix is presented as a prelude to factor analysis, there is no need to comment on the individual correlations. In addition, factor analysis procedures used in the subsequent section provide an indirect means of teasing out reliability related error from such correlations. It should be mentioned that there are high correlations between most eating related measures, although some variation exists, suggesting that factor analysis may well be applicable.

Table 5.2.

Correlation matrix of dietary restraint and related measures.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Concern for dieting	-														
2 Cognitive restraint	.78**	-													
3 Fears of fat/weight gain (sq)	.68**	.67**	-												
4 RRS	.89**	.74**	.68**	-											
5 Drive for thinness (sq)	.73**	.76**	.77**	.71**	-										
6 Body dissatisfaction	.65**	.59**	.63**	.66**	.70**	-									
7 Bulimic tendencies (log.)	.62**	.53**	.63**	.51**	.63**	.63**	-								
8 Depression (sq)	.35**	.16	.39**	.30**	.32**	.37**	.34**	-							
9 Disinhibition of eating	.54**	.44**	.48**	.57**	.53**	.57**	.76**	.29**	-						
10 Susceptibility to hunger	.33**	.19	.37**	.36**	.29**	.38**	.48**	.25**	.60**	-					
11 Weight fluctuation	.51**	.54**	.47**	.85**	.50**	.49**	.40**	.17	.46**	.28**	-				
12 Social desirability	-.01	.04	-.08	-.04	-.01	-.11	-.17	-.24*	-.20	-.14	-.17	-			
13 Age	-.00	.03	-.09	-.00	-.08	-.17	-.12	-.08	-.13	-.22	.08	.06	-		
14 BMI	.21	.08	.07	.32**	.17	.31	.12	-.06	.22	.15	.36	.14	.14	-	
15 Weight	.14	.04	-.03	.23*	.03	.25**	.09	-.12	.15	.12	.29**	.19	.19	.73**	-
16 Current dieting	.50**	.41**	.35**	.56**	.40**	.44**	.33**	.11	.42**	.30**	.48**	.19	-.02	.28**	.17

\*p<0.01, \*\*p<0.001. All ps are 2-tailed. Transformations: sq = square-root, log. = logarithmic.



### Factor analysis of eating and related measures.

Due to the relatively large numbers of variables used and the high, but potentially different levels of correlations between the measures used, a factor analysis was conducted as a data reduction strategy and to add interpretability to the results. The extraction of factors utilised principal factor analysis, with the number of factors extracted based upon the following guidelines: a) results of an initial principal components analysis, b) Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy; c) examination of Eigen values above 1; d) examination of a Scree plot; e) percentage of variance accounted for per factor and number of marker variables; and finally f) interpretability of component solutions under orthogonal and oblique rotation procedures.

The initial principal components analysis suggested 4 components with Eigen values above 1, accounting for 72.90 percent of the overall variance, with Scree plot 'elbows' (i.e. sharp discontinuities in plotted Eigen values) indicating between 2 and 5 factors. After varying the number of factors from 5 to 2, the best solution appeared to be a three factor structure, accounting for 65.22 % of the overall variance, based on an adequate KMO of 0.841. The factorability of this solution was adequate based on a determinant of 0.0002. The first factor, which accounted for 41.22% of the variance, appeared to be a motivation or drive for thinness and restraint concern factor, which also included elements of loss of control over eating and disinhibition of eating (Factor 1: Restraint and disinhibition factor). The second factor was clearly a weight related factor, accounting for 13.45 % of the variance (Factor 2: Weight). The final factor accounted for 10.54% of variance and suggests a purer loss of control over eating dimension, without the presence of restraint, which was also responsible for possible negative social desirability and depression (Factor3: Loss of control over eating). These three factors show good interpretability, separating off variance related to combined restraint concerns and disinhibition from that related generally to only disinhibition of eating. The presence of a few high marker variables for each factor supports the interpretability of this solution (marker variables are underlined in table 5.3).

**Table 5.3.****Factor structure of dietary restraint and related measures.**

	FACTOR COMPONENTS AFTER VARIMAX ROTATION		
	1	2	3
Drive for Thinness	<u>.89</u>		
Cognitive Restraint	<u>.88</u>		
Concern for dieting	<u>.86</u>		
Fear of Weight Gain	<u>.85</u>		
Body dissatisfaction	<u>.76</u>		
Bulimic tendencies	<u>.71</u>		.43
Weight fluctuation	.63	.39	
Weight		<u>.91</u>	
BMI		<u>.89</u>	
Susceptibility to Hunger	.30		<u>.70</u>
Age			-.63
Disinhibition of Eating	.58		.58
Social Desirability			-.49
Depression	.38		.39
<b>% Variance per factor</b>	<b>41.22</b>	<b>13.45</b>	<b>10.54</b>

Marker variables are underlined. Loadings were cut off at 0.29

Factor scores generated from the above factor analyses were calculated for use in examining associations with hypnotizability and the different types of dissociation.

### 5.3.5. Correlational analysis of Hypnotizability, dissociation, and dietary restraint/disinhibition measures.

Hypnotizability and the overall dissociation scores were examined for relationships with the measures of dietary restraint, dietary disinhibition, negative affect, and social desirability listed in tables 5.2. The correlation matrix of these associations is presented in table 5.4. Bonferroni corrections were adopted for hypnotic suggestibility, and the two dissociation scores, with a corrected  $\alpha$  of 0.003 for the correlations.

**Table 5.4.**  
**Correlations with hypnotizability and dissociation total scores.**

	Hypnotizability (HGSHS:A)	Cognitive dissociation (DES II √)	Affective Dissociation (PAS√)
<b><u>Dietary restraint measures.</u></b>			
Concern over dieting (RRS)	.14	.17	.35
Cognitive restraint (TFEQ),	.17	.19	.18
Fears of fat/weight gain (sq,GFFS),	.18	.18	.33*** (.36***)
Revised Restraint Scale (RRS)	.12	.22	.36***
<b><u>Dietary Pathology Measures.</u></b>			
Drive for thinness (sq, EDI)	.17	.18	.28*** (.30***)
Body dissatisfaction (EDI)	.10	.20	.29*** (.31***)
Bulimic tendencies (log., EDI),	.14	.12	.30*** (.33***)
Depression (sq, BDI)	-.01	.36***	.65***
<b><u>Dietary disinhibition measures.</u></b>			
Disinhibition of eating (TFEQ)	.28*** (.38***)	.14	.36
Susceptibility to hunger (TFEQ),	.12	.21	.29
Weight fluctuation (RRS)	.07	.22	.26
Social Desirability (SDS)	-.10	-.02	-.27
Currently dieting?	.13	.25	.19
Factor 1: Restraint and disinhibition.	.15	.21	.34***
Factor 2: Weight.	-.10	.01	-.15
Factor 3: Loss of control over eating.	.17	.14	.35***

\*\*\*p<0.001. 2-tailed.

Bonferroni corrected alpha set at p = 0.003

Transformations: sq = square-root, log. = logarithmic.

Diss-attenuated correlations in brackets.

In terms of hypnotizability, there were no significant associations with both cognitive restraint, fears of fat/weight gain and drive for thinness, measures related to varying levels of motivation to successfully restrain eating and consciously control eating behaviour. However, there was also an unpredicted, but highly significant, association between hypnotizability and disinhibition of eating, but no such association was found with other disinhibition related factors such as bulimic tendencies and weight fluctuation. Dis-attenuated correlations of the hypnotizability and disinhibition relationship gave a higher coefficient.

Cognitive dissociation was only significantly correlated with depression and current dieting. Affective dissociation, measured by the PAS, correlated significantly with a majority of the pathological measures, though it failed to correlate with cognitive restraint, susceptibility to hunger, social desirability, or current dieting. Dis-attenuated correlations demonstrated moderately higher levels. Depression expressed the highest correlation, as would be expected given the affective components of the PAS, however,

it may suggest a potential confounding effect, as depression tends to be correlated with most of the eating variables used in this study (see table 5.2). Affective dissociation correlated moderately with both the loss of control over eating and the dieting and disinhibition factors.

Partialling out BMI, age, and weight, did not affect the majority of correlations in table 5.4, and in most cases significance was slightly improved. The correlation between hypnotizability and fears of fat/weight gain increased to  $r = 0.20$  but was still non-significant ( $p = 0.02$ ), as did the correlation between affective dissociation and the disinhibition of eating factor ( $r = .30$ ,  $p = 0.001$ ). Certain correlations became less significant, specifically the correlations between cognitive dissociation, concern for dieting ( $r = 0.16$ ,  $p = 0.069$ ) and fears of fat/weight gain ( $r = 0.17$ ,  $p = 0.059$ ). Separate analyses were carried out partialling out depression and social desirability. This procedure had little impact on correlations involving hypnotizability. However, partialling out depression and social desirability did impact heavily on correlations involving the dissociation scales, and these effects are best presented in table 5.5 below.

**Table 5.5.**  
**Correlations with dissociation, partialling out social desirability and depression.**

	Cognitive dissociation (DES II sq)	Affective Dissociation (PAS sq)
<b><u>Dietary restraint measures.</u></b>		
Concern over dieting (RRS)	.05	.20
Cognitive restraint (TFEQ),	.14	.12
Fears of fat/weight gain (sq,GFFS),	.05	.13
Revised Restraint Scale (RRS)	.13	.23**
<b><u>Dietary Pathology Measures.</u></b>		
Drive for thinness (sq, EDI)	.07	.11
Body dissatisfaction (EDI)	.10	.11
Bulimic tendencies (log., EDI),	-.00	.09
<b><u>Dietary disinhibition measures.</u></b>		
Disinhibition of eating (TFEQ)	.05	.20
Susceptibility to hunger (TFEQ),	.14	.14
Weight fluctuation (RRS)	.17	.20
Currently dieting?	.22	.19
Factor 1: Restraint and disinhibition.	.09	.16
Factor 2: Weight.	.09	.00
Factor 3: Loss of control over eating.	.03	.07

\* $p < 0.05$ , \*\* $p < 0.01$ .

Bonferroni alpha = 0.003

Transformations:  $\sqrt{\quad}$  = square-root, log. = logarithmic.

In effect, partialling out depression and social desirability reduced correlations based on both types of dissociation to non-significance. The only correlation to maintain a reasonable level of significance, but still below the Bonferroni threshold was between affective dissociation and the overall RRS scores. The partial correlations using only depression as a confound led to very similar correlations to those obtained when both social desirability and depression were partialled out, indicating the depression is the major confound and not social desirability. Clearly, depression plays a significant role in the overall correlations between dissociation, especially affective dissociation, and the measures of dietary restraint and disinhibition used in this study.

In terms of the inter-correlations between the hypnotizability and dissociation measures (table 5.6), there was no correlation between hypnotizability and either cognitive dissociation or affective dissociation; however, a moderate to strong correlation was found between the two dissociation measures. The moderate inter-correlation between cognitive and affective types of dissociation demonstrates that they are related, yet different factors.

**Table 5.6.**

**Inter-correlations between hypnotizability and dissociation measures.**

<i>r</i> ( <i>n</i> = 123)	Hypnotizability (HGSHS:A)	Cognitive Dissociation (DES II-sq)
Cognitive Dissociation ( $\sqrt{\text{DES II}}$ )	.06	-
Affective dissociation (PAS)	.07	.51*** (.55***)

\*\*\**p*<0.001. Transformations: sq = square-root.

Dis-attenuated correlations in brackets.

5.3.5.2.Hypnotic Spectrum Analysis of factor scores on hypnotizability items scores.

Hypnotic Spectrum Analysis (Balthazard & Woody, 1992) provides a means of examining if trend exist between sub-groups of hypnosis item, such as the easier and more difficult items, and external variables of interest. This technique can be used to assess if the combination of measures examined using the factor analysis above relate to different processes that may underlie specific item sub-groups. The easier items are,

according to Woody et al (1997) related to more waking suggestibility factors, and the harder items are possibly related to attentional factors such as absorption (Balthazard & Woody, 1992).

Hypnotic Spectrum analysis, named spectral analysis by the authors, calculates biserial correlations between an external variable and the dichotomous items that constitute the hypnotizability scale. This procedure allows for the examination of trends between the easier and harder items on the hypnotizability test in relation to a variable of interest, in this case the factor scores derived from the previous factor analysis. The results of this analysis are presented in table 5.7.

**Table 5.7.**  
**Hypnotic Spectrum Analysis of eating factors.**

Hypnotizability items	Factor 1 Restraint and disinhibition	Factor 2 Weight	Factor 3 Loss of control over eating
1 Hand Lowering	.24	.05	.31
2 Eye Closure	-.15	-.10	.11
3 Head Sway	.10	.07	-.03
4 Moving 'magnetic' Hands	.12	-.23	.28
5 Finger Lock	.10	.15	.10
6 Arm Rigidity	.03	-.05	.06
7 Communication Inhibition	.25	.02	.18
8 Arm Immobilisation	.42**	.17	.08
9 Amnesia	.06	.11	.16
10 Eye Catalepsy	.01	-.02	.05
11 Post-hypnotic suggestion	.08	-.07	.03
12 Experience of fly	-.01	-.09	-.12

\*p < 0.05. \*\*p < 0.01

Bonferroni corrected alpha = 0.004

Hypnotizability items placed in order of difficult based on pass rates specific to this study. 1 is easiest 2 is hardest.

Examining the hypnotic spectrum analysis using the eating factors did not reveal any blatant pattern of correlations in terms of hypnosis item difficulty. None of the correlations were significant at the p = 0.004 Bonferroni corrected level calculated, except arm rigidity and disinhibition of restraint. There are no trends to indicate that particular sub-groups of hypnotic items cluster to high correlations. It appears that item analysis has not increased interpretation of hypnotizability scores in relation to the eating, restraint, weight or disinhibition related factors.

### 5.3.5.3. Correlations involving the dissociation sub-scales.

As in study two, the dissociation scales were broken down into previously reported sub-scale scores (e.g. Carlson & Putnam, 1993), including the two dissociative taxons from the DES II. Means for and internal reliabilities for the relevant dissociation sub-scale are printed below in table 5.8.

Before correlation analyses the usual examinations of the data distribution were conducted. In terms of the DES II sub-scales, no outliers were found on absorption, de-personalisation/de-realisation, or amnesia, however, only the absorption sub-scale presented with reasonable skew ( $z = 2.95$ ) and kurtosis ( $z = -0.09$ ). The DES II de-personalisation/de-realisation presented significant skew ( $z = 9.08$ ) and kurtosis ( $z = 10.34$ ) whilst the amnesia factor had significant skew ( $z = 6.66$ ; kurtosis = 2.22). Square-root transformations of the de-personalisation/de-realisation and amnesia factors improved their skew and kurtosis (de-personalisation/de-realisation; skew = 2.73, kurtosis = -0.35; Amnesia skew = 2.84, kurtosis = -2.03) to within acceptable limits. In terms of the DES II taxons both showed unacceptable skew (pathological  $z = 8.18$ ; non-pathological  $z = 4.20$ ) with excessive kurtosis for the pathological taxon ( $z = 7.17$ ), but not for the non-pathological taxon ( $z = 0.23$ ). There were two extreme outliers on the pathological taxon sub-scale scores ( $z = 3.75$  and  $z = 3.65$ ), but after a square-root transformation the impact of these outliers was reduced and distribution characteristics improved to within acceptable limits (skew  $z = 2.77$ ; kurtosis  $z = -0.31$ ). No outliers were found for non-pathological dissociation, and again a square-root transformation substantially improved the distribution (skew  $z = 2.77$ ; kurtosis  $z = 0.31$ ).

**Table 5.8.**  
**Means and reliabilities of dissociation sub-scales.**

	Means (SD)	Cronbach's $\alpha$	Transformation required.
Absorption (DES II)	27.0 (17.83)	.89	None
De-realisation/de-personalisation (DES II)	9.22 (11.84)	.85	Square-root
Amnesia (DES II)	9.01 (11.84)	.54	Square-root
Pathological Taxon (DES II)	10.71 (12.79)	.85	Square-root
Non-Pathological Taxon (DES II)	23.08 (15.19)	.92	Square-root
Modification of affect (PAS)	22.21 (5.19)	.84	Square-root
Modification of control (PAS)	15.95 (4.09)	.72	Logarithmic
Modification of cognition (PAS)	8.36 (1.71)	.51	None

In terms of the PAS sub-scales, there was excessive skew for each of the PAS factors, with some degree of excessive kurtosis: modification of affect (skew  $z= 4.05$ , kurtosis  $z = 0.42$ ), modification of control (skew  $z= 5.25$ , kurtosis  $z= 2.76$ ), except for modification of cognition scale (skew  $z= 2.04$ , kurtosis  $z= 0.03$ ). A square root transformation ameliorated distribution problems for the modification of affect sub-scale (skew = 3.01, kurtosis = 0.39), with no outliers present before or after transformation. No outliers were found prior to transformation. For modification of control and a natural logarithmic transformation alleviated distribution problems (skew  $z= 2.52$ , kurtosis  $z= -0.03$ ).

**Table 5.9.**

**Correlations with cognitive dissociation (DES II) sub-factors and DES II taxon sub-scales.**

	DES II Sub-scales.			DES II Taxons(√)	
	Absorption	Depersonalisation/ De-realisation (sq)	Amnesia (sq)	Pathological	Non- Pathological
Concern over dieting (RRS)	.18 (.05)	.06 (-.03)	.09 (.01)	.12 (.02)	.18 (.06)
Cognitive restraint (TFEQ)	.18 (.13)	.17 (.13)	.14 (.11)	.18 (.14)	.19 (.13)
Fears of fat/weight gain (sq GFFS)	.19 (.05)	.12 (.02)	.13 (.06)	.12 (.01)	.19 (.06)
Revised Restraint Scale (RRS)	.21 (.11)	.14 (.07)	.14 (.09)	.15 (.07)	.23** (.14)
Drive for thinness (sq EDI)	.15 (.04)	.10 (.03)	.09 (.04)	.14 (.05)	.19 (.08)
Body dissatisfaction (EDI)	.16 (.06)	.22 (.06)	.21 (.17)	.13 (.03)	.21 (.12)
Bulimic tendencies (log EDI)	.11 (-.01)	.14 (.05)	.11 (.06)	-.10 (.02)	.11 (-.01)
Depression (sq BDI)	.36***	.26**	.18	.30***	.36***
Disinhibition of eating (TFEQ)	.12 (.02)	.14 (.07)	.05 (.01)	.14 (.05)	.14 (.05)
Susceptibility to hunger (TFEQ)	.23** (.16)	.17 (.11)	.01 (-.02)	.17 (.15)	.22 (.15)
Weight fluctuation (RRS)	.19 (.14)	.20 (.17)	.14 (.15)	.15 (.18)	.23 (.18)
Social desirability (SDS)	-.03	-.07	.04	-.08	-.01
Currently dieting?	.23** (.20)	.19 (.18)	.11 (.08)	.18 (.16)	.25** (.22)
Factor 1: disinhibition and restraint	.21 (.08)	.15 (.06)	.16 (.09)	.17 (.07)	.22 (.09)
Factor 2: Weight	-.06 (.01)	-.01 (.04)	.06 (.11)	-.08 (-.01)	.03 (.12)
Factor 3: Loss of control over eating	.14 (.02)	.15 (.05)	-.01 (-.04)	.13 (.01)	.14 (.03)

\*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

Bonferroni correction for  $\alpha = 0.003$

Transformations:  $\sqrt{\quad}$  = square-root, log = logarithmic.

NOTE: Numbers in brackets indicate correlations with social desirability and depression partialled out, followed by significance level, if significant, of partial correlations.



Correlations involving the cognitive dissociation sub-scales are presented above in table 5.9; Bonferroni corrections is the same as in previous analysis and was set at  $p = 0.003$ . Correlations with the effects of social desirability and depression partialled are shown in brackets. A general examination of initial correlations indicates that only the absorption factor, and the related non-pathological absorption and imagination taxon sub-scale, came close to significant correlations, especially with current dieting. Partialling out age, BMI, and weight did not affect these initial values.

Depression is a major affect-related component that may be related to disinhibition of eating using Heatherton & Baumeister's (1991) Escape Hypothesis. McManus (1994) suggested that the Escape Model implies a potential relationship with dissociation, and therefore depression need to be partialled out of potential relationships between disinhibition of eating type measures and dissociation measures. Social desirability may also be confounded in these relationships and also need to be accounted for. When removing the effects of depression and social desirability all correlations become greatly reduced in magnitude and non-significant. This suggests a potentially significant underlying negative affective feature of these cognitive-type dissociation sub-scales that occurs throughout the sub-scales, with the exception of amnesia.

In terms of affective dissociation (PAS) sub-scales, initial correlations (table 5.10) indicated that the modification of affect sub-scale significantly correlated with measures related to weight/restraint concerns, in addition to measures of disinhibition and binge tendencies. The high correlation with depression and moderate correlation with social desirability again urged caution, and when these factors are partialled out there is a very marked effect. Modification of affect fails to correlate with any of the measures. Modification of control correlations become reduced in magnitude and significance, while previous relationships with fears of fat/weight gain, bulimic tendencies, and weight fluctuation, become non-significant. However, in terms of modification of control only, significant relationships are retained with concern for dieting (dis-attenuated  $r = .37$ ), and the overall RRS (dis-attenuated  $r = .43$ ). Also, close to significant correlations were found with body dissatisfaction, weight fluctuation, and current dieting, in relation to modification of control.

**Table 5.10.**  
**Correlations with the PAS sub-scales.**

	PAS factor sub-scales		
	Modification of affect (sq)	Modification of control (log)	Modification of cognition
Concern for dieting (RRS)	.31*** (.15)	.41*** (.29***)	.06 (-.06)
Cognitive restraint (TFEQ),	.14 (.07)	.23** (.18)	.10 (.01)
Fears of fat/weight gain (sq GFFS)	.31*** (.10)	.36*** (.17)	.15 (.01)
Revised Restraint Scale (RRS)	.35*** (.16)	.43*** (.34***)	.09 (-.03)
Drive for thinness (sq EDI)	.25** (.08)	.32*** (.18)	.04 (-.07)
Body dissatisfaction (EDI)	.21 (.01)	.39*** (.25**)	.03 (-.09)
Bulimic tendencies (log EDI),	.24** (.02)	.33*** (.14)	.10 (-.02)
Depression (sq BDI)	.61***	.62***	.34***
Disinhibition of eating (TFEQ)	.31*** (.14)	.39*** (.26)	.10 (-.01)
Susceptibility to hunger (TFEQ),	.27** (.13)	.30*** (.18)	.04 (-.05)
Weight Fluctuation (RRS)	.19 (.11)	.33*** (.30**)	.10 (.05)
Social desirability (SDS)	-.25**	-.28***	-.01
Currently dieting?	.15 (.14)	.23** (.26**)	.06 (.03)
Factor 1: restraint and disinhibition	.29*** (.10)	.39*** (.25**)	.09 (-.03)
Factor 2: Weight	-.19 (-.06)	-.07 (.09)	-.08 (.01)
Factor 3: Loss of control over eating	.33*** (.07)	.35*** (.07)	.13 (-.01)

\*\*p<0.01, \*\*\*p<0.001.

Bonferroni correction to alpha = 0.003

Transformations: sq = square-root, log. = logarithmic.

NOTE: Numbers in brackets indicate correlations with social desirability and depression partialled out, followed by significance level, if significant, of partial correlations.

### 5.3.6. Regression analyses for non-pathological dietary restraint variables.

Explorative standard regressions were done to examine the main hypotheses forming the basis of this thesis, the relationship of multiple variables to non-clinical features of dietary restraint and disinhibition. The first set of standard regression procedures examined the possibility of unique predictive effects of variables in relation to cognitive restraint and concern for dieting. In the initial regression models the following variables were used: hypnotizability (HGSHS:A), cognitive dissociation (DES

II), affective dissociation (PAS), depression (BDI), social desirability (SDS), body dissatisfaction (EDI), concern for dieting (RRS), fears of fat/weight gain (GFFS), disinhibition of eating (TFEQ), susceptibility to hunger (TFEQ), weight fluctuation, age, BMI, weight. In order to reduce the number of variables analysed, drive for thinness, bulimic tendencies, and the dissociation sub-scales of the DES II or PAS were not included in the regression equations detailed here. The regression equations used here are similar to those used in study 2, but include depression, body dissatisfaction, weight fluctuation, and fears of fat as variables of relevance. Separate standard regression analyses were conducted using the cognitive restraint and concern for dieting measures as dependants, with all other variables entered into the equation simultaneously. These regression equations are summed up in table 5.11, where only the significant predictors are shown.

### Regression models of cognitive restraint

**Table 5.11.**  
**Standard regressions for cognitive restraint.**

	$\beta$	t	p	Semi-partial r
<b><u>Cognitive restraint with concern for dieting included in model.</u></b>				
Concern for dieting (RRS)	.49	5.90	.001	.31
Fears of fat/weight gain (GFFS sq)	.24	2.66	.009	.13
Weight fluctuation (RRS)	.20	2.93	.004	.15
Cognitive dissociation (DES sq)	.13	2.10	.037	.11
Depression (sq, BDI)	-.15	-2.05	.042	-.10
<b><u>Cognitive restraint without concern for dieting included in model.</u></b>				
Fears of fat/weight gain (GFFS sq)	.42	4.40	.001	.26
Weight fluctuation (RRS)	.25	3.21	.002	.21
Body dissatisfaction (EDI)	.24	2.30	.023	.13
Disinhibition of eating (TFEQ)	.18	1.98	.050	.11

Transformations: sq = square root.

For cognitive restraint as a dependent, the only significant predictors turned out to be, in order of coefficient magnitude, concern for dieting, fears of fat/weight gain, weight fluctuation, cognitive dissociation, and depression. This model obviously included concern for dieting. There were no predictive effects of hypnotizability or affective dissociation. However, when concern for dieting was not included in the

regression equation, the only significant predictors were fears of fat/weight gain, weight fluctuation, body dissatisfaction, and disinhibition of eating. Fears of fat/weight gain appeared as the most stable predictor of cognitive restraint, whilst relationships with cognitive dissociation, depression, disinhibition of eating, and body dissatisfaction depend on whether concern for dieting is included in the regression equation. Predictive variance due to cognitive dissociation appeared to contribute only a very small, but significant level of variance to cognitive restraint and only occurred when variance due to concern for dieting was partialled out.

Regression models of concern for dieting.

A second set of regression equations were calculated for concern for dieting (see table 5.12). When cognitive restraint was included as a predictor, only affective dissociation, and cognitive restraint, were significant predictors, with social desirability close to significance ( $\beta = .11$ ,  $t = 1.94$ ,  $p = 0.054$ ). When cognitive restraint was not included in the regression equation, fear of fat became a significant predictor, as did social desirability and disinhibition of eating. From these results it is clear that the extent to which features of dissociation predict concern for dieting is linked to whether variance based on cognitive restraint is included in the regression model.

**Table 5.12.**  
**Standard regression model for concern for dieting.**

	$\beta$	t	p	Semi-partial r
<u>Concern for dieting with cognitive restraint included in regression.</u>				
Cognitive restraint (TFEQ)	.49	5.90	.001	.30
Affective dissociation (sq PAS)	.16	2.09	.038	.10
<u>Concern for dieting with cognitive restraint excluded from regression.</u>				
Fears of fat/weight gain (sq GFFS)	.37	3.88	.001	.23
Disinhibition of eating (TFEQ)	.21	2.30	.023	.13
Social desirability (SDS)	.15	2.48	.015	.14

Transformations: sq = square root.

## Regression models of disinhibition of eating.

The same set of variables and regression procedures were used to examine disinhibition of eating and susceptibility to hunger, only that the restraint measures (cognitive restraint and concern for dieting) were entered as a separate block after inclusion of the other variables, in order to ascertain their effect on the model. In terms of disinhibition of eating (table 5.13), in the first model susceptibility to hunger, hypnotizability, weight fluctuation, and body dissatisfaction predicted disinhibition of eating under the exclusion of the restraint measures (Block 1, table 5.13). Inclusion of the restraint variables led to a small, but significant change in predictability ( $R^2$  change = 0.028,  $p = 0.024$ ), but only susceptibility to hunger, hypnotizability, and body dissatisfaction were significant predictors (Block 2, table 5.13).

**Table 5.13.**  
**Block based regression analysis of disinhibition of eating**

	$\beta$	t	p	Semi-partial r
<b><u>BLOCK 1- restraint measures excluded</u></b>				
Susceptibility to hunger (TFEQ)	.39	5.40	.001	.33
Body dissatisfaction (EDI)	.31	3.07	.003	.18
Hypnotizability	.18	2.86	.005	.17
Weight fluctuation (RRS)	.17	2.18	.031	.13
<b><u>BLOCK 2-restraint measures included</u></b>				
Susceptibility to hunger (TFEQ)	.39	5.42	.001	.33
Body dissatisfaction (EDI)	.24	2.28	.024	.13
Hypnotizability	.18	2.98	.003	.17

Note: Disinhibition of eating was the dependent variable. The first block represents variables entered simultaneously into the regression model, excluding cognitive restraint and concern for dieting. The second block indicates entry of the same variables, but with the inclusion of cognitive restraint and concern for dieting.

In terms of disinhibition of eating, table 5.13 indicates that a small, yet significant amount of variance in disinhibition of eating was predicted by hypnotizability, and this remained robust whether or not the restraint measures were included, and represented hypnotic suggestibility without variance due to the dissociation of social desirability measures. However, the clearest and most stable

predictors of disinhibition of eating were susceptibility to hunger and body dissatisfaction.

For completeness, susceptibility to hunger was regressed on all the other variables, except the restraint measures, led to only one significant predictor: disinhibition of eating ( $\beta = 0.53$ ,  $t = 5.40$ ,  $p < 0.001$ ) and age ( $\beta = -0.22$ ,  $t = -2.85$ ,  $p = 0.005$ ). Including the restraint variables did not significantly increase the predicted variance ( $R^2$  change = 0.018,  $p > 0.1$ ), but did affect the significant predictors, leading to significant coefficients for fear fat/weight gain ( $\beta = .24$ ,  $t = 2.01$ ,  $p = 0.047$ ), disinhibition of eating ( $\beta = 0.54$ ,  $t = 5.42$ ,  $p < 0.001$ ), and age ( $\beta = -0.20$ ,  $t = -2.58$ ,  $p = 0.011$ ).

#### 5.3.6.2. Assessing Potential Moderating Effects of hypnotizability and dissociation between non-clinical variables.

Moderating effects occur where one variable influences the magnitude of a relationship between two other variables (Baron & Kenny, 1986). Moderating effects between variables are the equivalent of an interaction term in ANOVA (Cohen & Cohen, 1983), but can be examined in multiple regression by using products of variables (interaction terms, e.g.  $m \times v$ ) after accounting for the individual variance for the components of such terms ( $m$  and  $v$ ). In practice, the first element of a potential relationship is entered as a dependent variable in a multiple regression ( $d$ ), the second element of the relationship is then entered as the first predictor ( $v$ ) followed by the moderator ( $m$ ), and finally the interaction term is entered ( $m \times v$ ). A significant model and interaction term indicates that the moderator influences the relationship between the dependent variable and the first predictor.

As a final analysis in this study, the possibility that hypnotizability and dissociation acts as moderators on various relationships between dietary restraint variables and dietary disinhibition variables was examined. The first moderating effect examined was the effect of hypnotizability on the relationship between restraint concerns and factors such as fears of fat/weight gain and body dissatisfaction, which the relationships between may be moderated by hypnotizability based on the Socio-Hypnotic hypothesis. The relationship between fears of fat/weight gain and cognitive

restraint was analysed first, with the steps in this regression model are illustrated in table 5.14. The regression clearly shows that while fears of fat and cognitive restraint are well related, hypnotizability does not interact with either of these variables to moderate the relationships between them.

**Table 5.14.**  
**Examination of possible moderating effects of hypnotizability between cognitive restraint and fear of fat.**

a) Dependent : Cognitive Restraint (TFEQ)	Change in R <sup>2</sup>	b) Dependent: Fears of fat/weight gain. (sq, GFFS)	Change in R <sup>2</sup>
Step 1: Fears of fat/weight gain (sq, GFFS)	.45***	Step 1: Cognitive Restraint (TFEQ)	.45***
Step 2: Hypnotizability	.001	Step 2: Hypnotizability	.007
Step 3: Hypnotizability x fear of fat	.000	Step 3: Hypnotizability x cognitive restraint.	.004

\*\*p < 0.01, \*\*\*p < 0.001 for change in R<sup>2</sup>.  
Transformations: sq = square-root

The relationship between body dissatisfaction and cognitive restraint was examined next for the potential moderating effects of hypnotizability (table 5.15). Again, body dissatisfaction and cognitive restraint accounted for a significant proportion of the variance for each other, but hypnotizability and the interaction term did not account for any significant portion of R<sup>2</sup>, when either cognitive restraint or body dissatisfaction were used as a dependent.

**Table 5.15.**  
**Examination of possible moderating effects of hypnotizability between cognitive restraint and body dissatisfaction.**

c) Dependent : Cognitive Restraint (RRS)	Change in R <sup>2</sup>	d) Dependent: Body dissatisfaction (EDI)	Change in R <sup>2</sup>
Step 1: Body dissatisfaction (EDI)	.373***	Step 1: Cognitive restraint (TFEQ)	.373***
Step 2: Hypnotizability	.009	Step 2: Hypnotizability	.000
Step 3: Hypnotizability x body dissatisfaction	.004	Step 3: Hypnotizability x cognitive restraint	.002

\*\*p < 0.01, \*\*\*p < 0.001 for change in R<sup>2</sup>.

Separate regressions were conducted with concern for dieting instead of cognitive restraint, in relation to fears of fat/weight gain and body dissatisfaction (table 5.16 for fears of fat/weight gain, table 5.17 for body dissatisfaction).

**Table 5.16**

**Examination of possible moderating effects of hypnotizability between concern for dieting and fear of fat.**

a) Dependent : Concern for dieting (RRS)	Change in R <sup>2</sup>	b) Dependent: Fears of fat/weight gain (sq, GFFS)	Change in R <sup>2</sup>
Step 1: Fears of fat/weight gain (sq, GFFS)	.476***	Step 1: Concern for dieting (RRS)	.476***
Step 2: Hypnotizability	.000	Step 2: Hypnotizability	.009
Step 3: Hypnotizability x fear of fat	.002	Step 3: Hypnotizability x concern for dieting	.000

\*\*p < 0.01, \*\*\*p < 0.001 for change in R<sup>2</sup>.

Transformations: sq = square-root

**Table 5.17**

**Examination of possible moderating effects of hypnotizability between concern for dieting and body dissatisfaction.**

a) Dependent : Concern for dieting (RRS)	Change in R <sup>2</sup>	b) Dependent: Body dissatisfaction (EDI)	Change in R <sup>2</sup>
Step 1: Body dissatisfaction (EDI)	.419**	Step 1: Concern for dieting (RRS)	.419**
Step 2: Hypnotizability	.006	Step 2: Hypnotizability	.000
Step 3: Hypnotizability x body dissatisfaction	.001	Step 3: Hypnotizability x concern for dieting	.002

\*\*p < 0.01, \*\*\*p < 0.001 for change in R<sup>2</sup>. A significant change R<sup>2</sup> for the interaction term would indicate a potential moderating effect.

As a final examination of moderating effects for hypnotizability, the relationship between body dissatisfaction and fear of fat was regressed with hypnotizability and interaction terms (table 5.18). Again, no significant moderating effect emerged, though each of the variables in the original relationship predicted a significant amount of R<sup>2</sup> for each other.

**Table 5.18**

**Examination of possible moderating effects of hypnotizability between fears of fat/weight gain and body dissatisfaction.**

a) Dependent: Body Dissatisfaction (EDI)	Change in R <sup>2</sup>	b) Dependent: Fears of fat/weight gain (sq, GFFS)	Change in R <sup>2</sup>
Step 1: Fears of fat/weight gain (sq, GFFS)	.482**	Step 1: Body dissatisfaction	.482**
Step 2: Hypnotizability	.001	Step 2: Hypnotizability	.015
Step 3: Hypnotizability x fear of fat	.001	Step 3: Hypnotizability x concern for dieting	.003

\*\*p < 0.01, \*\*\*p < 0.001 for change in R<sup>2</sup>.



As the Dissociative Escape hypothesis predicts a moderating effect of such dissociation between disinhibition of eating and the aversive realisations that potentially form a part of both restraint concerns and body dissatisfaction disinhibition, the nature of affective dissociation as moderator between these variables was examined.

No moderating effect was found for affective dissociation of the relationships between disinhibition and the dietary restraint measures (table 5.19 for cognitive restraint, table 5.20 for concern for dieting). In terms of body dissatisfaction and disinhibition of eating and fears of fat/weight gain and disinhibition of eating, again affective dissociation did not produce any significant moderating effect (Table 5.21.).

**Table 5.19.**

**Examination of possible moderating effects of affective dissociation between disinhibition of eating and cognitive restraint.**

a) Dependent : Disinhibition of eating (TFEQ)	Change in R <sup>2</sup>	b) Dependent: Cognitive Restraint (TFEQ)	Change in R <sup>2</sup>
Step 1: Cognitive Restraint (TFEQ)	.193***	Step 1: Disinhibition of eating (TFEQ)	.193***
Step 2: Affective Dissociation (sq, PAS)	.077***	Step 2: Affective Dissociation (sq, PAS)	.001
Step 3: Affective Dissociation x cognitive restraint	.000	Step 3: Affective Dissociation x Disinhibition of eating	.010

\*\*p < 0.01, \*\*\*p < 0.001 for change in R<sup>2</sup>. A significant change R<sup>2</sup> for the interaction term would indicate a potential moderating effect.

**Table 5.20.**

**Examination of possible moderating effects of affective dissociation between disinhibition of eating and concern for dieting.**

a) Dependent : Disinhibition of eating (TFEQ)	Change R <sup>2</sup>	b) Dependent: Concern for dieting (RRS)	Change R <sup>2</sup>
Step 1: Concern for dieting (RRS)	.293***	Step 1: Disinhibition of eating (TFEQ)	.293***
Step 2: Affective Dissociation (sq, PAS)	.029*	Step 2: Affective Dissociation (sq, PAS)	.032*
Step 3: Affective Dissociation x Concern for dieting	.004	Step 3: Affective Dissociation x Disinhibition of eating	.007

\*\*p < 0.01, \*\*\*p < 0.001 for change in R<sup>2</sup>.

Transformations: sq = square-root

**Table 5.21.****Examination of possible moderating effects of affective dissociation between disinhibition of eating and body dissatisfaction.**

a) Dependent : Disinhibition of eating (TFEQ)	Change in R <sup>2</sup>	b) Dependent: Body dissatisfaction (EDI)	Change in R <sup>2</sup>
Step 1: Body Dissatisfaction (EDI)	.341***	Step 1: Disinhibition of eating (TFEQ)	.341***
Step 2: Affective Dissociation sq. (PAS)	.037**	Step 2: Affective Dissociation (sq. PAS)	.008
Step 3: Affective Dissociation x body dissatisfaction	.000	Step 3: Affective Dissociation x Disinhibition of eating	.012

\*\*p < 0.01, \*\*\*p < 0.001 for change in R<sup>2</sup>.

Transformations: sq = square-root

Finally, fears of fat/weight gain may also be seen as a source of aversive self-realisation that may trigger of affective dissociative defences leading to increased disinhibition. However, again no moderating effect emerged (Table 5.22), but it should be mentioned that the affective dissociation x disinhibition reaction did come close to a liberal p value of 0.1 suggested by some researchers as applicable for seeking out interaction affects (e.g. Pedahazur, 1982), although given the number of regressions tested this would be clearly inappropriate under conditions of Bonferroni correction.

**Table 5.22.****Examination of possible moderating effects of affective dissociation between disinhibition of eating and fears of fat/weight gain.**

a) Dependent : Disinhibition of eating (TFEQ)	Change in R <sup>2</sup>	b) Dependent: Fears of fat/weight gain (sq, GFFS)	Change in R <sup>2</sup>
Step 1: Fears of fat/weight gain (sq, GFFS)	.233***	Step 1: Disinhibition of eating (TFEQ)	.233***
Step 2: Affective Dissociation (sq, PAS)	.039*	Step 2: Affective Dissociation (sq, PAS)	.038*
Step 3: Affective Dissociation x Fears of fat/weight gain	.000	Step 3: Affective Dissociation x Disinhibition of eating	.015

\*\*p < 0.01, \*\*\*p < 0.001 for change in R<sup>2</sup>.

Transformations: sq = square-root

To summarise the moderator analysis, no effects were found for predicted moderating influences of either hypnotizability or proneness to affective dissociation in a number of potential relationships.

#### **5.4. Discussion of study 3.**

In sum, the expected relationships appear to have been inverted. Hypnotizability does not appear related to restraint related factors as suggested by the Socio-Hypnotic hypothesis, but is instead related to disinhibition of eating. Hypnotic items potentially related to forms of waking suggestibility failed to correlate with general factors related to disordered eating, indicating further lack of support for the Socio-Hypnotic hypothesis. Cognitive and affective dissociation were not related to disinhibition when accounting for a number of factors, especially depression, although weak zero-order correlations between loss of control dissociation and restraint concerns still held.

#### General factors underlying features of restraint and disinhibited type eating.

This study set out to broaden the examination of possible associations between various measures of eating behaviours and attitudes, in relation to features of hypnotizability and dissociation. An important aspect of this study was the investigation of potential covariates for such relationships, especially in factors such as depression and social desirability. These measures included, in addition to features of dietary restraint, body dissatisfaction, fears of fat and weight gain, weight fluctuation, and more pathological factors such as bulimic tendencies and drive for thinness. The eating measures examined were all well inter-correlated, supporting a factor analytic approach to examining common features of the domain of measurement. Depression was moderately correlated with all the eating and restraint concern measures, except for cognitive restraint and current dieting, indicating that a number of these eating, dieting, and body concerns measures may have elements associated with depression related negative affect. The presence of reported dieting behaviour correlated well with the range of dietary restraint and disinhibition measures used in this study, but did not correlate with depression, social desirability, or weight, although there was a modest relationship with BMI. The disproportionately small number of current dieters in this study prevents clear interpretation of results using current dieting as a variable, but it appears that current dieting is possibly influenced by a range of dietary restraint concerns and disinhibited eating behaviours.

Age, body mass index, and weight were not well related to the dieting and eating measures used in this study, except for minor correlations involving BMI and weight in relation to overall chronic restraint (i.e. concern for dieting), weight fluctuation, and as already mentioned, self-reported dieting. These results in part suggested that more psychological concerns may underlay the dietary measures examined, rather than more physiological factors. Self-reported weight correlated to a moderate extent with social desirability indicating that the measures used to define BMI ( $\text{weight}/\text{Height}^2$ ) may be biased to some extent. However, the BMI itself did not correlate with social desirability.

As mentioned previously, a Principle Factor Analysis appeared a reasonable means of establishing common factors supporting the dietary restraint, disinhibition of eating, abnormal eating, and psychopathological measures used in this study. Three overall factors emerged, 1) restraint and disinhibition concerns and behaviours, 2) weight, and 3) non-restraint based loss of control over eating factor. Most of the dietary restraint and dietary disinhibition variables loaded on the first factor, indicating their potential common source. This finding fits in well with a majority of the restraint model literature, which suggests that disinhibition and restraint may form features of the same construct (e.g. Heatherton, et al, 1988). Susceptibility to hunger was the key marker variable for the third factor. This final factor suggests a potential hunger or physiological based loss of control over eating that is not necessarily related to initial restraint of eating or concerns with dieting and shape, and is orthogonal to other forms of loss of control eating partially represented by the first factor.

Although use of these factors requires caution given the poor sample size, their interpretability does extend understanding of patterns between individual dietary variables, and is in part comparable to previous factor analytical findings. For example, Laessle et al (1989) found three factors using similar variables, based on a very small sample size ( $n = 60$ ), with a principle factor which they speculated was related to underlying socio-cultural motivations to restrain eating based on drives to comply with slim body ideals. Laessle et al's principle factor also demonstrated substantial loadings by disinhibition of eating and bulimic tendencies scores, in addition to various BMI indices. A second factor found by Laessle et al. (1989) was related to weight based features and a moderate relation with overall restraint, similar to the weight factor found in the current study, but including additional loadings based on restraint. While a

hunger driven disinhibition factor was found in the current study, Laessle et al.'s last factor was more related to everyday dietary restraint unrelated to disinhibition of eating. In all, the factor structure found in the current study represents some of the elements of the research domain under investigation, especially disinhibition related restraint and weight factors.

#### Hypnotizability in relation to factors of eating, and dimensions of dietary restraint and the disinhibition of eating.

A major aim of this study was to use the factors extracted from the domain of measures to examine relationships with scores on hypnotizability and measures of dissociation. However, hypnotizability scores did not correlate with any of the factors described above, and more specifically did not correlate with either chronic restraint concerns or cognitive control of restraint, nor fears of fat and weight gain or drive for thinness. These findings do not provide support for the Socio-Hypnotic hypothesis (e.g. Groth-Marnat & Schumaker, 1990; Frasquilho & Oakley, 1997) that hypnotizability may influence the level of motivation underlying features of dietary restraint concerns and behaviours.

When statistically controlling for features such as age, BMI and weight that may affect dietary restraint factors, the specific association between hypnotizability and fears of fat/weight gain was increased in significance, but retained at best a weak and still non-significant association. Partialling out social desirability and depression did not affect these correlations. It should be mentioned that social desirability was not correlated with hypnotizability in this study, while it was the previous study (study 2, chapter 4). The implication of this is discussed later in terms of compliance approaches to hypnotizability. However, differences in selection procedures may have affected the extent to which participants expressed socially desirable response sets in general. One potential difference between study 2 and the current study was the level of participant's motivation which may have been accentuated in study 2 through the use of volunteers and paid participation, compared to this study which was conducted as part of a lab class and did not provide such payment.

### Analysis of hypnosis items in relation to factors of eating attitudes and concerns.

Hypnotic Spectrum analysis was used to address the possibility that sub-groups of hypnotic items on the HGSHS:A may differentially relate to patterns of problematic eating. This was based on the view expressed by Woody et al (1997) that easier hypnotic items are based more on waking suggestibility processes accessible to most people, while the harder items represent the functioning of less common mechanisms such as dissociation. It was hypothesised on the basis of Woody et al.'s model that the easier items would therefore be associated with general eating concerns mediated and/or moderated via waking suggestion related factors, while the harder items may be more related to disinhibition of eating that has been hypothesised as also related to dissociative type mechanisms (e.g. McManus, 1995). However, neither the easier waking suggestibility items nor the harder dissociation items were related to the general eating concerns factor or the specific disinhibition factor extracted from factor analysis detailed above.

The lack of association with the easier items, assuming that they do in fact robustly measure waking suggestibility type components and responses, goes against the Socio-Hypnotic approach that proposes that greater waking suggestibility may influence the internalisation of dietary concerns. This also goes against the findings of study 1 that supported features of the Socio-Hypnotic model in relation to restraint concerns. However, it is not necessarily the case that the easier items correspond to waking suggestibility type processes. There is a need to replicate Woody et al.s' original findings. A form of the waking suggestibility influence on eating concerns remains plausible, however, it is clear from the results of this study that hypnotic suggestibility is not the same as waking suggestibility in terms of associations with patterns of eating concerns related to dietary restraint.

Failure of the harder items to relate to the disinhibition of eating type factor indicates one of at least four possibilities, especially in terms of the items labelled as 'dissociative' in nature such as the fly hallucination and the amnesia item. These patterns of findings indicate at least three alternative possibilities. First, the harder hypnotic items and disinhibition of eating are not based on the same type of dissociative components. Second, that the harder hypnotic items are related to dissociative

processes, but disinhibition of eating is not. Third, that disinhibition of eating is related to dissociation, but the harder hypnotic items are not. A fourth possibility proposes that neither disinhibition of eating or passing harder hypnotic items were related to dissociation either in general or to specific types of dissociation.

As disinhibition related concerns was related to affective-type dissociation it seems plausible that the harder hypnotizability items may not be associated with affective dissociation. However, as level of affective dissociation was confounded with depression, affective dissociation may also not be at least directly related to disinhibition of eating. Overall, the results of the Hypnotic Spectrum Analysis places some doubt on Woody et al's (1997) two-factor model of hypnotic responding, at least in terms of a dissociative-type factor supporting responses on the harder hypnotic items.

#### Independent affects of hypnotic suggestibility on dietary restraint and disinhibition of eating.

As study 2 did find a weak and contrasting predictive affects of hypnotizability on the specific measures of restraint, regression analyses were again used in order to explore and partially replicate the potential independent affects of hypnotic suggestibility on factors such as chronic dietary restraint and cognitive control of restraint. In contrast to study 2, additional measures were included in the regressions as an attempt to further capture some of the factors related to general features of socio-cultural model of eating disorders, i.e. fears of fat and weight gain, body dissatisfaction, and depression (e.g. Stice, 1994). These additional factors have been shown as relevant to the disinhibition of restrained eating in non-clinical studies (see section 2.2.2). However, the regression analyses did not reveal any significant prediction affects of hypnotizability on either chronic concern for dieting or cognitive restraint/regulation of eating. The lack of significant predictive power for hypnotizability in relation to the different features of dietary restraint may have been due to the incorporation of variables that already account for a substantial amount of variance in dietary restraint measures, e.g. fears of fat/weight gain.

In summary, as hypnotizability did not have any significant predictive regression affect on dietary restraint factors, the role of hypnotic suggestibility as an influencing

variable on such restraint concerns continues to remain unsupported. Hypnotizability also failed to reveal any *moderating* effects on relationships between restraint concerns and other dieting concerns based on motivations to restrain, such as fear of fat and body dissatisfaction. The lack of such moderating effects suggests that hypnotizability does not appear to influence the internalisation of social pressures related to body and restraint concerns. However, there was no examination of baseline levels of perceived exposure to social pressure, which may be an important factor in determining the moderating effect of hypnotizability. In fact, hypnotizability may not moderate the variables at the level examined at in this study, i.e. fears of fat, body dissatisfaction, and dietary restraint, variables that range into the later mechanisms cited by Stice's (1994) model. Factors occurring earlier in the putative internalisation process may be more relevant to possible moderating influences of hypnotizability and general suggestibility. For example, hypnotizability may moderate the relationship between fears of fat and some social influence variables such as perceived social pressure to be thin and level of media related exposure to thin-ideals.

Before moving onto a consideration of the dissociation findings, it is worth noting that hypnotizability was moderately related to disinhibition in terms of zero-order correlations. This result remained robust after controlling for other competing variable including social desirability, depression, cognitive and affective dissociation, dietary restraints concerns, body dissatisfaction, age, weight and BMI using a regression based analysis. This result was somewhat unexpected and difficult to interpret. While this finding needs further replication it may indicate a suggestive-type process similar to that potentially demonstrated in study 1, in which body image related suggestions correlated with body anxiety. Such a relationships may, based on Heatherton and Baumeister's (1991) Escape Hypothesis lead to disinhibited eating. However, as hypnotizability was not related to body dissatisfaction itself, and there were no hypnotic suggestions relating to specific body changes in the current study, this possibility is in doubt. Hypnotizability was not related to bulimic tendencies, so the particular associations were confined to generally non-pathological measures of disinhibited eating. However, the fact remains that some elements of hypnotic suggestibility, not related to variance due to possible dissociative or social desirability factors, did predict a significant, if somewhat weak degree of disinhibition of eating. Whether this is a robust finding or a statistical artefact needs to be determined by future studies.



A final issue was the failure for hypnotic suggestibility to relate to social desirability. In terms of a Socio-Hypnotic model, components of hypnotic suggestibility and social desirability are hypothetically related to compliance. Failure of the predicted association again indicates that hypnotic suggestibility may not be supported by elements plausibly related to waking suggestibility and compliance related social pressures. This is particularly problematic as study 2 did find support for a relationship between hypnotic responding and social desirability. The failure of the current study to replicate some of the findings of study 2, is further discussed below. The hypnotizability scale also failed to correlate with either cognitive or affective dissociation a finding similar to study 2, again implying that hypnotic suggestibility is not related to the types of dissociation examined here.

#### Disinhibition of eating, types of dissociation, and the confound of depression.

A second major concern of this study was the examination of different types of dissociation in relation the measures of pathological and non-pathological dietary restraint, eating, and body concerns. However, the predicted correlations with bulimic tendencies and disinhibition of eating were not found. In fact, taking into account the number of correlations conducted, no significant correlations emerged between cognitive dissociation and any of the eating attitude or restraint factors measured in this study.

Stronger correlations were found between affective dissociation, as measured by the PAS, and a range of dietary restraint and disinhibition of eating measures. The strongest of these were with depression, disinhibition of eating, bulimic tendencies, and measures related to direct concerns about dieting and body shape. These correlations were summed up by moderate, yet highly significant correlations with the loss of control over eating and the restraint and disinhibition factors extracted in the previous factor analysis procedure. However, given the correlational basis of these findings, interpretation should be treated with caution. None-the-less, at very least there appears to be some relationship between general affective dissociation and a wide range of eating and dietary restraint based measures and these findings suggest a number of significant possibilities.

Examination of dissociation sub-scales revealed that for the DES II absorption factors, including the non-pathological absorption and imagination sub-scale, were weakly associated with a number of the restraint and eating concerns measures, but all were not sufficiently significant to be used for interpretation. In terms of sub-scales of affective dissociation, the modification of control factor was significantly related to all the restraint and eating measures used in this study. Stronger correlations were found with measures relating to heightened concerns with dieting and body dissatisfaction, fears related to becoming fat, disinhibition of eating, and negative affect. All these features are related to a Dissociative Escape interpretation of the role of affective dissociation. Moderate to good correlations with the loss of control over eating, and the restraint and disinhibition factors derived from the previous factor analysis; support the overall pattern of correlations with individual measures.

However, as mentioned briefly above, a serious concern in this study was related to the correlations involving the two types of dissociation and depression. Partialling out depression led to a substantial reduction in the magnitude of correlations involving both cognitive and affective dissociation measures. The overall cognitive dissociation measure failed to correlate with any other measure. Weak correlations remained between overall affective dissociation and the RRS, a measure of chronic dieting concerns and weight fluctuation, potentially indicating that a feature of chronicity is important in the expression of affective dissociation in relation to dietary restraint concerns. The modification of control factor of the PAS remained moderately, but significantly, correlated with the overall Revised Restraint Scale and specifically its concern for dieting sub-scale. These partial correlations continue to support a potential influence of affective based dissociative experiences that may act either as a defence against negative affective cognitions, or as a facilitator in loss of emotional control that may leave individuals open to loss of control over eating. However, even after disattenuating these correlations, the levels of association remained weak at best and as disinhibition of eating did not remain correlated with affective dissociation it is unlikely that such a form of dissociation directly regulates potential features of disinhibited eating.

Regression models conducted to examine the predictive effects of the dissociation variables on disinhibition of eating, a relationship predicted by the Dissociative Escape Hypothesis (McManus, 1995), found no significant prediction effects for either cognitive or affective dissociation. However, unexpected regression coefficients emerged for cognitive dissociation as a weak, yet significant predictor for cognitive restraint when controlling for concern for dieting, whilst affective dissociation weakly, but significantly, predicted concern for dieting when cognitive restraint was controlled for. These contrasting predictive effects occurred when variables such as depression, social desirability, body dissatisfaction, and weight fluctuation, were statistically controlled for. These results suggest that different types of dissociation may weakly promote features of dietary restraint, but they are specific features related exclusively to either conscious control over restraint or chronic restraint concerns, but not both. The lack of control and regulation of certain features of affect, due for example to dissociative non-integration, may lead to increased tendencies to experience affective reactions that promote chronic concerns for dieting that do not involve conscious cognitive control of eating. In terms of cognitive restraint in the potential absence of previous chronic restraint concerns, factors underlying cognitive dissociation may help separate thoughts about food and eating from ones self-awareness, and in this sense promote more efficient control over eating which may lead to less disinhibitory reactions. So whilst the initial interpretation of the Dissociative Escape Hypothesis does not appear to be supported, its basic assumptions can be used to interpret these findings. An alternative explanation is that the dissociation scales are picking up features of general pathology unrelated to dissociation in general. Regressions examining if types of dissociation acted as moderators of relationships between restraint and disinhibition of eating also revealed no predictive effects.

Before going on to discuss reasons why this study failed to replicate the findings of study 2, some mention should be made of the mean level of DES scores found in the current study. The DES II means in this study appeared as elevated as those in the previous study. However, they have maintained a very close similarity with those in study 2 and the issues discussed at the end of that study apply to these findings. The low level of means found for the sub-scales of the EDI indicates indicate that in terms of eating disorders at least, this sample does not represent a clinical group. The level of depression suggested, on average, a non-depressed sample, and again suggested that the

sample was not seriously or even moderately depressed in relation to expected norms on the Beck's Depression Inventory. Similar to study 2, the population in this group were relatively young (mean age = 19.68, SD 2.56, range 18-27), which is again a factor supporting the possible higher DES II means found in this study.

#### Failure to replicate study 2.

It has been pointed out earlier that this study has not only failed to replicate some of the findings of study 2, but, as in the case of hypnotizability and disinhibition of eating, the predicted associations have been reversed. An initial possibility for difference in findings comes from the setting and how it interacts with participants' motivations. In this study the participants were not self-selected, i.e. they were not volunteers answering adverts for participation. The participants' motivation to comply, for example, may be reduced for that reason. The lack of monetary incentive may have moderated motivation in similar ways. Reduction in motivation to participate may have led to less feeling for the need to comply with experimental demands, compared to study 2 and study 1. The lack of significant relationships involving the social desirability scale supports this possibility, as do the lower means levels of hypnotic suggestibility in this study compared to study 2. Motivation may have been reduced further by setting the testing sessions in an introductory lab class which involved a number of other studies being run concurrent with this one, hence the possibility of fatigue factors may have created increased measurement error and noise.

The testing of hypnotizability in large groups in this study may have also created contextual differences that altered the findings between study 2, potentially by further decreasing motivation to respond in compliance related manner. It can be argued, however, a greater number of co-participants may increase social pressure to comply, but it may be more plausible that potential anonymity may be increased when the ratio between experimenters and participants is decreased. It is also possible that, given the lower attrition rate for hypnotizability compared to study 3, these results may reflect a more accurate distribution of hypnotic suggestibility scores and hence be more accurate in the overall findings.

None of the above factors explicitly explain how certain relationships became inverted, such as with hypnotizability and disinhibition of eating or the relationships with the dissociation scales and the restraint measures. It is possible that once compliance type affects have been reduced, then other components of hypnotic suggestion may remain which may be related to control and disinhibition factors, however, what these may be remains unclear. They are unlikely to be related to the forms of dissociation examined in this and previous study, as the inverted relationship remained after accounting for cognitive and affective dissociation.

## Chapter 6

### **Study 4: Response latencies of restrained and non-restrained eaters to shape- and food- related words: An examination of relationships with dissociation and hypnotizability.**

#### **Chapter Overview.**

In this final study a different approach to examining body shape and dieting concerns is adopted, based on Stroop methodology (Stroop, 1935). An attempt to replicate previous findings of increased latencies in restrained eaters to food and body shape words is combined with an investigation of the relationships between such latencies, hypnotizability, and the different kinds of dissociation measured throughout this thesis.

#### **6.1. Introduction to study 4.**

This final empirical chapter adopted a Stroop paradigm to examine if cognitive features of dietary concerns are related to hypnotic suggestibility and types of dissociative experiences. Study 2 and study 3 have not supported the Socio-Hypnotic hypothesis of dietary restraint, which states that components of hypnotic suggestibility are related to the internalisation of dietary restraint concerns. However, it is still possible that hypnotic suggestibility may be related to specific cognitive features that may underlie dietary restraint concerns; especially factors based on the internalisation of body shape and food concerns. Self-report measures of dietary concerns used in studies 2 and 3 may not have specifically identified such internalised cognitive factors. Stroop methodology can also examine affective related reactions to specific word content. For example, it can help identify if higher negative food and body shape/weight concerns may be related to higher affective and/or cognitive dissociation based on the measures of dissociation used throughout this thesis. This hypothesis was predicted by McManus' (1994) Dissociative Escape model in which certain predisposed individuals may experience dissociative reactions to aversive self-realizations that allow them to escape from the impact of the self-realisation.

Before examining the issues revolving around the Socio-Hypnotic hypothesis and the Dissociative Escape model, it was considered important to assess if cognitive dimensions of body shape and food concerns differentiated levels and types of non-clinical dietary restraint and non-restraint. In other words, the Stroop approach to dietary restraint can help assess if the restraint scales used in this thesis, i.e. the cognitive restraint scale (Stunkard & Messick, 1985) and the Revised Restraint Scale (Herman & Polivy, 1980), are related to the expression of actual cognitive reactions to body shape/weight and food stimuli. This provided a background in which interpret findings related to hypnotic suggestibility and dissociative processes.

#### Background to Study 4.

Self-report measures have been used throughout this thesis to examine the issues of dietary restraint, dietary disinhibition, hypnotizability, and various types of dissociation. Many of these measures, with the possible exclusion of the hypnotizability scale, tend to be wholly based on pencil-and-paper procedures and do not strictly represent direct behavioural or cognitive tests of potential constructs. Stroop methodologies generally consist of presenting a meaningful stimulus word in a particular ink colour and recording the time taken to correctly identify, or name, the ink colour. Words with particularly salient or personal meanings to certain individuals have been shown to interfere with ink colour naming. The original Stroop studies (Stroop, 1935) used colour names as stimuli. The first Stroop effect found that words printed in incongruous ink (i.e. when the word 'RED' was printed in green ink) took longer to name than when they were presented in congruous inks ('RED' printed in red ink). For over a decade researchers have adapted the Stroop paradigm to examine stimulus words with significant affective salience to groups with particular clinical diagnosis (e.g. Williams, Mathews, & MacLeod, 1996).

The Stroop paradigm has been used with eating disordered populations to examine the colour naming latencies for food and body size related words, as food and body size concerns appear to form a substantial clinical feature of these populations. One initial finding by Channon, Hemsley, and Padmal de Silva (1988) was that anorexics were significantly slower than non-clinical controls in naming food words compared to neutral words. However, Channon et al.s' non-clinical controls were also significantly slower in naming food words than control words, but to a lesser

magnitude. Fairburn, Cooper, Cooper, McKenna, and Anastasiades (1991) found similar results in a sample of bulimia nervosa patients, using food and body shape words, but also found pathology related latencies for weight and eating words. However, these preliminary studies suffered methodological flaws, especially a failure to counterbalance the exposure of the target emotional stimuli in relation to their respective control stimuli. Cooper, Anastasiades, and Fairburn (1992) replicated Fairburn et al.'s (1991) study using a counter-balanced design to reduce possible order and fatigue effects. Cooper and Fairburn (1992) further replicated these results finding that bulimia nervosa and anorexia nervosa patients exhibited longer colour naming latencies than non-clinical weight loss dieters and non-dieters. However, a further finding by Cooper and Fairburn (1992) was that non-clinical weight loss dieters with previous or current partial symptoms of eating disorders also showed significant latencies compared to the other non-clinical groups. In combination, these findings suggest that the presence of eating disorder related symptoms may be sufficient to produce significant latencies with food and body size related words in a Stroop paradigm without the need for a full diagnosis of eating disorders.

It is important to note that the studies mentioned above have continued to be criticised for particular methodological flaws (e.g. Lovell, Williams, & Hill, 1997). Key flaws include combining disparate target words relating to food, shape, weight, and eating words on a single stimulus card (e.g. Fairburn et al, 1991; Cooper, et al. 1992; Cooper, and Fairburn, 1992), and failing to counterbalance the presentation of Stroop stimuli. They are also at fault in using target words from the same semantic category while failing to use control words from the same semantic category, a factor which may decrease naming times for control words, but increase them for target words (e.g. Warren, 1972). Another frequent flaw is the presentation of self-report questionnaire measures immediately before Stroop testing (e.g. Cooper et al, 1992, Cooper and Fairburn, 1992), a procedure that may prime and elevate or otherwise interfere with responses on the Stroop task, especially for eating disordered individuals who may have cognitive schemata highly attuned to such stimuli. Lovell, Williams, and Hill (1997) corrected many of these shortcomings in a study using individuals with anorexia nervosa, bulimia nervosa and non-clinical recovered individuals from both diagnostic categories, in addition to a non-clinical group of individuals with no history of eating disorders. The findings indicated that currently bulimic individuals and recovered anorexics showed longer latencies on body shape related words than recovered bulimics



and the control individuals. There were no apparent differences, due to diagnostic classifications, on the colour naming of food words, but there was a significant main effect of food versus control words, with food words generating higher latencies in all individuals, suggesting a general overall concern with food found across the women in this sample. Lovell et al (1997) found no differences between the currently dieting and non-dieting non-clinical sample for either food or shape words.

The studies listed above have found that non-clinical dieting individuals without previous or current eating disorder symptoms tend not to express an 'Eating Stroop' affect for body shape, food, eating, and weight words. However, more importantly for the current study, the 'Eating Stroop' has been used to examine responses latencies in *restrained* and *non-restrained* eaters rather than current weight loss dieters. As Lowe et al (1991; Lowe, 1993; Lowe, 1995) have suggested, the behavioural reactions of restrained eaters and current weight loss dieters are not equivalent, at least in terms of disinhibition affects. Using the Dutch Eating Behaviour Questionnaire (DEBQ: van Strein et al, 1986) to classify low, medium, and high restrainers, Green and Rogers (1993) found that both high restrainers, and current dieters, had significantly longer colour naming latencies, in relation to control words, on separate computer presented blocks of the food and body shape words compared to low and medium restrainers. The finding that dieters were also delayed on food and body shape words goes counter to previous studies, and may be a feature of the computer presentation of the words, but may also be that Green and Rogers (1993) only analysed relatively non-habituated stimuli. Previous studies have tended to use long lists of stimulus words where habituation may led to decreased latencies over time, despite initially delayed responding.

Perpiñá, Helmsley, Treasure, and Padmal de Silva (1993) used the Revised Restraint Scale (RRS: Herman and Polivy, 1980) and the Drive for Thinness scale of the Eating Disorders Inventory (EDI: Garner, Olmstead, and Polivy, 1983) to categorise high and low restrainers in order to examine eating Stroop interference. Their findings indicated that individuals high on restraint and drive for thinness, in contrast to individuals low on restraint and drive for thinness, share longer latencies on shape and food related words, compared to neutral words. However, Perpiñá et al. (1993) used a dimensional approach to the restraint and thinness measures which also incorporated eating disordered individuals rather than a purely non-clinical group of participants.

The current study sets out to examine whether different types of restraint categorisation, such as chronic restraint concerns, cognitive restraint, and drive for thinness, lead to significant differences in colour naming for food and body shape related words. Previous studies have not examined exclusively non-clinical populations using these specific measures of restraint, and the widely used criteria of dieting to lose weight cannot be applied with certainty as a definition of restrained eating. Hypothesising that the underlying process for prolonged latencies of food and shape words relates to repeated thoughts and concerns about these factors; non-clinical individuals with accentuated dieting concerns should demonstrate such colour naming latencies. Higher scores on the concern for dieting and cognitive restraint measures used throughout this thesis, and the more pathological drive for thinness scale, imply a pre-occupation with monitoring and restricting food intake, restrainers defined by these scales may demonstrate increased food and body shape colour naming latencies. However, it is important to address whether an individual has presented with a current or previous history of eating disordered symptoms, as such individuals may bias the outcome measures. No previous non-clinical study reviewed in this chapter has explicitly addressed this question.

A more central concern of this study was the use of the eating Stroop as a relatively unbiased, in terms of social desirability, behavioural measure of eating and body concerns. In addition to being a more direct assessment of such concerns, the eating Stroop focuses on possible cognitive components or structures underlying the potential formation of such concerns. Latencies on Stroop words may therefore act as good candidates for use in correlations with other measures of interest, such as hypnotizability and types of dissociation. Previous studies in this thesis have generally failed to find a correlation between hypnotizability and various measures of restraint. However, the use of Stroop latencies can examine if hypnotizability is related to underlying cognitive dimensions related to the internalised pressures putatively related to a repeated focus on food and body shape hypothesised to cause the Eating Stroop effect.

The presentation of the eating Stroop may also constitute presentation of potential aversive self-statements relating to undesirable body shape and uncontrolled eating or at very least statements relating to an aversive possible self. Previous studies

(e.g. Lovell, et al. 1997) provide anecdotal evidence that the eating Stroop when used on current anorexics and bulimics can cause moderate levels of distress. These affective reactions relate well to the aversive affect of such words on individuals with heightened concerns for eating and body shape. The aversive reactions to the 'eating Stroop' can be framed in terms of Heatherton and Baumeister's (1991) Escape Hypothesis, and the Dissociative Escape Hypothesis outlined in this thesis and elsewhere (McManus, 1995). Individuals who escape from aversive self-cognitions may also potentially express related defence behaviours, especially dissociative type experiences. The potential results of such defences are complex. One hypothesis is that higher level attention may be required to dis-attend to the meaning of the word, while trying to respond to the ink colour as quickly as possible, and hence shifting to a lower level of awareness will increase responses. However, this dis-attentional process would only be relevant if the meaning of the word interfered with responding, therefore, dissociative defence against the meaning of the word may in fact increase colour-naming speed. Yet another hypothesis is that affective-laden words may absorb attention, preventing quick responses to such words. Correlational analyses of the dissociation scale in relation to the Stroop colour naming may reveal indications of the potential relevance, if any, of dissociation to the concerns food and body presented in this paradigm.

Certain additional methodological features have been incorporated into this study, such as the use of control words taken from the same semantic categories (e.g. Lovell, et al, 1997) as similar semantic words may increase Stroop interference (e.g. Warren, 1972). Another feature of this study was the randomisation of the presentation order of target and control words and to prevent any order effects from interfering with potential findings. Rather than present blocks of target or control words on cards, the target and control words, were individually randomised across presentations, so that the words presented were randomly selected from the different categories. Green and Rogers (1993) also suggest that habituation effects may impair the effects of semantic interference over time. Randomisation of word presentation in the current study may help prevent habituation problems reducing the chance that similar category words follow each other.

## 6.2.Methods.

### Participants.

The initial sample consisted of 57 female first year psychology undergraduates taking part in a lab class on individual differences. All participants had English as their first language. However, participants were excluded from further analyses if they were aged over 30, had a BMI of over 30 or under 16, and/or had reported a previous or current eating disorder diagnosis or had or were receiving a medical or psychological treatment for an eating disorder. Three participants were excluded on the basis of BMI, and a further 4 were excluded due to previous or current medical/psychological eating difficulties. The mean age for the final sample was 19.43 (SD 1.96), with a mean BMI of 21.17 (SD 2.36).

### Materials and Apparatus.

All the measure used in this study, except the Stroop stimuli, have been used in previous studies reported within this thesis. For details of norms and reliabilities please refer to the sections indicated within the description of each measure, or refer to the Methods section of chapter 5 (5.2).

*Stroop stimuli:* Four lists of Stroop words were constructed. Each list contained 9 words. Two separate lists contained target words related to food and shape. Two control lists pertaining to clothes (shape control) and travel (food) were used. Control words were matched as close as possible to target words, on a one to one basis, for word length and word written frequency based on norms from either Kucera & Francis 1967 or 1982 dependent on the categories used by the original researchers. The target words for body shape were: FATTENING HIPS WEIGHING CHUBBY STOMACH THIGHS PLUMP FATTY SLIM. Control words for body features were based on travel: TRAVELLERS INN PILGRIMAGE CRUISING CARAVAN PASSPORT AIRPORTS JOURNEY POSTCARD. A majority of these words were previous used by Lovell et al (1997) in their study, and adopt 1967 word frequencies. Target words for food were GATEUX CRISPS SWEETS CHIPS CHOCOLATE PIES TART DESSERT CREAM, while food control words were based on clothes: TOWELS SHORTS OUTFIT SKIRT TROUSERS LACE GOWN BOOTS GLOVE. These words where used by Green, et al

(1994) and rely on 1982 word frequency norms. Each word was coloured ten times in blue, green, or red hue and presented randomly on a DELL 15 inch Trinitron Monitor. A Dell 'Dimension P901' 32X computer was used to generate and present the stimuli. Participants colour responses were logged using a standard DELL 'QWERTY' keyboard with specific coloured keys used to represent colour responses. Response times were stored using the DELL computer<sup>1</sup>.

### Questionnaire Measures.

*Dietary and participant demographics questionnaire.* This was the same demographic measure used throughout this thesis. It measured age, desire to be thinner, desire to be larger, current dieting status, history of dieting, perceived culturally attractive body shape, and previous/current medical or clinical eating disorders. Self-reported body weight and height were also recorded on this questionnaire as in study 3 (section 5.2).

*Harvard Group Scale of Hypnotic Susceptibility: Form A. (HGSHS:A).* The same measure of hypnotizability was used in this study as in previous studies in this thesis. The scale is based on 12 test suggestions scored in a dichotomous pass/fail format. Total scores are the sum of passed suggestions. Higher scores indicate higher hypnotizability, ranging from 0 to 12. For details of means and reliabilities see study 2 (see section 4.2 or section 2.5). The same audio-taped presentation of the HGSHS:A was used as in study 2 and study 3, with a Sony 'Cassette-Corder' Model TCM-919 used for playback. Participant's responses to suggestion were recorded using the HGSHS:A response booklet.

*The Three Factor Eating questionnaire (TFEQ).* The cognitive restraint, disinhibition of eating, and susceptibility to hunger scales of the three factor eating questionnaire were used in this study. Higher scores on these scales indicate greater levels of the specific factor. Please refer to previous studies (e.g. study 1, section 3.2) for further details including means and reliabilities.

*Revised Restraint Scale (RRS).* The same version of the RRS used in study 3 was used in this study. The RRS contains items related to concern with dieting and weight

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<sup>1</sup> The author would like to thank Chris Tomlinson for constructing the program used to present the stimuli. The program used in this study was based on a program used in previous research at UCL.

fluctuation that form the basis of separate sub-scales. Again higher scores are related to greater levels of a particular factor. The concern with dieting sub-scale used the original variable format presented by Herman and Polivy (1980).

*Eating Disorders Inventory (EDI) abnormal eating scales.* The Drive for Thinness, Body Dissatisfaction, and Bulimia sub-scales of the EDI used in study 3 (see section 5.2) were used in this study. Again, higher scores for these measures indicate greater levels of the respective construct.

*Becks Depression Inventory (BDI):* The BDI was also used in this study and was identical to the measure used in study 3. Higher scores indicate higher levels of depression.

*Marlowe-Crowne Social Desirability Scale (SDS).* In this study the SDS was again used as an indicator of socially desirable responding with higher scores indicating greater tendencies to give responses perceived as more socially acceptable.

*Measures of dissociation.* Cognitive dissociation and affective dissociation were measured using the same scales utilised throughout this thesis, the DES II and PAS, respectively. Sub-scale scores for the DES II absorption, depersonalisation/de-realisation, amnesia, pathological taxon, and non-pathological taxon were also derived as in previous studies. As were the PAS modification of affect, control, and cognition sub-scales.

## Design and Procedures

The experiment consisted of a 2 x 2 mixed design, with restraint status, based on either cognitive restraint or concern for dieting, as a between subject variable and target word type (shape or food) as a within subjects measure. Restraint status was defined using a median split on either the cognitive restraint, concern for dieting, or drive for thinness measures. The experimenter was blind to the restraint status of the participants. The dependent variable was the total time taken in milliseconds to respond to words within a specific word category, from which was derived an index of target word response times (i.e. food or shape) based on subtracting overall time for completion of respective control list words from target list times. Word order was partially randomised across

word categories and between participants, insuring that the same word in the same colour did not appear immediately after itself. Questionnaire measures were administered after Stroop testing. Errors in colour naming were repeated at the end of the complete trial of all the stimuli words. Unfortunately, error rates were not recorded due to a computer based error.

Participants were recruited from a previous lab class on individual differences conducted at the UCL Psychology Department that formed the basis for a sub-sample of scores for study 3. Hypnotizability scores were collected from the lab class based using procedures detailed in study 3 (section 5.2). Stroop testing was conducted after initial hypnotizability testing on the same day as the hypnotizability session. Individual computer cubicles at the UCL psychology department were used for the Stroop task. Participants were told that this was a computer based test examining reaction times to specific types of everyday words, including words about travel, food, and body parts, which would be followed by a set of general personality questionnaires. The preceding individual differences class did not mention aspects of dietary restraint or related factors, so this was the first mention of food and body issues. The experimenter informed participants that they were not obliged to take part in this study and that they could refuse participation at any time without giving a reason. All participants agreed to take part and completed the procedures indicated above.

If participants agreed to take part then they were instructed that individual words coloured in red, green, or blue, would be presented on a computer screen in front of them. They were to key in the colour of each word as quickly as possible using one of the coloured keyboard keys. In addition, stickers in the formation of the keyboard keys were placed below the monitor screen as a reference for keying in colour choices. Any errors in colour naming would be indicated by a loud beep. A practice trial of ten words was used to familiarise participants to the task. In the experimental trials each word appeared in capitals in the centre of a black computer screen, and remained there for 5 seconds or until the participant made a response. Each stimulus word appeared 30 times, 5 times in each of the particular colours (red, blue, green). There were a total of 540 presentations. The task took about seven minutes to complete. To avoid possible effects of priming on questionnaire responses the main questionnaire measures were administered a week later in a group feedback session for the individual differences

laboratory class. Participants were de-briefed as to the nature of the experimental task and the nature of Stroop procedures after they completed the questionnaires.

### Statistical analyses.

Statistical Package for the Social Sciences (SPSS, version 9) was used to analyse the data, for accuracy of data entry, distribution characteristics and general statistical procedures. MANOVAs were used to examine differences between groups of restrainers and non-restrainers based on Stroop colour naming latencies for indices of food and body shape related words. Univariate ANOVAs were used to examine differences between each of the dependent variables in turn. Correlational analyses using Pearson's product moment were conducted between the food and shape word colour naming latencies, indices of food and shape latencies, and the questionnaire measures used in this study.

## **6.3. Results.**

### 6.3.1 Data distributions and data cleaning.

Prior to analysis the following measures were examined for accuracy of data entry and general distribution characteristics: concern with dieting (RRS), cognitive restraint (TFEQ), Fears of fat/weight gain (GFFS), Revised restraint scale total score (RRS), drive for thinness (EDI), body dissatisfaction (EDI), bulimic tendencies (EDI), depression (BDI), disinhibition of eating (TFEQ), susceptibility to hunger (TFEQ), weight fluctuation (RRS), social desirability (SDS), cognitive dissociation (DES II), and affective dissociation (PAS). All variables had means in the possible ranges and had reasonable standard deviations (means, standard deviations, and reliabilities are listed in table 6.1). In addition to skewed distributions for cognitive and affect dissociation, which were resolved using square root transformations, four variables had unacceptable skew. These variables were fears of fat (skew  $z = 3.30$ , kurtosis  $z = 1.02$ ), drive for thinness (skew  $z = 4.37$ , kurtosis  $z = 2.11$ ), bulimic tendencies (skew  $z = 7.31$ , kurtosis  $z = 10.06$ ), and depression (skew  $z = 4.51$ , kurtosis  $z = 2.79$ ).

The poorly distributed variables were examined for outliers, but none were found. Square-root transformations improved the distribution characteristics for three



variables (fear of fat, skew  $z= 2.31$ , kurtosis  $z= 0.38$ ; drive for thinness skew  $z = 1.85$ , kurtosis  $z = 1.16$ ; depression skew  $z= 0.86$ , kurtosis  $z= 0.71$ ). Bulimic tendencies required a logarithmic transformation to improve distribution properties (skew  $z = 0.94$ , kurtosis = 0.69). Missing data on variables was fairly low (under 5%) and were replaced by serial means in order to maintain a reasonable sample size for subsequent analyses.

**Table 6.1.**  
**Means, and reliabilities for variables in study 4.**

	Means (SD)	Cronbach's $\alpha$	Transformations required
<b><u>Dietary restraint measures.</u></b>			
Concern over dieting (RRS)	7.84 (4.73)	.90	None
Cognitive restraint (TFEQ),	7.05 (5.27)	.90	None
Fear of fat and weight gain (GFFS),	18.97 (7.34)	.92	Square-root
Revised Restraint Scale (RRS).	13.12 (7.55)	.89	None
<b><u>Pathological Measures.</u></b>			
Drive for thinness (EDI)	4.04 (5.77)	.92	None
Body dissatisfaction (EDI)	11.13 (8.95)	.95	None
Bulimic tendencies (EDI),	2.11 (3.90)	.92	Logarithmic
Depression (BDI)	7.36 (6.41)	*	Square-root
<b><u>Dietary disinhibition measures.</u></b>			
Disinhibition of eating (TFEQ)	7.85 (3.69)	.81	None
Susceptibility to hunger (TFEQ),	6.74 (2.99)	.76	None
Weight Fluctuation (RRS)	5.28 (3.89)	.78	None
<b><u>Dissociation measures.</u></b>			
Cognitive dissociation (DES II)	16.96 (10.29)	.90	Square-root
Affective dissociation (PAS)	47.30 (9.84)	.89	Square-root
<b>Hypnotizability (HGSHS: A)</b>	6.81 (2.37)	.68	None
<b>Social desirability (SDS).</b>	12.07 (4.73)	*	None

\*reliability statistics not available for this scale.

All measure appeared to be within reasonable ranges, and the DES means were lower than in previous studies, closer to previous findings for this age and gender group (mean age = 15.6, SD 12.1: Ross et al, 1990). The eating disorder inventory variables were all within previous ranges for non-clinical samples (Garner, 1991).

### Body and food colour naming latencies.

Examination of the Stroop colour naming latencies indicated that food, shape, and control category words were all adequately distributed, and did not require transformation. The means and reliabilities of these latency measures are listed in table 6.2. below. The sets of colour naming words demonstrated good to excellent internal consistency, as would be expected given their close semantic relationships and the similarity of the administration procedures.

**Table 6.2.**

**Means and reliabilities for colour naming latencies for word categories in study 4.**

	Means (SD)	Cronbach's $\alpha$	Transformations required
Food Latencies	528.71 (112.95)	.90	None
Shape Latencies	538.88 (116.20)	.88	None
Travel latencies (food control)	528.75 (109.35)	.89	None
Clothes Latencies (Shape control)	519.00 (100)	.87	None

### 6.3.2. Participant and dietary demographics.

A significantly large proportion of participants were not currently dieting to lose weight (72%, 36/50,  $\chi^2 = 9.68$ ,  $p < 0.05$ ) average duration of current dieting was 25 weeks (SD 25.14) showing a wide dispersion of durations. However, a significant majority had previous gone on a diet (66%, 33/50,  $\chi^2 = 5.12$ ,  $p < 0.05$ ), with average age of first diet being 14.48 (SD 4.36). A majority of individuals desired to be slimmer (68%, 34/50,  $\chi^2 = 24.08$ ), whilst only a very small minority of participants wanted to be larger (1%,  $\chi^2 = 32.00$ ,  $p < 0.05$ ). In terms of culturally perceived attractive body size, a majority of individuals considered a slim body to be attractive (82%, 41/50) compared with medium (14%, 7/50), whilst none endorsed a large body size as culturally attractive. Chi-squared tests on cultural attractive body size indicated a significant difference between the proportion of participants indicated above ( $\chi^2 = 24.08$ ,  $p < 0.001$ ). These demographics indicate that while there are significant desires to be slimmer, which appeared to be recognised as a tendency in relation with social considerations of attractive body size, few people reported actually dieting to achieve that aim.

### 6.3.3. ANOVAs for colour naming latencies based on restraint groupings.

Group means for colour naming latencies by category and restraint are indicated in table 6.3. Median split procedures identical to those used in study 1 were used to define restraint groupings, with participant scores falling on the median value excluded. In terms of drive for thinness, a median slit produced very few participants overall ( $n = 5$ ) as a majority of participants scored 0 due to EDI scoring procedures. To ameliorate small  $n$  issues an alternate scoring procedures based on a 1 to 6 scoring scheme (for more details see: Hart & Ollendick, 1985; Thompson, Berg, Shatford, 1987), rather than a 0-3 scoring scheme was used to calculate median split.

Concern for dieting restrainers appeared to demonstrate increased latencies for naming words from all categories, including control words, compared to non-restrainers. However, these differences appeared to be small, especially when examining change indices for food words, while shape indices suggested slightly longer delays for restrainers than non-restrainers. Cognitive restraint based restrainers appeared to show some minor differences in latencies for shape and food words compared to controls, although change indices reveal small differences between groups. As for the other restraint groupings, drive for thinness restrainers appeared to demonstrate little differences between target and control words, while non-restrainers appeared to exhibit slightly longer latencies when examining the food index.

**Table 6.3.**

**Means and standard deviations (in milliseconds) for body shape and food colour naming latencies in relation to different restraint types.**

	Concern for dieting		Cognitive restraint		Drive for thinness	
	Restrainers	Non-restrainers	Restrainers	Non-restrainers	Restrainers	Non-Restrainers
Food	556.1 (122.11)	499.00 (95.9)	552.55 (135.01)	516.45 (89.23)	551.99 (138.86)	525.37 (91.71)
Travel (food control)	557.7 (121.00)	497.40 (87.00)	556.83 (131.80)	508.46 (90.70)	555.75 (135.63)	514.62 (88.54)
Shape	570 (128.00)	504.63 (91.43)	559.70 (131.00)	516.63 (97.76)	525.37 (91.71)	528.92 (104.49)
Clothes (shape control)	537.24 (104.03)	499.60 (94.36)	536.23 (115.03)	506.53 (91.30)	535.10 (117.92)	515.02 (92.96)
Food index (target control)	-1.57 (57.3)	1.62 (55.15)	23.47 (48.09)	7.96 (58.26)	3.76 (53.7)	10.75 (59.16)
Shape Index (target control)	33.24 (52.73)	4.97 (62.4)	23.47 (48.09)	10.10 (69.94)	23.55 (49.66)	13.90 (14.00)
<b>n</b>	24	26	24	20	24	20

The change indexes, calculated for the differences between target and control words, formed the dependent variables for separate MANOVA based food/body shape indices. The different restraint groups, based on the median split procedure detailed above, formed the basis for the separate between group MANOVAs. Type III sums of squares for the GLM (General Linear Model) ANOVA were used in these analyses, as these are most appropriate for use with unequal cell sizes. The MANOVA based on the concern for dieting groups did not produce a significant difference between restrainers and non-restrainers (Wilk's Lambda = 0.94,  $p > 0.05$ ) on the basis of a composite food/body change index, and univariate ANOVA's indicated no significant differences between restrainers and non-restrainers for either food ( $F_{1, 48} < 1$ ) or shape ( $F_{1, 48} = 3.00$ ,  $p > 0.05$ ) indices. A similar result emerged when the cognitive restraint groupings were examined, with no significant effect of restraint status on the composite food/body change index (Wilks Lambda = 0.97,  $p > 0.05$ ), whilst univariate tests again showed no group differences for food or shape change indices ( $F_{1, 48} < 1$  for both variables). Finally, drive for thinness groups also failed to present with significant differences for either the multivariate F (Wilks Lambda = 0.97,  $p > 0.05$ ), or the univariate ANOVAs ( $F_{1, 48} < 1$  for both food and shape indices). Using age, BMI, weight, and depression as covariates in the above analyses did not alter these findings.

#### 6.3.4. Correlations between colour latencies for food/body shape words, and general measures of dietary restraint and disinhibition.

The correlations between colour naming latencies for the shape, food, and related indices are illustrated below in table 6.4.. Correlations involving hypnotizability and the dissociation measures were based on a Bonferroni corrected  $\alpha$  of 0.012, for each of the Stroop measures. All other correlations are based on an overall Bonferroni  $\alpha$  of 0.001.

**Table 6.4.**

**Correlations between dietary restraint, dietary disinhibition, and the colour naming latencies for food and shape Stroop words.**

	Food Words	Shape Words	Food Index	Body Shape Index
<b><u>Dietary restraint measures.</u></b>				
Concern for dieting (RRS)	.29*	.31*	-.02	.17
Cognitive restraint (TFEQ),	.30*	.29*	.04	.08
Fear of fat and weight gain (sq GFFS),	.11	.09	.03	.01
Revised Restraint Scale (RRS).	.31*	.30*	.07	.18
<b><u>Pathological Measures.</u></b>				
Drive for thinness (EDI)	.08	.10	-.02	.1
Body dissatisfaction (EDI)	.17	.06	.09	-.12
Bulimic tendencies (sq EDI),	.14	.20	-.03	.19
Depression (sq BDI)	.06	.04	.01	-.07
<b><u>Dietary disinhibition measures.</u></b>				
Disinhibition of eating (TFEQ)	.17	.16	.10	.05
Susceptibility to hunger (TFEQ),	.03	.01	.02	-.09
Weight Fluctuation (RRS)	.25	.20	.17	.13
<b>Social desirability (SDS).</b>	-.11	-.09	-.09	.01
<b><u>Dissociation measures.</u></b>				
Cognitive dissociation (sq DES II)	.24*	.09	.18	-.26*
Affective dissociation (sq PAS)	.01	-.08	.04	-.08
<b>Hypnotizability</b>	-.13	-.18	.05	-.02

\*p < 0.05, 2-tailed.

Overall Bonferroni corrected alpha = 0.003.

Bonferroni alpha for hypnotizability and dissociation measures = 0.001

Transformations: sq= square-root, log. = logarithmic.

It is clear that the Stroop data does not correlate significantly with any of the measures of dietary restraint, dietary disinhibition, or other related features such as depression. More importantly, in relation to the study hypotheses, hypnotizability did not relate to any of the raw Stroop derived food or shape concern measures, and neither did, cognitive dissociation, nor affective dissociation. Controlling for neutral word latencies instead of direct naming latencies, i.e. adopting the index scores, did not obtain significant correlations were obtained. Partialling out age, weight, and BMI did not affect the significance of the above correlations. Partialling out social desirability, and depression only had the effect of reducing the correlations between cognitive dissociation, the food words ( $r = 0.24$ ,  $p = 0.092$ ), and the shape index ( $r = -0.25$ ,  $p = 0.085$ ).

### 6.3.4.2 Correlations involving the dissociation sub-scales.

As a final analysis, the Stroop data was examined in relation to the dissociation measures' sub-scales. Prior to analysis, the dissociation sub-scales were examined for distorted data distributions. The DES II sub-scales all demonstrated significant skew (absorption skew  $z= 7.81$ ; kurtosis  $z= 12.9$ ; de-personalisation/de-realisation, skew  $z= 4.45$ , kurtosis  $z= 2.97$ ; amnesia skew  $z= 5.04$ , kurtosis  $z= 3.23$ ). The DES II taxons also presented with unacceptable skew (pathological taxon skew  $z= 3.51$ , kurtosis  $z= 1.41$ ; non-pathological taxon skew  $z= 3.46$ , kurtosis  $z = 3.27$ ). One extreme outlier was present on the absorption sub-scale, but a reciprocal transformation resolved the skew and reduced the impact of the outlier (skew  $z= 0.55$ , kurtosis  $z= -0.82$ ). The de-personalisation/de-realisation scale improved under a square-root transformation (skew  $z= 0.65$ , kurtosis  $z= 1.10$ ), as did the amnesia scale (skew  $z= 0.65$ , kurtosis  $z= 1.10$ ). Both the taxon sub-scales also improved under square-root transformations (pathological taxon: skew  $z= 1.17$ ; kurtosis  $z= 0.08$ ; non-pathological taxon: skew  $z= 0.32$ , kurtosis  $z= 0.55$ ). In terms of the PAS sub-scales only the modification of control scale demonstrated excessive skew ( $z = 3.92$ ), which was moderately resolved after a square-root transformation (skew  $z= 3.13$ ). The means and reliabilities of the dissociation sub-scales are displayed below in table 6.5.

**Table 6.5.**  
**Means and reliabilities for the dissociation sub-scales.**

	Means (SD)	Cronbach's $\alpha$	Transformation required.
Absorption (DES II)	5.83 (2.78)	.85	Reciprocal
De-realisation/de-personalisation (DES II)	6.91 (7.79)	.72	Square-root
Amnesia (DES II)	6.60 (9.14)	.29	Square-root
Pathological Taxon (DES II)	7.87 (8.12)	.72	Square-root
Non-Pathological Taxon (DES II)	20.6 (12.05)	.88	Square-root
Modification of affect (PAS)	22.16 (5.31)	.82	None
Modification of control (PAS)	16.68 (4.40)	.81	Square-root
Modification of cognition (PAS)	8.46 (1.76)	.51	None

Correlations between the dissociation sub-scales and the Stroop data are illustrated in table 6.6.. Bonferroni correction was adopted for all measures based on an explorative approach that controlled for the total number of correlations examined, rather than in terms of each variable of importance ( $\alpha = 0.001$ ).

**Table 6.6.**

**Correlations between dissociation sub-scales and the Stroop derived food and body shape concern variables.**

	Food Words	Shape Words	Food index	Body Shape index
Absorption (1/x DES II)	-.61*** (-.69***)	-.50** (-.57**)	-.21	-.01
De-realisation/de-personalisation (sq DES II)	.09	-.03	.33*	-.27*
Amnesia (sq DES II)	.36** (.70**)	.31*	.07	-.14
Pathological Taxon (sq DES II)	.24	.1	.17	-.12
Non-Pathological Taxon (sq DES II)	.26	.12	.22	-.27
Modification of affect (PAS)	-.08	-.15	.07	-.09
Modification of control (sq PAS)	.05	-.02	.08	-.05
Modification of cognition (PAS)	.12	.05	.07	-.04

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ . 2-tailed.

Bonferroni corrected alpha = 0.001

Transformations: sq = square-root, log. = logarithmic, 1/x = reciprocal.

Dis-attenuated correlations in brackets.

The overall pattern of correlations indicates that DES II absorption sub-scale was significantly and negatively related to the raw food and shape naming latencies, but not to the either of the change indices. The amnesia items, were also related to the raw food latencies, but again no significant correlations were found with either the body shape or the control change indices. Dis-attenuation of the amnesia sub-scale, which showed an extremely low reliability rating, dramatically increased the correlation between itself and food latencies. However, care must be taken with this result given the extremely unreliable nature of the amnesia sub-scale. Partialling out BMI, age, and weight did not affect the above correlations (table 6.6) except for a loss of significance for the amnesia food words relationships ( $r = 0.27$ ,  $p = 0.06$ ). Also, partialling out depression and social desirability also did not affect significantly alter the correlations.

#### 6.4. Discussion of study 4.

There was no evidence that hypnotic suggestibility related to food concerns or body shape/weight dimensions that possibly underlie dietary concerns. These findings

fail to support a Socio-Hypnotic interpretation of food and body shape related concerns, indicating that hypnotic suggestibility was not a potential factor associated with the internalisation of such concerns. However, the underlying cognitive dimensions of food and body shape concerns were not associated with either self-report measures of dietary restraint or identified differences between restraint and non-restraint classifications of individuals. In terms of dissociation, no overall associations were found between either cognitive or affective dimensions of dissociation or any of the Stroop latencies related to either word frequency controlled and non-controlled body shape or food concern related words. This finding indicates that dissociation may not be a factor associated with escape or coping with such concerns. A correlation between absorption dimensions of the DES II did suggest some influence, but as this was not found when word frequency was controlled for the interpretation of this is more relevant to methodological considerations than to underlying theoretical themes related to coping strategies.

An initial concern of this study was to investigate if a behavioural measure of body shape and food concerns, using an 'Eating Stroop' paradigm based on colour naming latencies for body shape and food words, would distinguish groups of non-clinical restrained eaters from non-restrained eaters defined using a number of different measures of restraint. However, a main concern of this study was whether the body shape and food concerns derived from the Stroop procedure would correlate with measures of hypnotizability, and different types of dissociation.

An index of relevant body shape and food concerns, derived by subtracting overall latencies for food and body shape from latencies based on neutral control words, indicated no differences between restrainers and non-restrainers using either concerns for dieting, cognitive restraint, or drive for thinness as restraint categorisation variables. This result goes against findings by Perpiñá et al (1993) and Green and Rogers (1993) who found that a group containing non-clinical restrainers were significantly slower on colour naming of food and body shape related words compared to non-restrainers. However, Perpiñá et al.'s findings were based on a group including eating disordered individuals, i.e. a group of individuals who demonstrate extreme concerns over body shape and weight, a factor that may have artificially elevated the overall restrainer group means. The current study excluded data from individuals who had reported a previous or current psychological or medical eating disorder diagnosis or treatment. This was



done in order to examine the influences of cognitive factors, hypnotizability, and dissociation in non-clinical contexts. The exclusion of such self-report eating disordered individuals may have prevented obtaining significant restraint-related Stroop effects by reducing the range of both restraint scores and the extremity of body shape and food concerns. In relation to Rogers and Green (1993), their study used a more global measure of restraint to define high and low restrainers, which may have captured a more wide-ranging level of concerns than the restraint measures used in the current study.

Another possibility for the differences between this and other studies was the mode of presentation used. In standard Stroop paradigms, a list or block of words is presented related to a category of interest, e.g. food or body shape. However, in this study words were randomly selected from across categories of both target food and shape related words, and neutral control words, as an attempt to eliminate order effects and reduce potential habituation related to over exposure to concern words (e.g. Green & Rogers, 1993). The semantic relationship between words may therefore have been less salient than in the traditional paradigm, with less interference as a result. Another important issue was the use of clothes words as control for body shape, which may have introduced a body shape effect into naming latencies for the control words that may have obscured underlying differences between groups.

The lack of significant differences of colour naming latencies for body shape and food concern words between the restraint groupings sampled in this study is somewhat unexpected given that a majority of individuals indicated they desired to be slimmer than they currently were. There were only minor correlations between target concern words for food and body shape latencies in relation to concern with dieting and cognitive restraint of eating, which indicated that the Stroop derived measures are not strictly measuring the same construct as self-report measures of dietary restraint.

Despite being of interest, differences between restrainers and non-restrainers were secondary given the principal concern of this study, which was to use the Stroop colour name latencies as more direct behavioural measures of concerns potentially related to both the Socio-Hypnotic and Dissociative Escape hypotheses. However, these group-based findings are relevant as they indicate that non-restrainers and restrainers cannot be readily distinguished using cognitive related dimensions of body shape and food concerns. The cognitive features of body shape and food concerns may not be

sufficiently accentuated to promote actual differences between non-clinical restrainers and non-restrainers, either due to the particular experimental manipulation used or due to being fairly pervasive features of everyday social life (Streigel-Moore et al, 1986).

#### Hypnotizability and dissociation in relation to body shape and food latencies.

Initial correlations revealed that there were no significant correlations between hypnotizability and any of the food or body shape latency variables. This goes against the Socio-Hypnotic hypothesis (Groth-Marnat & Schumaker, 1990; Frasilho & Oakley, 1997) that the internalisation of social cultural pressures regarding body shape and eating concerns that the Stroop latencies for food and body shape may be related to, are influenced or indexed by hypnotizability or processes related to hypnotizability.

Raw latencies for the food words demonstrated modest correlations with overall cognitive dissociation and affective dissociation scores, but were non-significant after Bonferroni correction. This indicates at least one of two possibilities. First, that the types of dissociation measured may not be involved in a coping strategy related to such concerns. Second, that the underlying food and body shape related cognitive factors may not be involved in a dissociation-related coping model of dietary restraint and dietary disinhibition suggested by McManus (1994). However, the absorption sub-scale of the DES II correlated strongly with the raw food and body shape colour naming latencies. This correlation with absorption may indicate that increased absorption-type dissociation does act as a defence against the semantic contents of the food and body shape words. Such a defence may be interpreted as a potential automatic focus on the ink colour as a means of preventing awareness of the semantic features of an aversive word. This interpretation is problematic, as recognition of the semantic content of the word should hypothetically lead to greater initial processing of the affective word, leading to increased latencies (e.g. Williams, et al, 1996).

The association between absorption and the raw scores may have a more methodological interpretation. When controlling for respective word frequencies the above correlations involving cognitive absorption disappeared providing support for a methodological artefact. The body shape index appears to be a more appropriate measure of body and food concerns as it control for word frequency. One possible

methodological explanation for the association with absorption in the absence of affective related factors, given the correlations between the absorption sub-scale and the raw latency scores were negative and fairly strong, is that a tendency to become absorbed may help fixate attention on the relevant features of a stimulus e.g. ink colour. The lack of association between depression and the Stroop latencies, either in raw format or with word frequency controlled for, also suggests that in terms of depression at least the cognitive factors related to body shape and food do not impact on a person's affective state. The fact that no correlation was found with depression may indicate that the cognitive features of weight, food and body shape concerns may not be the main reason for the expression of defence related problematic eating in this sample as they do not relate to the current level of an individual's negative mood. The possibility remains that other forms of affective reaction such as anxiety may be related to the Stroop stimuli and related to dissociative coping mechanisms consequent of underlying features related to the possible longer term effects of such biased-stimuli processing.

One major methodological problem with the current study was the use of different word frequencies lists for the target words. It is also problematic that the word frequency lists used in this study are fairly old (e.g. Kucera & Francis, 1967) and based on American written English, given the young age of the UK English speakers used in this study. This is a common problem that has been generally overlooked in the Stroop literature examined in the introduction of this chapter. However, as the aim of this study was in part to attempt to replicate previous findings in terms of target word latencies using non-clinical restrainers instead of clinical groups, a set of word lists that have been used before seemed appropriate. The target and control words used in this study were taken from studies that used UK English speakers (Green et al, 1994; Lovell, et al, 1997). Green et al used undergraduate students from Reading University, England, and outpatients from Heatherwood Hospital in Ascot, England. Lovell et al, used students and local participants from around the Bangor area, North Wales, while patients were recruited via local healthcare professional, support groups, and newspapers. The exact population and linguistic characteristics of patient and control samples, including ethnic origins, were not cited in either paper. However, the original problems of older lists and American type English still remains a possible confound. In future studies alternative word frequency lists could be used such as Hofland and Johnson (1982), which focuses on more recent British English word frequencies.

Further methodological improvements would be to control for other word properties beyond written frequency such as imagability indices and concreteness.

## Chapter 7

### General Summary and Conclusions

#### Chapter overview

This final chapter briefly summarises the initial position of this thesis, and what has been covered in the empirical work. Suggestions for future directions in this research are discussed.

#### 7.1. Initial background and aims of the thesis.

This thesis began with an examination of clinical studies in which higher levels of hypnotizability and dissociative-type experiences were found in groups of patients with eating disorders, in particular patients with bulimic symptoms. Covino et al. (1994) also found that while patients with bulimic symptoms tended to be more hypnotizable than non-patient controls, the patients' level of hypnotizability was not related to features bulimic symptoms such as symptom severity or chronicity. Dissociation, however, does seem to be related to bulimic symptoms, especially bingeing frequency (e.g. Everill, et al, 1995; McManus, 1995), but unlike hypnotizability the level of dissociative experience in bulimics is not particularly elevated in comparison with general population norms, despite the significant differences found when using non-clinical control groups. It was suggested in chapter 1 that hypnotizability and dissociation, despite being related factors in individuals with bulimic symptoms (Pettinati et al, 1984; Covino et al, 1994; Vanderlinden, et al, 1995), may influence different aspects of eating disordered behaviours. Covino et al, (1994) suggested that hypnotizability might play more of a role in the initial formation of eating disordered symptoms than their maintenance and severity, whilst Everill et al (1994) suggested that dissociation may play a number of possible roles in relation to specific of bulimic behaviours such as bingeing and/or purging. These differential relationships between hypnotizability, dissociation, and features of eating disorders formed the initial starting point for extending such research into the non-clinical domain.

A number of non-clinical studies have found that hypnotizability scores and measures of hypnotic-like experiences were moderately associated with concerns related to dieting, fears of weight gain, and the cognitive regulation of eating (e.g. Groth-Marnat and Schumaker, 1990; Frasilho and Oakley, 1997). Such findings led to the formulation of a hypothesis based on Covino et al.'s work (1994) related to the potential role of hypnotizability as an index and/or influence of the internalisation of social pressures to diet and restrain eating, the so-called Socio-Hypnotic Hypothesis. Dissociation has also been found to correlate with a number of eating disordered attitudes and behaviours (e.g. Rosen & Petty, 1994; Valdiserri & Kihlstrom, 1995a) in non-clinical samples.

A second major hypothesis examined in this thesis related to the potential influence of different types of dissociation on disinhibited eating within non-clinical sample, captured under the Dissociative Escape Hypothesis. This hypothesis was based on the conception of binge eating as a result of a defensive strategy against aversive self-realizations. The original Escape Hypothesis proposed by Heatherton and Baumeister (1991) suggested when certain individuals are presented with or experience an aversive self-realization their initial reaction is to shift attention away from the meaning of such realizations towards lower level processing of somatic information. While such a shift to more basic levels of meaning allows a momentary escape from the implications of the aversive thoughts, it may also reduce access to psychological inhibitory functions that help regulate restrictive eating behaviours. For individuals who rely on psychological control as a means to restrict eating, lack of inhibitory psychological processing leaves them vulnerable to disinhibition of eating. Dissociation has also been interpreted as a means of defending against aversive realizations, and it too implies a separation of thoughts or feelings from conscious access and regulation. There is, therefore, a possibility of re-interpreting the original escape hypothesis in terms of dissociative process rather than shift between levels of meaning. In other words, dissociation, which has a potential defensive role against aversive cognitions (e.g. Spiegel, 1986; Cardeña, 1994), may also act in such a way as to suppress control of inhibitory food regulation, either as a direct result of the dissociative defence process itself, or as a result of long-term reliance on such processes. While dissociative defence mechanisms are generally examined within the domain of clinical research, the possibility that less pathological types of dissociation may have analogous effects in non-clinical populations provided a rationale for exploring relationships between the

capacity to dissociate and levels of less pathological forms of disinhibited eating behaviours.

Based on the clinical and non-clinical findings summarised here and reviewed in more detail in chapter 1, this thesis proposed to examine the extent to which hypnotizability and dissociation are relevant factors in understanding patterns of dietary restraint and dietary disinhibition concerns and behaviours. A principal aim of the empirical studies in this thesis was to examine the extent to which hypnotizability, hypnotic-like experiences, and potentially different types of dissociative phenomena, were related to, and/or predictive of, different features of dietary restraint, dietary disinhibition, and relations between different measures of these two factors.

As already mentioned, two important features of non-clinical eating formed the focus of the research in the thesis. These were the related concepts of dietary restraint and dietary disinhibition. These factors were examined on the basis of the two overall research hypotheses. The Socio-hypnotic Hypothesis suggests possible relationships between hypnotizability and the internalisation of socially derived dietary restraint concerns. In terms of the Dissociative Escape Hypothesis it was suggested that a dissociative mechanism could be underlying features of disinhibition of eating in certain non-clinical individuals. Dietary restraint as measured by a number of restraint scales, focuses on the *psychological* regulation of eating behaviour (e.g. Herman & Mack, 1975), and therefore provides a good conceptual basis for processes that motivate it and lead to its disinhibition.

## **7.2. Hypnotizability and patterns of non-clinical dietary concerns and behaviours.**

In chapter 2 it was argued that hypnotizability is a complex individual difference. Despite various opposing theoretical viewpoints regarding what constitutes hypnosis and hypnotizability, there is general agreement that it is a complex, multidimensional, and multi-determined construct (e.g. Wagstaff, 1998) fundamentally based on responsiveness to suggestion. The basic nature of hypnotizability measures as indicators of receptivity to suggestions provided the principal motivation in pursuing the Socio-Hypnotic hypothesis.

In study 2 (chapter 4) of this thesis, the HGSHS:A (Shor & Orne, 1962), a widely used measure of hypnotizability, failed to significantly correlate with separate measures of dietary restraint related to concerns for dieting and cognitive regulation of food intake. This result therefore failed to support a Socio-Hypnotic type hypothesis. In study 3 (chapter 5), hypnotizability demonstrated slightly stronger relationships with factors relevant to the Socio-Hypnotic hypothesis, including relationships with fears of fatness/weight gain, concerns for dieting, and drive for thinness, but these were non-significant after Bonferroni correction.

Upon reflection, it may be that hypnotizability scales such as the HGSHS:A are perhaps too broad to capture specific relationship of interest (Woody, 1997) in this thesis. Also, potentially highly complex inter-relations surrounding the formation and expression of restraint concerns can create a great deal of unaccounted variance that prevents the localisation of significant effects. However, one significant procedural problem specific to study 2 was the implication that the study within which the hypnotizability measures were used was related to 'problematic' patterns of eating. This may have had an effect of distorting responding on certain measures, reducing the possibility of uncovering potential associations of interest. The possibility of distorting affects was supported by significant positive correlations between hypnotizability and social desirability (study 2) indicate that hypnotizability scores can be influenced by social desirable responses sets, however, this was not a robust correlation, as study 3 failed to find such a relationship.

Multiple regression techniques were used to examine possible relationships extending beyond basic zero-order correlations. It is important to examine any 'unique' variance which hypnotizability accounted for in dietary restraint measures, which remained after variance from other relevant sources was accounted for. Use of regression analyses helped uncover some hidden relationships amongst variables, in addition to controlling for overlapping variance between measures. In study 2, when variables such as cognitive restraint, body weight, BMI, age, social desirability, cognitive dissociation, affective dissociation, disinhibition of eating and susceptibility to hunger were controlled for, there appeared to be a statistically significant negative effect of hypnotizability on concerns for dieting. This finding suggested that higher hypnotizability would tend to reduce the experience of concerns for dieting, but only to a very small extent (less than 2% of variance in concern for dieting accounted for by hypnotizability). The negative effect of hypnotizability scores on concern for dieting



was supported by a small, but significant positive predictive effect of hypnotizability on cognitive restraint, a variable potentially indicative of successful restraint behaviours and attitudes.

Based on the Dissociative Escape Model, the presence of aversive cognitions, which may be related to the concerns for dieting measure used in study 2, may help trigger off bingeing or disinhibited eating. A capacity to retain higher level control over such cognitions, which may form a feature of hypnotizability (Crawford & Gruzelier, 1992; Crawford, Brown, & Moon, 1993; Crawford, 1994) may prevent the aversive cognitions from emerging and may reduce their potentially disinhibitory effects. However, as the initial findings from the regression analysis were not replicated in study 2 these interpretations must be treated with caution.

Summarising the findings in relation to hypnotizability, despite the lack of replication of the suppression effect of hypnotizability on concerns for dieting and the predictive effect on cognitive restraint, these findings do hold some theoretical possibilities. The possible underlying cognitive mechanisms that facilitate hypnotic responding (e.g. Crawford & Gruzelier, 1992; Crawford, 1994; Crawford et al, 1993) may also be relevant to a capacity to maintain attention on restrained eating, and dis-attend from disinhibiting influences. Such mechanisms may be related to a putative increased capacity in high hypnotizables to focus attention on particular stimuli, and dis-attend to others (Crawford & Gruzelier, 1992), without necessarily adopting dissociative strategies. The low level of predictions found may be due to the testing instruments used, in that whilst cognitive control factors may be related to hypnotic responding and cognitive restraint, hypnotizability tests are not a good means of directly measuring the operation of such processes. Future research can address such difficulties by using tasks specifically designed to investigate features of cognitive control and other cognitive features of dieting restraint. It is important to note that in study 3 there was a clear relationship between hypnotizability and disinhibition, which further indicates caution in speculating on the processes involved. Although this disinhibition relationship was somewhat weak, it does suggest loss of control over eating rather than increased control, and introduces another inconsistency in the data.

Theoretically, a capacity to focus attention may also be related to Heatherton & Baumeister's (1991) original Escape Hypothesis. The capacity to adopt a highly focused

attentional orientation towards somatic stimuli, which Heatherton and Baumeister (1991) suggest serves the purpose of diverting processing resources away from the meaning of aversive self-realizations. These issues also revolve around the extent to which individuals' attentional and dis-attentional capacities are rigid or flexible in terms of control over the subsequent shifting of attention. It is therefore a case of how attentional resources are used, and recruited, rather than the capacity to employ such resources *per se*, which may be of importance. So while hypnotizability has shown weak relationships with both disinhibition of control and cognitive restraint, a situation that appears to be contradictory, there may be different facets of process underlying hypnotizability that are more related to disinhibition or cognitive restraint dependent on the sample tested and the procedures used. The complex interactions between environmental contexts and mental processes supporting different levels of hypnotizability can allow for different features of the hypnotizability construct to apply to different situations and measures.

One means of examining the role of hypnotizability as an influence on various factors such as dietary restraint and disinhibition is to look at its potential effect as a moderator. Potential moderating effects of hypnotizability were measured in study 3, using techniques based on regression analysis of interaction terms (Cohen & Cohen, 1983; Baron & Kenny, 1986). These procedures can help explore the potential influence of hypnotizability on regulating the relationship between various factors related to social-cultural models of influence upon eating, such as fears of fat/weight gain, body dissatisfaction, and aspects of dietary restraint. Unfortunately, study 3 demonstrated no indications of a moderating influence of hypnotizability on the measures examined, however, as discussed in section 5.4., none of these measures were direct operationalisations of social pressures *per se*, so the hypnotizability moderating hypothesis was not fully explored. In addition, the fairly small sample size may have added additional problems in finding such moderating effects due to low statistical power.

Measures of social influence that should be examined in future studies of the moderating hypothesis include a recently developed and validated scale of specific social influences focused on family, peer group, and partner pressures to obtain a thin/slim body shape (Stice, 1998, personal communication). Other measures that can be

adopted include the level and nature of social interaction with mediums that transmit social influences, such as the media, the family, and the peer group (Stice, 1994).

The principle use of hypnotizability in this thesis was to extract an overall score relating to general hypnotic ability, however, as suggested by Woody and Balthazard (1989), this procedure may obscure a number of different underlying factors acting on the range of hypnotic suggestions. Study 2 examined correlations between three factors extracted from the set of dietary concern and disinhibition measures, and items on the HGSHS:A, in order to find if different clusters of items were more related to the three factors of restraint and disinhibition, weight, and loss of control over eating. Unfortunately, there were no significant patterns of correlations between the eating factors and the hypnotizability items. Again, this may have been due to the specific content of the hypnotizability scale used. As mentioned before, the HGSHS:A is mainly a behavioural scale, which incorporates some elements of cognitive experiences. While the HGSHS:A has a great deal of pragmatic value, and has been widely used as a screening instrument for hypnotizability, other, more difficult scales, such as the Stanford Scale of Hypnotic Susceptibility: form C contain items which allow the exploration of hypnotizability along more cognitive dimensions, in addition to behavioural components. Combining multiple testing agendas was beyond the scope of this thesis in terms of available time, but such procedures can further improve understanding of possible relationships between features potentially underlying hypnotizability and factors involved in the socio-hypnotic hypothesis. However, with these comments in mind, the research in this thesis suggests that support for the type of hypnotizability measured in this thesis as a factor in the internalisation of social pressures (e.g. Groth-Marnat & Schumaker, 1990; Frاسquilho & Oakley, 1997) and restraint related attitudes and concerns is weak at best.

### 7.2.2 Reconsidering the roles of hypnosis and hypnotizability in relation to the themes examined in the thesis.

In chapter 2, consideration of the so-called Socio-Hypnotic approach began by stating that hypnotic suggestibility and waking suggestibility may very well share the same components responsible for good responsiveness to suggestion. Based on this premise a measure of hypnotic suggestibility was used to seek out hypothesised correlations between responsiveness to suggestion and level of dietary concerns related

putatively to the internalisation of socio-cultural factors. In hindsight, and as a result of the findings from chapter 2, chapter 3 and chapter 4, it is clear that hypnotizability was not the best approach to exploring the factors or components that are related to possible suggestibility associated internalisation of socially orientated dietary restraint pressures. It is also plausible that the measure of hypnotizability used, although a widely utilised instrument, did not capture features such as imagery capacity and social compliance pressures that may relate to a Socio-Hypnotic interpretation of dietary restraint concerns.

A better approach would have been to explore in more depth the possible components of the Socio-Hypnotic view from a social psychological framework of conformity and suggestive influence separate from the notion of hypnosis. McGuire's (1989) mediational theory of social influences mentioned at the end of section 2.1.8.3 provides a workable framework for pursuing this possibility. As mentioned above components of the Socio-Hypnotic approach such as compliance and imagery related information processing still hold promise as relevant features of a suggestibility interpretation of dietary restraint. This is especially true in relation to the findings of study 1 in chapter 3, which will be discussed in the next section. However, it is potential important to examine such components in the wider framework of how a persons experience of self relates to dietary restraint pressures. Factors such as the formation and alteration of self-esteem, the relative importance of conformity and persuasion mechanisms and the role of emotional reactions, all hold promise in understanding how suggestion may play a role, if it does at all, in the formation of dietary restraint concerns and related eating attitudes and behaviours. Vital to this endeavour is the recognition that suggestion and suggestibility are complex constructs involving the complex interaction of multiple processes. The issue still remains whether dietary restraint concerns are related to social pressure that revolves around female body aesthetic and discontent with body shape and weight, and what processes may moderate the internalisation of such discontent.

As a final point, it is important to note that throughout this thesis measures of dissociative experiences have failed to correlate with hypnotizability. This weighs heavily against dissociative interpretations of hypnotic responding as a phenomenon based on dissociative mechanisms. It is possible that the self-report measures of dissociation used in this thesis do not capture the type of dissociation that some theorists

would consider relevant to hypnotic suggestibility. However, the most parsimonious explanation given the data presented in this thesis is that dissociative processes are not related to hypnotizability.

### **7.3. 'Waking' suggestibility, body image malleability, and Stroop latencies for body shape and food words.**

Study 1 attempted to examine potential relationships between a waking suggestibility type measure, dietary restraint, dietary disinhibition, and features of body related anxiety. Initial correlations indicated that general waking suggestibility was related to measures of concern for dieting. Specific suggestions for body size increase were related to a wider range of dietary restraint features, including concern for dieting, cognitive restraint of eating, disinhibition of eating, and state/trait measures of body fat anxiety. Categorising participants as either high or low in terms of different types of restraint led to significant interactions between restraint status and the subjective reality of imagined body size changes. These interactions indicated that while restrainers and non-restrainers were relatively similar in terms of imagining body size decreases, restrainers, regardless of which scale was used to categorise them, tended to imagine body size increase significantly better than non-restrainers.

The subjective reality of the body size increase scenarios used in study 1 for were on average rated as much the same as a real experience (3 on the MCIS rating scale, out of a maximum rating of 4, higher scores indicate greater subjective reality of experiences) by both concern for dieting restrainers, and cognitive restrainers. This effect was interpreted as a potential route for aversive realisations related to negative 'potential selves' (Green & Saenz, 1995), which may not only motivate restraint concerns, but also lead to disinhibition of eating in terms of Heatherton and Baumeister's (1991) Escape Hypothesis. The relation between aversive reactions to body increase suggestions was supported by strong positive correlations between such suggestions and the physical anxiety and disinhibition of eating measures used. These findings may suggest a more fear or fat type process as opposed to a drive for thinness.

There was also a clear effect of the order of exposure to the body image suggestions in restrainers defined in terms of concerns for dieting. Cognitive restrainers

tended to rate body size increase items high regardless of the order it was presented in the Modified Creative Imagination Scale. However, for the high concern for dieting restrainers the body size decrease item was only given high ratings of subjective reality when it was the most recent exposed body image item i.e. when it was presented after the body size increase item. As this effect occurred only when the body decrease items was most recent, perhaps the recentness of exposure plays an important role in triggering an ability to picture oneself as thinner and slimmer. In terms of correlations, when the body decrease item was the last body item exposed there was a significant correlation between it and the trait body fat anxiety scale, a relationship not present in the overall correlations when counterbalancing was accounted for. Whether this potential exposure effect indicated that body size decrease may also trigger aversive self-realizations, i.e. by presenting in some individuals a thinner, but not actual self, remains an issue under consideration. Such a process may partially account for results found by Seddon and Berry (1996) who found that exposure to media advertisements, which contained thin/slim female individuals, trigger disinhibition of eating in restrained participants. The specific correlation between the thin body items and disinhibition of eating in relation to restrainers under conditions of recent exposure was not investigated in this study due to the small sample sizes involved, but remains an issue for empirical investigation. However, as there were no significant correlations between the body image decrease item and disinhibition, either overall or in terms of different orders of exposure, there is no support for the role of imagined body size decrease in triggering disinhibition of eating.

In general, the impact of a capacity to experience subjectively realistic changes in body image, a feature initially termed body image malleability (Frasquilho & Oakley, 1997) may be of importance in understanding a number of features of dieting concerns and related behaviours. The concept of body image is complex, and is likely to involve features of cognitive, perpetual, and emotional processes, related to the perception of self and ones appearance (e.g. Szymanski & Cash, 1995). Little research has been done examining the relevance of suggestions to the experience of body image and the extent to which such experiences may impact on dieting concerns and general psychological well being. On the basis of the procedures used in study 1, it is uncertain whether the increased subjective reality of body image changes in restrainers versus non-restrainers is a general consequence of everyday dieting concerns and behaviours, or a more causal factor involved in the disinhibition of eating. One possibility is to examine the effect of

body image manipulations of the disinhibition of actual eating, using a free eating 'taste test' session immediately after exposure to body image malleability suggestions. There was insufficient time to conduct such as study as part of this thesis, but pilot testing has indicated that for very high restrainers (scorers in the upper quartiles of restraint measures ranges) amount eating is higher than non-restrainers, though the small sample size revealed no significant differences.

In Stice's (1994) model, which provided the theoretical background for a number of measures used in this thesis, body dissatisfaction is related to a psychological comparison between ideal and self-perceived body image. The extent to which suggestion plays a role in manipulating body dissatisfaction needs to be further examined, especially in relation to other factors such as level of media exposure and social pressure to achieve a thin body ideal. The extent to which self-perception of that body is open to the attitudes and communication of other may play a central role in understanding motivations to restrain, and processes that interfere with such motivations.

The general effects of body size increase, and the specific exposure-type effect may be in part related to the accessibility of such body concerns to an individual, a factor examined in the final study of this thesis, study 4, using a Stroop paradigm. An initial motivation for conducting study 4 was to examine differences between restrainers and non-restrainers in terms of increased delays for naming the ink colours for food and body shape related words, in relation to written frequency control words. Such delays would be more behavioural indicators of concerns with food and body shape, and potentially supplement the use of self-report measures of such factors. However, there were no elevated ink naming latencies for restrainers compared to non-restrainers in relation to body shape and food words, indicating that either such non-clinical restraining groups do not exhibit behavioural features of their apparent restraint, or that the Stroop task is unable to pick up such concerns. However, the Stroop food and shape word latencies were weakly related to concerns for dieting, cognitive restraint, and the revised restraint scale total score. When accounting for word frequency no significant correlations occurred between the Stroop based concern variables and the dietary restraint self-report measures.

In general these results suggested that the type of Stroop test used in this study may have failed to pick up on dietary restraint related concerns, especially as self-report measures of body dissatisfaction and dieting did not correlate with the food and body shape concern words. There was also no relationship between hypnotizability, which again suggested either a failure of the Stroop task to measure dietary restraint and related concerns in a non-clinical setting, or that the Socio-Hypnotic hypothesis does not hold. Item based analysis of the Stroop words may reveal specific associations of interest, but as the Stroop variables showed very good internal consistency there may be no empirical reason to separate off items. It should be noted, however, that there were significant findings involving dissociation, which will be discussed in the next section.

Before moving onto the next section, it should be mentioned that the body image suggestions used in study 1 appear heavily based on imagery related processes. If this is indeed the case then a study of the nature and biases in imagery capacity for restrainers and non-restrainers may be a fruitful avenue of research. This would be an especially powerful approach if a variety of different measures of body image representation were combined with procedures examining information processing of body imagery and the different means of instilling body imagery suggestions and related manipulations.

#### **7.4. Dissociation and non-clinical patterns of dietary concerns and behaviours**

In a number of studies carried out in this thesis, various relationships have been found between dissociation and features of disinhibited eating and dieting concerns. The general finding was that affective dissociation was more related to a number of different types of restraint concerns and disinhibition of eating than cognitive dissociation. In previous studies, Rosen and Petty (1994) and Valdiserri and Kihlstrom (1995a) have suggested relationships between dissociation and features of problematic eating. As already mentioned throughout this thesis, a number of possible definitions of such relationships exist in terms of non-clinical populations. Dissociation may act as a general disruptive influence on eating behaviours, leading to loss of control and bingeing related behaviours. Alternatively, dissociation may be the result of certain eating practices that give rise to feelings of separateness from the self and world. As mentioned previously, another possibility is that the defensive role that types of dissociation putatively embody may lead to loss of control over eating behaviour as a result of cognitive mechanisms designed to defend against aversive self-realizations,



with these types of explanation derived from Heatherton and Baumeister's (1991) Escape hypothesis (e.g. McManus, 1995)

Study 2 found that cognitive dissociation was more related to susceptibility to hunger than features like dietary restraint and disinhibition, while affective dissociation related more to concern for dieting and disinhibition of eating. When examining potential dissociation sub-scales it was clear that affective dissociation based on more modification of control features was related to concern for dieting and disinhibition of eating, in addition to susceptibility to hunger. Potential this indicated a disrupting effect of dissociation on the control needed to maintain non-disinhibited eating.

Regression analyses of these relationships found that affective dissociation predicted disinhibition of eating, but only when the dietary restraint measures, especially concern for dieting, were not included in the equation. It is difficult to speculate on these findings as the regression coefficients produced were fairly low and the semi-partial *r*s were very small, indicating little predictive effect. The use of path analysis greatly increased the interpretability of the correlations and the regression models, but the path analysis was restricted to examining routes to disinhibition of eating in relation to social desirability, and cognitive restraint. The original path model postulated that measures of dietary restraint and disinhibition are related, i.e. predict, to a certain extent, variance in the disinhibition of eating, which is a feature with a fair degree of experimental evidence (see section 2.2. for review). The initial path model was intuitively appealing, indicating that cognitive restraint, a factor related to more successful control of eating, suppressed disinhibition of eating, whilst concern with dieting, a factor related to chronic dieting concerns and behaviours was highly predictive of disinhibition of eating. Affective dissociation appeared to mediate the relationship between concern for dieting and disinhibition of eating, but only to a small extent, with the principle route being between concern for dieting and disinhibition of eating. Inclusion of social desirability in the path model altered the predictive pathways, possibly through the suppression of responding to non-socially desirable items on the affective dissociation and disinhibition of eating measures. The only significant paths to disinhibition of eating once social desirability was included were between concern for dieting and a suppression effect from social desirability. Overall, it is apparent that the use of powerful regression techniques such as path analysis can help elucidate potential

relationships, but these relationships are dependent on the variables included for analysis.

The importance of careful consideration concerning the variables used in analysis was demonstrated in study 3, where obtained correlations between different factors of restraint, disinhibition and affective dissociation were greatly reduced when depression was partialled out of the relationships. Social desirability had little impact on altering the significance of relationships, although it did reduce some associations in studies 2 and 3. Regression models incorporating depression, social desirability, and a number of factors such as body dissatisfaction and fears of fat/weight gain, hypothetically related to cognitive restraint, concern for dieting, and disinhibition of eating, furthered understanding of such relationships. Cognitive dissociation appeared to have a moderate predictive effect on cognitive restraint when all other factors, including depression and affective dissociation were statistically controlled. This may imply that cognitive dissociation may facilitate maintenance of successful, dieting, but is perhaps more related to a common cognitive control element. However, the predictive direction was positive indicating that cognitive restraint increases as cognitive dissociation increases. Given the relationship between cognitive dissociation and susceptibility to hunger found in study 2, potentially cognitive dissociation can act as a means of defending against hunger related disinhibition that may suppress cognitive restraint, though this is unlikely as susceptibility to hunger and cognitive restraint are not negatively correlated.

Affective dissociation significantly predicted concern for dieting when all other variables were controlled for. This is a more interpretable finding and operates in relation to features of the Dissociative Escape Hypothesis. One possible interpretation is that negative concerns related to dieting may trigger affective loss of control reactions predicted in terms of dissociative defence and escape from self-realizations. However, whether the presence of affective dissociative reactions facilitates the disinhibition of eating in relation to dieting concerns and other potentially aversive cognitions, remains to be tested in the laboratory. Behavioural paradigms involving the manipulation of potentially disinhibitory eating, that may in addition take account of level of affective dissociation as a covariate, may further elucidate potential relationships between restraint, disinhibition, and dissociative experiences. The lack of relationships between self-reported disinhibition of eating and affective dissociation, and the lack moderating

effects of affective dissociation between restraint-disinhibition relationship suggests, on a non-behavioural level, that affective dissociation is not involved in disinhibition of eating.

It is important to note that the above findings only occurred when the other principal restraint variable was included in the regression equations, i.e. cognitive dissociation only predicted cognitive restraint when concern for dieting variance was removed from the cognitive restraint variable. The same was found for affective dissociation in relation to concern with dieting, i.e. predictive relationships only held when variance due to cognitive restraint was removed from concern for dieting. These complex findings suggested that potentially cleaner levels of the restraint factors can be achieved when other forms of restraint correlated restraint features are removed. Cognitive dissociation may relate more to cognitive restraint that does not include variance due to other forms of restraint, while affective dissociation relates more to concern for dieting features when cognitive restraint variance is removed. It is also important that neither type of dissociation predicted disinhibition of eating, which implied, given the results from study 2, that dissociation relates to the restraint measures, rather than to disinhibition per se. Given the path analysis in study 2, this may suggest that the impetus to dissociate is triggered by forms of dietary restraint, whether this subsequently leads to disinhibition of eating or to the maintenance of restraint depends on the type of restraint and dissociation involved, if the word 'type' can be used in this context. Complex path models, not conducted in this thesis, may be able to examine these relationships, incorporating more complex features such as reciprocal causation and interaction effects. However, as no moderating effects were noted for either type of dissociation in relation to restraint-disinhibition relationships, it is unlikely given these results that levels of dissociative experience impacts on the loss of control over eating.

The use of path modelling and perhaps regressions based on the dissociation sub-scales as dependents may help further elucidate some of the inconsistencies in the above findings. However, it is important to examine in detail the different sub-scales of the dissociation measures used, as each scale appears to have a multi-dimensional nature that needs to be addressed. Further factor analytical techniques could have been employed, such as confirmatory factor analysis, to further validate the dissociation sub-scales, and then use these scales as criterion variables in regression analysis.

## **7.5. Back to Square one?: Future directions.**

An important issue in relation to hypnotizability is the nature of suggestibility and how factors underlying suggestion impact on an individual's psychological functioning. The examination of suggestion has not received a great deal of research input in the past few decades (Geoghui & Kruse, 1991). Although there is a wide interest in examining the social cultural factors in part responsible for dieting concerns in clinical and non-clinical samples, the mechanisms by which such factors influence cognition and behaviour have not been well examined (e.g. Stice, 1994). Social contexts such as the family, peer group, and media, may be important domains to examine in relation to the formation and expression of suggestions and how they impact on an individual's psychological well being (e.g. Slade, 1982; Stice, 1994).

Gheorghiu (1991) proposed that the essence of suggestion is its disambiguating role in the face of an ambiguous or uncertain reality. Disambiguating reality is an important factor in everyday life. Schumaker (1991a) reviews a number of positions which indicate the importance of suggestion in everyday human activity, especially the way it allows individuals to construct a shared social existence that contributes to increased psychological health. However, though the process of suggestion is generally adaptive, the social contexts in which it is located may not be. This is one potential interpretation of the Socio-hypnotic hypothesis for the internalisation of unhealthy dieting practices and concerns.

In hypnotic contexts, the way an ambiguous situation, such as being unable to unclasp your clasped hands, is resolved will indicate in part how suggestible an individual is. However, suggestion and suggestibility are themselves complex multidimensional processes, involving features of compliance, persuasion, and at times intimidation. The way these processes work in potentially forming attitudes and behaviours in terms of eating and body shape concerns needs to be more fully researched, taking into account other potential variables and their interaction. The interactions between belief, health, and culture have been well explored by medical anthropologists (Helman, 1998) and health psychologists, but not as well examined by mainstream cognitive psychologists. A cognitive model of suggestion may provide a good basis for such an endeavour, especially in relation to an information processing

account of body image and experiences. These approaches can also be examined using statistical models, e.g. structural equation modelling and path analysis, that are emerging into mainstream health and clinical psychology.

In one sense, this research is in its infancy. The collecting of evidence indicating potential associations forms an important feature of this research program. In chapter 2 of this thesis, Stice's (1994) socio-cultural model provided a basic background into which speculation about hypnotizability could be introduced. Returning to that model, the original hypothesis indicated that hypnotizability may influence certain pathways between the internalisation of social concerns and psychological consequence of such internalisations. The initial basic hypothesis that increased hypnotizability should be related to increased dieting concerns and related behaviours is not well supported by research in this thesis. Again, this may be due to the complex nature of hypnotizability in general as gross measures of suggestibility. In relation to dissociation, there is some variable support for its effect in relation to disinhibited eating, especially in relation to affective related dissociation. However, a possibility that types of dissociation may be related to different features of dietary restraint, even when variance from depression is controlled for is another new avenue of research to be explored, in both self-report and behavioural settings.

## References.

- Abraham, S. F. & Beaumont, P. J. V. (1982). How patients describe bulimia or binge eating. *Psychological Medicine*, **12**, 625-635.
- Abramson, E. & Valene, P. (1991). Media use, dietary restraint, bulimia, and attitudes towards obesity: A preliminary study. *British Review of Bulimia and Anorexia Nervosa*, **5**, 73-76.
- Allison, D.B., Kalinsky, L.B., & Gorman, B.S. (1992). The comparative psychometric properties of three measures of dietary restraint. *Psychological Assessment*, **4**, 391-398.
- American Psychiatric Association (1980). *Diagnostic and Statistical Manual of Mental Disorders, edition 3*. APA: Washington DC.
- American Psychiatric Association (1987). *Diagnostic and Statistical Manual of Mental Disorders, 3rd edition - revised*. APA: Washington DC.
- American Psychiatric Association (1994). *Diagnostic and Statistical Manual of Mental Disorders, 4th edition*. APA: Washington DC.
- American Psychological Association (1993). Division of Psychological Hypnosis. Hypnosis, *Psychological Hypnosis*, **2**.
- Asch, S.E. (1956). Studies of independence and conformity: I A minority of one against an unanimous majority. *Psychological Monographs*, **70**, 416.
- Baars, B.J. (1988). *A cognitive theory of consciousness*. CUP: Cambridge.
- Balthazard, C.G. and Woody, E.Z. (1985). The Stuff of Hypnotic Performance: A Review of Psychometric Approaches. *Psychological Bulletin*, **98** (2), 283-296.
- Balthazard, C.G., & Woody, E.Z. (1989). Bimodality, dimensionality, and the notion of hypnotic types. *International Journal of Clinical and Experimental Hypnosis*, **37**, 70-89.
- Balthazard, C.G., & Woody, E.Z. (1992). The spectral-analysis of hypnotic performance with respect to absorption. *International Journal of Clinical and Experimental Hypnosis*, **40**, 21-43.
- Barabasz, M. (1991). Hypnotizability in bulimia. *International Journal of Eating Disorders*, **10**, 117-120.
- Barber, T. X. (1969). *Hypnosis: A scientific Approach*. Van Nostrand: New York
- Barber, T. X., Spanos, N. P., & Chaves, J. F. (1974). *Hypnosis, imagination, and human potentialities*. Pergamon: New York.
- Barber, T. X. & Wilson, S. C. (1978/79). The Barber Suggestibility Scale and the Creative Imagination Scale: Experimental and clinical applications. *American Journal of Clinical Hypnosis*, **21**, 84-108.

- Baron, R. M. & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychology research: Conceptual, Strategic, and statistical considerations. *Journal of Personality and Social Psychology*, **51**, 1173-1182.
- Barrett, D. (1992). Fantasizers and dissociaters: Data on two distinct subgroups of deep trance subjects. *Psychological Reports*, **71**, 1011-1014.
- Baucom, D.H., & Aiken, P.A. (1981). Effect of depressed mood on eating among obese and non-obese dieting and non-dieting persons. *Journal of Personality and Social Psychology*, **41**, 577-585.
- Beahrs, J.O. (1983). Co-consciousness: a common denominator in hypnosis, multiple personality, and normalcy. *American Journal of Clinical Hypnosis*, **26**, 100-13.
- Beck, A.T., Ward, C.H., Mendelson, M., Mock, J.F. & Erbaugh, J.K. (1961). An inventory for measuring depression. *Archives of General Psychiatry*, **4**, 561-571.
- Bernstien, F. M. & Putnam, F. W. (1986). Development, reliability and validity of a dissociation scale. *Journal of Nervous and Mental Disease*, **174**, 727-735.
- Blanchard, F.A., & Frost, R.O. (1983). Two factors of restraint: Concern for dieting and weight fluctuation. *Behaviour Research and Therapy*, **21**, 259-267.
- Bongartz, W. (1985). *German norms for the Harvard Group Scale of Hypnotic Susceptibility, Form A*. University of Konstanz: Konstanz.
- Booth, D. A. (1994). *Psychology of nutrition*. Taylor & Francis: London.
- Bowers, K.S. (1990). Unconscious influences and hypnosis. In J.L. Singer (ed.) *Repression and dissociation: Implications for personality, theory, psychopathology, and health* (pp.143-178). University of Chicago Press: Chicago.
- Bowers, K.S. (1992). Imagination and dissociation in hypnotic responding. *International Journal of Clinical and Experimental Hypnosis*, **40**, 253-275.
- Bowers, K.S., & Brenneman, H.A. (1981). Hypnotic dissociation, dichotic listening, and active versus passive modes of attention. *Journal of Abnormal Psychology*, **90**, 55-67.
- Braun, B. G. (1988). The BASK model of dissociation. *Dissociation*, **1**, 4-24.
- Brownell, K.D. (1991). Dieting and the search for the perfect body: Where physiology and culture collide. *Behavior Therapy*, **22**, 1-12.
- Bruch, H. (1973). *Eating Disorders*. Basic Books: New York.
- Bruch, H. (1977). Psychological Antecedents of anorexia nervosa. In R. A. Vigersky (Ed.), *Anorexia Nervosa*. Raven Press: New York.

- Bruch, H. (1982). *Anorexia nervosa: Therapy and theory*. *American Journal of Psychiatry*, *132*, 1531-1538.
- Butler, P. V. & Brynat, R. A. (1997). Assessing hypnotizability and dissociation in different contexts. *Contemporary Hypnosis*, *14*, 167-173.
- Button, E. J., & Whitehouse, A. (1981). Sub-clinical anorexia nervosa. *Psychological Medicine*, *11*, 509-516.
- Cardeña, E. (1994). The domain of dissociation. In S. J. Lynn & J. W. Rhue (Eds.), *Dissociation: Clinical and Theoretical Perspectives*. Guilford Press: New York, London.
- Cardeña, E., & Spiegel, D. (1992). Suggestibility, absorption, and dissociation. In J.F. Schumaker (ed.), *Human Suggestibility: Advances in theory, research, and application*. Routledge: London.
- Carlson, E. B. & Putnam, F. W. (1993). An update on the Dissociative Experiences Scale. *Dissociation*, *6*, 16-27.
- Carlson, E. B., Putnam, F. W., Ross, C.A., Torem, M., Coons, P., Dill, D., Lowenstein, R. J., & Braun, B. G. (1993). Validity of the Dissociative Experiences Scale: A multicenter study. *American Journal of Psychiatry*, *150*, 1030-1036.
- Carlson, E.B., Putnam, F.W., Ross, C.A., Anderson, G., Clark, P., Torem, M., Coons, P., Dill, D., Lowenstein, R.J., & Braun, B.G. (1993). Validity of the dissociative experiences scale in screening for multiple personality-disorder - a multicenter study. *American Journal of Psychiatry*, *150*, 1030-1036.
- Carlson, E.B., Putnam, F.W., Ross, C.A., Anderson, G., Clark, P., Torem, M., Coons, P., Bowman, E., Chu, J.A., Dill, D., Lowenstein, R.J., Braun, B.G. (1991). Factor analysis of the Dissociative Experiences Scale: A multicenter study. In B.G. Braun & E.B. Carlson (Ed.s), *Proceedings of the Eighth International Conference of Multiple Personality and Dissociative States*. Rush: Chicago.
- Carroll, J.B. (1961). The nature of data or how to choose a correlation coefficient. *Psychometrika*, *26*, 347-372.
- Chandarana, P. & Malla, A. (1989). Bulimia and dissociative states: A case report. *Canadian Journal of Psychiatry*, *34*, 137-139.
- Channon, S., Hemsley, D., de Silva, P. (1988). Selective processing of food words in anorexia-nervosa. *British Journal of Clinical Psychology*, *27*, 259-260.
- Cohen J., & Cohen, P. (1983). *Applied multiple regression / correlation analysis for the behavioural sciences (2nd ed.)*. Hillsdale, NJ: Erlbaum.
- Cools, J., Schotte, D.E., & McNally, R.J. (1992). Emotional arousal and overeating in restrained eaters. *Journal of Abnormal Psychology*, *101*, 348-351.
- Cooper, M. (1997). Cognitive theory in anorexia and bulimia nervosa: A review. *Behavioural Cognitive Psychotherapy*, *25*, 113-145.



- Cooper, M.J., Anastasiades, P., & Fairburn, C.G. (1992). Selective processing of eating-related, shape-related, and weight-related words in persons with bulimia-nervosa. *Journal of Abnormal Psychology*, **101**, 352-355.
- Cooper, M.J., & Fairburn, C.G. (1992). Selective processing of eating, weight and shape related words in patients with eating disorders and dieters. *British Journal of Clinical Psychology*, **31**, 363-365.
- Costello, C. G. (1972). Depression: Loss of reinforcers or loss of reinforcer effectiveness. *Behaviour Therapy*, **3**, 240-247.
- Covino, N. A., Jimerson, D. C., Wolfe, B. E., Franko, D. L., & Frankel, F. H. (1994). Hypnotizability, dissociation, and bulimia nervosa. *Journal of Abnormal Psychology*, **103**, 455-459.
- Crawford, H. J. (1994). Brain dynamics and hypnosis: Attentional and disattentive processes. *International Journal of Clinical and Experimental Hypnosis*, **152**, 204-232.
- Crawford, H. J. (1996). Cerebral brain dynamics of mental imagery: Evidence and issues for hypnosis. In R. G. Kunzendorf, N. P. Spanos, B. J. Wallace (Eds.), *Hypnosis and Imagination*. Baywood: New York.
- Crawford, H. J., Brown, A., & Moon, C. (1993). Sustained Attention and disattentive abilities: Differences between low and high hypnotizable individuals. *Journal of Abnormal Psychology*, **102**, 534-543.
- Crawford, H. J. & Gruzelier, J. (1992). A midstream view of the psychoneurophysiology of hypnosis: Recent research and future directions. In E. From & M. Nash (Eds.), *Hypnosis: Research developments and perspectives*. Guildford Press: New York.
- Crisp, A.H. (1965). A treatment regime for anorexia nervosa. *British Journal of Psychiatry*, **30**, 279-286.
- Crisp, A. H. (1967). The possible significance of some behavioural correlates of weight and carbohydrate intake. *Journal of Psychosomatic Research*, **11**, 117-131.
- Crisp, A.H. (1980). Some possible approaches to prevention of eating and body weight/shape disorders, with particular reference to anorexia nervosa. *International Journal of Eating Disorders*, **7**, 1-17.
- Crisp, A. H. (1984). The psychopathology of Anorexia Nervosa: Getting the 'heat' out of the system. In A. J. Stunkard & E. Stellar (Eds.), *Eating and its disorders*. Raven Press: New York.
- Crisp, A.H. (1985). Gastrointestinal disturbance in anorexia-nervosa. *Postgraduate Medical Journal*, **61**, 3-5.
- Crowne, D. P & Marlowe, D (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology*, **24**, 349-354.

- Crowther, J. H., Wolf, E. M., Sherwood, N. E. (1992). Epidemiology of bulimia nervosa. In J. H. Crowther, D. L. Tennenbaum, S. E. Hobfall, & M. A. P. Stephens (Eds.), *The Etiology of Bulimia Nervosa: The Individual and Familiar Contexts*. HPC: USA.
- Dalle Grave, R., Rigamonti, R., Todisco, P., & Oliosi, E. (1996). Dissociation and traumatic experiences in eating disorders. *European Eating Disorders Review*, **4**, 232-240.
- Davis, C. (1990). Weight and diet preoccupation and addictiveness : the role of exercise. *Personality and Individual Differences*, **11**, 823-827.
- Davis, C., Shapiro, C.M., Elliott, S., & Dionne, M. (1993). Personality and other correlates of dietary restraint: an age by sex comparison. *Personality and Individual Differences*, **14**, 297-30.
- deGroh, M. (1992). Correlates of hypnotic susceptibility. In E. From & M. Nash (Eds.), *Hypnosis: Research developments and perspectives*. Guilford Press: New York.
- Demitrak, M. A., Putnam, F. W., Brewerton, T. D., Brandt, H. A., Gold, P. W. (1990). Relation of clinical variables to dissociative phenomena in eating disorders. *American Journal of Psychiatry*, **147**, 1184-1187.
- Demitrak, M. A., Putnam, F. W., Folsom, V. W., & Krahn, D. D. (1991). Reply to Goldner, Corhill, Bakan, & Birmingham. *American Journal of Psychiatry*, **148**, 1275.
- Dubester, K.A., & Braun, B.G. (1995). Psychometric properties of the dissociative experiences scale. *Journal of Nervous and Mental Disease*, **183**, 231-235.
- Eagly, A.H., Ashmore, R.D., Makhijani, M.G. & Longo, L.G. (1991). What is beautiful is good, but...:A meta-analytic review of research on the physical attractiveness stereotype. *Psychological Bulletin*, **110**, 109-128.
- Eisler, I. (1995). Family models of eating disorders. In G. Szumukler, C. Dare, & J. Treasure (eds), *Handbook of eating disorders: Theory, treatment, and research*. Wiley & Sons: England
- Eldredge, K. (1993). Investigating the sources of dietary counter-regulation: The effects of self-esteem and current dieting. *International Journal of Eating Disorders*, **13**, 57-67.
- Everill, J., Waller, G., & MacDonald, W. (1995). Dissociation in bulimic and non-eating disordered women. *International Journal of Eating Disorders*, **17**, 127-134.
- Fairburn, C. G. & Cooper (1982). Self-Induced vomiting and bulimia nervosa: An undetected problem. *British Medical Journal*, **284**, 1153-1155.
- Fairburn, C. G., Marcus, M. D., & Wilson, G. T. (1993). Cognitive-behavioural therapy for binge eating and bulimia nervosa: A comprehensive treatment manual. In C. G. Fairburn & G. T. Wilson (Eds.), *Binge eating: Nature assessment and treatment*. Guilford Press: New York.

- Fairburn, C. G., Cooper, Z., & Cooper, P.J. (1986). The clinical features and maintenance of bulimia nervosa. In K.D Brownell & J. P. Foreyt (eds), *Physiology, psychology, and treatment of the eating disorders*. Basic Books: New York.
- Fairburn, C. G., Cooper, P. J., Cooper, M. J., McKenna, F. P., & Anastasiades, P. (1991). Selective information processing in bulimia nervosa. *International Journal of Eating Disorders*, **13**, 391-397.
- Faith, M. & Ray, W.J. (1994). Hypnotizability and dissociation in a college-age population: orthogonal individual-differences. *Personality and Individual Differences*, **17**, 211-216.
- Favoro, A. & Santonastaso, P. (1995). Dissociative experiences, trauma and eating disorders in a female college sample. *European Eating Disorders Review*, **3**, 196-200.
- Feingold, A. (1992). Good-looking people are not what we think. *Psychological Bulletin*, **111**, 304-341.
- Fichter, M. M. (1990). Bulimia Nervosa and bulimic behaviour. In M. M. Fichter (Ed.), *Bulimia Nervosa: Basic research, diagnosis, and therapy*. Wiley: England.
- Fillmore, M. T. & Vogel-Sprot, M. (1994). Psychomotor performance under alcohol and under caffeine: Expectancy and pharmacological effects. *Experimental and Clinical Psychopharmacology*, **2**, 319-327.
- Fischer, D.G., & Elnitsky, S. (1990). A factor analytic study of 2 scales measuring dissociation. *American Journal of Clinical Hypnosis*, **32**, 201-207.
- Francis, W.N., & Kucera, H. (1982). *Frequency Analysis and usage: Lexicon and Grammar*. Houghton & Mifflin: New York.
- Frankel, F.H. (1990). Hypnotizability and dissociation. *American Journal of Psychiatry*, **147**, 823-829.
- Frankel, F.H. (1991). Hypnotizability and dissociation – reply. *American Journal of Psychiatry*, **148**, 1105-1106.
- Frasquilho, F., & Oakley, D. (1997). Hypnotizability, dissociation, and three factors of eating behaviour. *Contemporary Hypnosis*, **14**, 105-112.
- French, S.A., & Jeffery, R.W. (1994). Consequences of dieting to lose weight: effects on physical and mental-health. *Health Psychology*, **13**, 195-212.
- Frischholz, E. J., Braun, B. G., Sachs, R. G., Schwartz, D. R., Lewis, J., Shaeffer, D., Westergaard, C., and Pasquotto, J. (1991). Construct validity of the dissociative experiences scale (DES): I. The relationship between the DES and other self report measures of dissociation. *Dissociation*, **4**, 185-188.
- Frischholz, E.J., Braun, B.G., Sachs, R.G., Schwartz, D.R., Lewis, J., Schaeffer, D.M., Westergaard, C., & Pasquotto, J. (1992). Construct validity of the

- Dissociative Experiences Scale: The relation between the DES and hypnotizability. *American Journal of Clinical Hypnosis*, **35**, 145-152.
- Frischholz, E. J., Lipman, L. S., Braun, B. G., Sachs, R. G. (1992). Psychopathology, hypnotizability, and dissociation. *American Journal of Psychiatry*, **149**, 1521-1525.
- Frischholz, E.J., Braun, B.G., Sachs, R.G., Hopkins, L., Schaeffer, D.M., Lewis, J., Leavitt, F., & Pasquotto, M.A., & Schwartz, D.R., (1990). The Dissociative Experiences Scale: Further replication and validation, *Dissociation*, **3**, 151-153
- Frost, R.O., Goolkasian, G.A., Ely, R.J., & Blanchard, F.A. (1982). Depression, restraint and eating behavior. *Behaviour Research and Therapy*, **20**, 113-121.
- Ganley, R.M. (1988). Emotional eating and how it relates to dietary restraint, disinhibition, and perceived hunger. *International Journal of Eating Disorders*, **7**, 635-647.
- Garner, D. M. (1991). *The Eating Disorders Inventory –2: Professional Manual*. Psychological Assessment Resources: Florida.
- Garner, D. M. & Garfinkel, P. E. (1979). The Eating Attitudes Test: An index of the symptoms of anorexia nervosa. *Psychological Medicine*, **9**, 273-279.
- Garner, D. M. & Garfinkel, P. E. (1980). Socio-cultural factors in the development of anorexia nervosa. *Psychological Medicine*, **10**, 657-284.)
- Garner, D.M., Garfinkel, P.E., & Olmsted, M.P. (1983). An overview of sociocultural factors in the development of anorexia nervosa. In P.L Darby, P.E. Garfinkel, D.M. Garner, & D.V. Coscina (eds.), *Anorexia nervosa: Recent developments in research* (pp.83-94). Alan R. Liss: New York.
- Garner, D. M., Olmstead, M. P., & Polivy, J. (1983). The Eating Disorders Inventory: A measure of the cognitive-behavioral dimensions of anorexia nervosa and bulimia. In P. L. Darby, P. E. Garfinkel, D. M. Garner, & D. V. Coscina (Eds.), *Neurology and neurobiology (Vol. 3)*. Alan R. Liss, Inc.: New York.
- Garner, D.M., Garfinkel, P.E., Schwartz D., & Thompson, M. (1980). Cultural expectations of thinness in women. *Psychological Reports*, **47**, 483-491.
- Gheorghiu, V.A. (1989). The difficulty in explaining suggestion: Some conceivable solutions. In V.A. Gheorghiu, P. Netter, H.J. Eysenck, & R. Rosenthal (eds.), *Suggestion and suggestibility: Theory and Research*, (pp99-112). Springer-Verlag: Berlin.
- Gillen, B. (1981). Physical attractiveness: A determinant of two types of goodness. *Personality and Social Psychology Bulletin*, **7**, 227-281.
- Goldner, E. M., Corkhill, L. A., Bakan, R., & Birmingham, L. A. (1991). Letter to editor: Dissociative experiences and eating disorders. *American Journal of Psychiatry*, **148**, 1274-1275.

- Goldfarb, L. A., Dykens, E. M., & Gerrard, M. (1985). The Goldfarb Fear of Fat Scale. *Journal of Personality Assessment*, **49**, 329-333.
- Gorman B. S. Allison, D. B. (1995). Measures of Restrained Eating. In D. B. Allison (Ed.), *Handbook of assessment methods for eating behaviors and weight-related problems: Measures, theory, and research*. (pp. 149-184). Thousand Oaks, CA, USA: Sage Publications
- Gorman, B.S., Allison, D.B., & Primavera, L.H. (1993). *The scalability of items of the Three-Factor Eating Questionnaire Restraint Scale: When is a personality scale a "scale"?* : Arlington, VA: Eastern Psychological Association Convention. April.
- Green, B.L., & Saenz, D.S. (1995). Tests of a mediational model of restrained eating: the role of dieting, self-efficacy and social comparisons. *Journal of Social and Clinical Psychology*, **14**, 1-22.
- Green, J.P., & Lynn, S.J. (1995). Hypnosis, dissociation, and simultaneous task performance. *Journal of Personality and Social Psychology*, **69**, 728-735.
- Green, M.W., & Rogers, P.J. (1993). Selective attention to food and body shape words in dieters and restrained non-dieters. *International Journal of Eating Disorders*, **14**, 515-517.
- Greeno, C. G. & Wing, R. R. (1992). Stress induced eating. *Psychological Bulletin*, **115**, 444-464.
- Griffiths, R. A. & Channon-Little, L. (1993). The hypnotizability of patients with bulimia nervosa and partial syndromes participating in a controlled treatment outcome study. *Contemporary Hypnosis*, **10**, 81-87.
- Grilo, C.M., Shiffman, S., & Wing, R.R. (1989). Relapse crises and coping among dieters. *Journal of Consulting and Clinical Psychology*, **57**, 488-495.
- Grossman, S. P. (1990). Brain mechanisms concerned with food intake and body weight regulation. In M.M. Fichter, *Bulimia Nervosa: Basic research, diagnosis, and therapy*. Wiley: London.
- Groth-Marnat, G. (1991). Hypnotizability, suggestibility, and psychopathology: An overview of research. In J. F. Schumaker (ed.), *Human Suggestibility: Advances in theory, research, and application*. Routledge: London.
- Groth-Marnat, G. & Schumaker, J. F. (1990). Hypnotizability, attitudes towards eating, and concern with body size in a female college population. *American Journal of Clinical Hypnosis*, **32**, 194-200.
- Hamilton, L. H., Brooks-Gunn, J., & Warren, M.P. (1985). Sociocultural influences on eating disorders in professional female ballet dancers. *International Journal of Eating Disorders*, **4**, 465-477.
- Hart, K.J., & Ollendick, T.H. (1985). Prevalence of bulimia in working and university women. *American Journal of Psychiatry*, **142**, 851-854.

- Heatherton, T. H., & Baumeister, R. R. (1991). Binge eating as an escape from self-awareness. *Psychological Bulletin*, **110**, 86-108.
- Heatherton, T.F., Herman, C.P., & Polivy, J. (1991). Effects of physical threat and ego threat on eating behaviour. *Journal of Personality and Social Psychology*, **60**, 138-143.
- Heatherton, T.F., Herman, C.P., & Polivy, J. (1992). Effects of distress on eating: The importance of ego threat. *Journal of Personality and Social Psychology*, **62**, 801-803.
- Heatherton, T.F., Polivy, J., & Herman, C.P. (1989). Restraint and internal responsiveness: effects of placebo manipulations of hunger state on eating. *Journal of Abnormal Psychology*, **98**, 89-92.
- Heatherton, T.F., Herman, C.P., Polivy, J., King, G.A., & McGree, S.T. (1988). The (mis)measurement of restraint: An analysis of conceptual and psychometric issues. *Journal of Abnormal Psychology*, **97**, 19-28.
- Heatherington, M. M. & Rolls, B. J. (1991). Eating behaviours in eating disorders: Response to preloads. *Physiology and Behaviour*, **50**, 101-108.
- Heatherton, T. F. & Polivy, J. (1994). Chronic dieting and eating disorders: A spiral model. In J. H. Crowther, D. L. Tennenbaum, S. E. Hobfall, & M. A. P. Stephens (Eds.), *The Etiology of Bulimia Nervosa: The Individual and Familiar Contexts*. HPC: USA.
- Helman, C. G. (1998). *Culture, health, and Illness (Third Edition)*. Butterworth-Heinemann: Oxford.
- Heilman, M.E., & Saruwatari, L.R. (1979). When beauty is beastly: The effects of appearance and sex on evaluations of job applicants for managerial and nonmanagerial jobs. *Organizational Behavior and Human Performance*, **23**, 360-372.
- Herman, C.P., & Mack, D. (1975). Restrained and unrestrained eating. *Journal of Personality*, **143**,
- Herman, C.P., & Polivy, J. (1975). Anxiety, restraint, & eating behaviour. *Journal of Abnormal Psychology*, **84**, 666-672.
- Herman, C.P., & Polivy, J. (1980). Restrained eating. In A.J. Stunkard (Ed.), *Obesity* (pp.208-225). Saunders: Philadelphia.
- Herman, C. P.& Polivy, J. (1984). A boundary Model for the regulation of eating. In A. J. Stunkard & E. Stellar, (eds.) *Eating and its disorders*. Raven Press: New York.
- Herman, C.P., & Polivy, J. (1988). Studies of eating in normal dieters. In B.T. Walsh (ed.), *Eating behaviour in eating disorders*. American Psychiatric Association Press: Washington, DC.

- Herman, C.P., Polivy, J., Lank, C.N., & Heatherton, T.F. (1987). Anxiety, hunger, and eating behavior. *Journal of Abnormal Psychology*, **96**, 264-269.
- Herman, C. P., Polivy, J., & Silver, R. (1979). The effects of an observer on eating behaviours: The induction of sensible eating. *Journal of Personality*, **47**, 85-99.
- Hibscher, C. P. & Herman, J.A. (1977). Obesity, dieting, and the expression of obese characteristics. *Journal of Comparative and Physiological Psychology*, **91**, 374-380.
- Hilgard, E.R. (1965). *Hypnotic Susceptibility*. Harcourt, Brace and World: New York.
- Hilgard, E.R. (1973). The domain of hypnosis. *American Psychologist*, **28**, 972-82.
- Hilgard, E.R. (1977). *Divided Consciousness: Multiple controls in human thought and action*. Wiley-Interscience: New York.
- Hilgard, E.R., Hilgard, J., Macdonald, H., Morgan, A. H., & Johnson, L. S. (1978). Covert pain in hypnotic analgesia: Its reality as tested by the real simulator design. *Journal of Abnormal Psychology*, **87**, 655-663.
- Hilgard, E.R., Sheehan, P.W., Monteiro, K.P., & MacDonald, H. (1981). Factorial structure of the creative imagination scale as a measure of hypnotic responsiveness: an international comparative study. *International Journal of Clinical and Experimental Hypnosis*, **29**, 66-76.
- Hofland, K., & Johansson, S. (1982). *Word frequencies in British and American English*. Longman: Harlow.
- Hsu, L. K. G. (1990). *Eating disorders*. Guilford Press: New York.
- Huenemann, R. L., Shapiro, L. R., Hamptom, M. C., & Mitchell, B. W. (1966). A longitudinal study of gross body weight composition and body conformation and their association with food and activity in a teenage population. *American Journal of Clinical Nutrition*, **18**, 325-338.
- Hyland, M.E., Irvine, S.H., Thaker, C., Dann, P.L., & Dennis, I. (1989). Psychometric analysis of the Stunkard-Messick Eating Questionnaire (SMEQ) and comparison with the Dutch Eating Behaviour Questionnaire (DEBQ). *Current Psychology Research and Reviews*, **8**, 228-233.
- James, W. (1890). *The Principles of Psychology*. Holt: New York.
- Jansen, A., Merckelbach, H., Tuiten, A., & van der Hout, M. (1988). Cognitions and self-talk during food-intake of restrained and unrestrained eaters. *Behaviour Research and Therapy*, **26**, 393-398.
- Jöreskog & Sörbom, (1986). *LISREL (Linear Structural Relations)*. University of Chicago.
- Kaffman, M. (1992). Monoideastic disorders and the process of suggestion: Anorexia Nervosa as a paradigm. In J.F. Schumaker (ed.), *Human Suggestibility: Advances in theory, research, and application*. Routledge: London.

- Kiddoo, K. P. (1977). *Personality, cognitive style, and imagination related behaviors*. Paper presented at Annual Meeting of the American Psychological Association. San Francisco, August 29.
- Kihlström, J.F. (1985). Hypnosis. *Annual Review of Psychology*, **36**, 385-418.
- King, M. B., & Mezey, G. (1987). Eating behaviour of male racing jockeys. *Psychological Medicine*, **17**, 249-253.
- Kirsch, I. (1991). The placebo effect as a conditioned response: failures of the litmus test. *Behavioral and Brain Sciences*, **14**, 200-203.
- Kirsch, I. (1992). The state of the altered state debate. *Contemporary Hypnosis*, **9**, 1-6.
- Kirsch, I. (1997). Suggestibility or hypnosis: What do our scales really measure? *International Journal of Clinical and Experimental Hypnosis*, **45**, 212-225.
- Kirsch, I., Comey, G., Reed, S., & Silva, S.E. (1995). A spectral-analysis of cognitive and personality-variables in hypnosis: empirical disconfirmation of the 2-factor model of hypnotic responding. *Journal of Personality and Social Psychology*, **69**, 167-175.
- Kirsch, I., & Lynn, S.J. (1995). The altered state of hypnosis: changes in the theoretical landscape. *American Psychologist*, **50**, 846-858.
- Kirsch, I., & Lynn, S.J. (1998). Dissociation theories of Hypnosis. *Psychological Bulletin*, **123**, 100-115.
- Kirschenbaum, D.S., & Tomarken, A.J. (1982). Some antecedents of regulatory eating by restrained and unrestrained eaters. *Journal of Abnormal Psychology*, **91**, 326-336.
- Kirschenbaum, D.S., & Dykman, B.M. (1991). Disinhibited eating by resourceful restrained eaters. *Journal of Abnormal Psychology*, **100**, 227-230.
- Klem, M.L., Klesges, R.C., Bene, C.R., & Shadish, W. (1990). *Application of confirmatory factor analysis to the dietary restraint scale*. Paper presented to the Association for the Advancement of Behaviour Therapy, San Francisco. November, 1990.
- Knight, L. J. & Boland F. J. (1989). Restrained Eating: An Experimental disentanglement of the disinhibiting variables of perceived calories and food type. *Journal of Abnormal Psychology*, **98**, 412-420.
- Knox, V. J., Crutchfield, L., & Hilgard, E. R. (1975). The nature of task interference in hypnotic dissociation: An investigation of hypnotic behavior. *International Journal of Clinical and Experimental Hypnosis*, **23**, 305-323.
- Kranhold, C., Baumann, U., & Fichter, M. (1992). Hypnotizability in Bulimic Patient and controls: A pilot study. *European Archives of Psychiatry and Clinical Neuroscience*, **242**, 72-76.



- Kucera, H. & Francis, W. (1967). *A computational Analysis of present day English*. Brown University Books: Providence.
- Laessle, R. G., Tuschl, R., J., Kotthaus, B. C., & Pirke, K. M. (1989). A comparison of the validity of three scales for the assessment of dietary restraint. *Journal of Abnormal Psychology*, 98, 4, 504-507.
- Laidlow, T. M., & Large, R. G. (1997). Harvard Group Scale of Hypnotic Susceptibility and the Creative Imagination Scale: Defining two separate but correlated abilities. *Contemporary Hypnosis*, 14, 26-37.
- Lerne, R. M. & Karabenick, S. A. (1974). Physical attractiveness, body attitudes, and self-concept in late adolescence. *Journal of Youth and Adolescence*, 3, 307-316.
- Leung, N.W, Waller, G., Thompson, G. (1999). Core beliefs in anorexic and bulimic women. *The Journal of Nervous and Mental Disease*, 187, 736-741.
- Leung, N.W., Geller, J., & Katzman, M. (1996). Issues and concerns associated with different risk models for eating disorders. *International Journal of Eating Disorders*, 19, 249-256.
- Logue, A. W. (1998). *The psychology of eating and drinking (2<sup>nd</sup> edition)*. Freeman: New York.
- Logue, A.W. & King, G.R. (1991). Self-control and impulsiveness in adult humans when food is the Reinforcer. *Appetite*, 17, 105-120
- Long, T. E. (1968). Some early-life stimulus correlates of hypnotizability. *International Journal of Clinical and Experimental Hypnosis*, 16, 61-67.
- Lowe, M.R. (1993). The effects of dieting on eating behaviour: A three-factor model. *Psychological Bulletin*, 114, 100-121.
- Lowe, M.R. (1995) Restrained Eating And Dieting - Replication Of Their Divergent Effects On Eating Regulation. *Appetite*, 25, 115-118
- Lowe, M. R., Gleaves, D. H., DiSimone-Weiss, R., Furgueson, C., Gayda, C. A., Kolsky, P. A., Neal-Walden, T., Nelson, L. A., & McKinney, S. (1996). Restraint, dieting, and the continuum model of bulimia nervosa. *Journal of Abnormal Psychology*, 105, 508-517.
- Lowe, M. R., Gleaves, D. H., & Murphy-Eberenz, K. P. (1988). On the relation of dieting and bingeing in bulimia nervosa. *Journal of Abnormal Psychology*, 107, 263-272.
- Lowe, M.R., & Maycock, B. (1988). Restraint, disinhibition, hunger and negative affect eating. *Addictive Behaviors*, 3, 369-377.
- Lowe, M., R., Whitlow, J. W., Bellwoar, V. (1991). Eating Regulation - The Role Of Restraint, Dieting, And Weight. *International Journal Of Eating Disorders*, 10, 461-471

- Lovell, D.M., Williams, J.M.G., & Hill, A.B. (1997). Selective processing of shape-related words in women with eating disorders, and those who have recovered. *British Journal Of Clinical Psychology*, **36**, 421- 432
- Ludwig, A. M. (1983). The psychobiological functions of dissociation. *American Journal of Clinical Hypnosis*, **26**, 93-99.
- Mare, C., Lynn, S. J., Kvaal, S., Segal, D., & Sivec, H. (1994). Hypnosis and the dream hidden observer: Primary Process and demand characteristics. *Journal of Abnormal Psychology*, **103**, 316-327.
- Mazur, A. (1986). The Physical Attractiveness Phenomena. *Contemporary Sociology-A Journal Of Reviews*, **15**, 481-491
- McCallum, K. E., Lock, J., Kulla, M., Rorty, M., & Wetzel, R. D. (1992). Dissociative symptoms and disorders in patients with eating disorders. *Dissociation*, **4**, 227-235.
- McConkey, K.M., Sheenan, P.W., & Law, H.G. (1980). Structural analysis of the Harvard Group Scales of Hypnotic Susceptibility, Form A. *International Journal of Clinical and Experimental Hypnosis*, **28**, 164-175.
- McConkey, K. M., Sheehan, P. W., Law, H. G., & White, D. K. (1977). *Structural analysis of the creative imagination scale*. University of Queensland: St. Lucia.
- McDonald, R.P. & Ahlawat, K.S. (1974). Difficulty factors in binary data. *British Journal of Mathematical and Statistical Psychology*, **27**, 82-99.
- McGuire, W. J. (1989). A mediational theory of susceptibility to social influence. In V.A. Gheorgiu, P. Netter, H.J. Eysenck, & R. Rosenthal (eds.), *Suggestion and suggestibility: Theory and Research*, (pp99-112). Springer-Verlag: Berlin.
- McManus, F. (1995). Dissociation and the Severity of Bulimic Psychopathology among Eating-Disordered and Non-Eating Disordered Women. *European Eating Disorders Review*, **3**, 185-195.
- Miller, M.E., & Bowers, K.S. (1986). Hypnotic analgesia and stress inoculation in the reduction of pain. *Journal of Abnormal Psychology*, **95**, 6-14.
- Miller, M.E., & Bowers, K.S. (1993). Hypnotic analgesia: Dissociated experience or dissociated control. *Journal of Abnormal Psychology*, **102**, 29-38.
- Morgan, A. H. & Hilgard, J. R. (1975). The Stanford hypnotic clinical scale. In E. R. Hilgard (Ed.), *Hypnosis in the Relief of Pain*. William Kaufmann. Los Altos, CA.
- Morris, A., Cooper, T., & Cooper, P.J. (1989). The Changing Shape Of Female Fashion Models. *International Journal Of Eating Disorders*, **8**, 593-596.
- Muthén, B. (1978). Contributions to factor analysis of dichotomous variables. *Psychometrika*, **43**, 551-560.

- Muthén, B. (1984). A general structural equation model with dichotomous, ordered categorical and continuous latent variable indicators. *Psychometrika*, **49**, 115-132.
- Nadon, R. (1997). What This Field Needs Is A Good Nomological Network. *International Journal of Clinical and Experimental Hypnosis*, **45**, 314-323
- Nadon, R., Kihlstrom, J.F., Hoyt, I.P. & Register, P.A. (1991). Absorption And Hypnotizability - Context Effects Re-examined. *Journal Of Personality And Social Psychology*, **60**, 144-153.
- Nemiah, J. C. (1989). Dissociative disorders (hysterical neuroses, dissociative type). In H. I. Kaplan, A. M. Freedman, B. J. Saddock (Eds.), *Comprehensive textbook of psychiatry, 5th Edition*. Williams & Wilkins: Baltimore, USA.
- Nisbett, R. E. (1968). Taste, deprivation, and weight determinants of eating behaviour. *Journal of Personality and Social psychology*, **10**, 107-116.
- Nisbett, R.E. (1972). Hunger, obesity, and the ventro-medial hypothalamus. *Psychological Review*, **79**, 433-453.
- Nisbett, R.E., & Wilson, T.D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, **84**, 231-259.
- Nogrady, H., McConkey, K.M., Laurence, J.R., & Perry, C. (1983). Dissociation, duality, and demand characteristics in hypnosis. *Journal of Abnormal Psychology*, **92**, 223-235.
- Norman, D. A., & Shallice, T. (1986). Attention to action: Willed and automatic control of behaviour. In R. J. Davidson, G. E. Schwartz, & D. Shapiro (eds.), *Consciousness and self-regulation* (Vol. 4). Plenum Press: New York.
- Nylander, I. (1971). The feeling of being fat and dieting in a school population: Epidemiological interview investigation. *Acta Sociomedica Scandiavica*, **3**, 17-26.
- Ogden, J. (1993). The measurement of restraint: Confounding success and failure? *International Journal of Eating Disorders*, **13**, 69-76.
- O'Mally, P. M., & Bachman, J. G. (1979). Self-esteem and education: Sex and cohort comparisons among high school seniors. *Journal of Personality and Social Psychology*, **37**, 1153-1159.
- Orne, M. (1962). On the social psychology of the psychological experiment: With particular reference to demand characteristics and their implications. *American Psychologist*, **17**, 776-783.
- Pedahazur, E. J. (1982). *Multiple regression in behavioural research: Explanation and prediction (2<sup>nd</sup> Edition)*. Holt, Rhine hart & Winston: New York.
- Perpiñá, C., Hemsley, D., Treasure, & de Silva, P (1993). Is The Selective Information-Processing Of Food And Body Words Specific To Patients With Eating Disorders. *International Journal Of Eating Disorders*, **14**, 359-366.

- Peter, J. E., Dhanens, T. P., Lundy, R. M., & Landy, F. J. (1974). A factor Analytic investigation of the Harvard Group Scale of Hypnotic Susceptibility: Form A. *International Journal of Clinical and Experimental Hypnosis*, **22**, 377-387.
- Pettinati, H. M., Horne, R. L., & Staats, J. M. (1985). Hypnotizability in patients with anorexia and bulimia. *Archives of General Psychiatry*, **42**, 1014-1016.
- Pettinati, H. M., Kogan, L. G., Margolis, C., Shrier, L., & Wade, J. H. (1989). Hypnosis, hypnotizability, and the bulimic patient. In L. M. Hornyak & E. K. Baker (Eds.), *Experimental Therapies for Eating Disorders*, 34-59. Guilford Press: New York.
- Pirke, K.M. (1989). A comparison of the validity of three scales for the assessment of dietary restraint. *Journal of Abnormal Psychology*, **98**, 304-307.
- Polivy, J. (1976). Caloric perception and regulation of food intake in restrained and non-restrained eaters. *Addictive Behaviours*, **1**, 237-243.
- Polivy, J. & Herman, C.P. (1976a). Effects of alcohol on weight change: Influences of mood and perceived intoxication. *Journal of Abnormal and Social Psychology*, **83**, 601-606.
- Polivy, J. & Herman, C.P. (1976b). Clinical depression and weight change: A complex relation. *Journal of Abnormal and Social Psychology*, **85**, 338-340.
- Polivy, J. & Herman, P. (1985). Dieting and bingeing: A causal analysis. *American Psychologist*, **40**, 193-201.
- Polivy, J. & Herman, C.P. (1987). Diagnosis and treatment of normal eating. *Journal of Consulting and Clinical Psychology*, **55**, 635-644.
- Polivy, J., Herman, C.P., Hackett, R., Kuleshnyk, I. (1986) The Effects Of Self-Attention And Public Attention On Eating In Restrained And Unrestrained Subjects. *Journal Of Personality And Social Psychology*, **50**, 1253-1260
- Polivy, J., Herman, C.P., & Howard, K.I. (1988). Restraint Scale: Assessment of dieting. In M. Hersen & A.S. Bellack (Eds), *Dictionary of behavioral assessment techniques* (377-380). Pergamon: New York.
- Polivy, J., Herman, C.P., Mcfarlane, T. (1994). Effects Of Anxiety On Eating - Does Palatability Moderate Distress- Induced Overeating In Dieters. *Journal Of Abnormal Psychology*, **103**, 505-510.
- Polivy, J., Herman, C. P., & Warsh, S. (1978). Internal and external components of emotionality in restrained and unrestrained eaters. *Journal of Abnormal Psychology*, **87**, 497-504.
- Polivy, J., Herman, C. P., Younger, J. C., & Erskine, B. (1986). The effects of a model on eating behaviour: Then induction of a restrained eating style. *Journal of Personality*, **47**, 100-117.

- Ray, W. (1997). EEG concomitants of hypnotic susceptibility. *International Journal Of Clinical And Experimental Hypnosis*, **45**, 3, Pp.301-313
- Ray, W.J., June, K., Turaj, K., Lundy, R. (1992). Dissociative Experiences In A College Age Population - A Factor Analytic Study Of 2 Dissociation Scales. *Personality And Individual Differences*, **13**, 417-424.
- Reed, D.L., Thompson, J.K., Brannick, M.T. & Sacco, W.P. (1991). Development And Validation Of The Physical Appearance State And Trait Anxiety Scale (Pastas). *Journal Of Anxiety Disorders*, **5**, 323-332.
- Ricciardelli, L.A., Tate, D. & Williams, R.J. (1997). Body dissatisfaction as a mediator of the relationship between dietary restraint and bulimic eating patterns. *Appetite*, **29**, No.1, pp.43-54
- Rogers, P.J. & Green M.W. (1993). Selective Attention To Food And Body Shape Words In Dieters And Restrained Non-dieters. *International Journal Of Eating Disorders*, **14**, 515-517.
- Root, M. P. P., & Fallon, P. (1989). The incidence of victimisation experiences in a bulimic sample. *Journal of Interpersonal Violence*, **3**, 161-173.
- Rosen, E. F. & Petty, L. C. (1994). Dissociative states and disordered eating. *American Journal of Clinical Hypnosis*, **36**, 266-275.
- Ross, C. A., Heber, S., Norton, G. R., Anderson, D., Anderson, G., & Barchet, P. (1989). The Dissociative Disorders Interview Schedule: A structured interview. *Dissociation*, **2**, 169-189.
- Ross, C. A., Joshi, S., & Currie, R. (1990). Dissociative experiences in the general population. *American Journal of Psychiatry*, **147**, 1547-1552.
- Ross, C. A., Joshi, S., & Currie, R. (1991). Dissociative experiences in the general population: Identification of three factors. *Hospital and Community Psychiatry*, **42**, 297-301.
- Ross, C. A., Ryan, L., Voight, H., & Eide, L. (1991). High and low dissociators in a college student population. *Dissociation*, **5**, 147-151.
- Ruderman, A.J. (1983). The Restraint Scale: A psychometric investigation. *Behaviour Research and Therapy*, **21**, 258-283.
- Ruderman, A. J. (1985). Restraint and irrational cognitions. *Behaviour Research and Therapy*, **5**, 557-561.
- Ruderman, A.J. (1986). Dietary restraint: A theoretical and empirical review. *Psychological Bulletin*, **99**, 247-262.
- Ruderman, A.J. & Wilson, G.T. (1979). Weight, restraint, cognitions, and counter-regulation. *Behaviour Research and Therapy*, **17**, 581-590

- Ruderman, A.J., & Christiansen, H.C. (1983). Restraint theory and its applicability to overweight individuals. *Journal of Abnormal Psychology*, **92**, 210-215.
- Ruderman, A.J., Belzer, L.J., & Halperin, A. (1985). Restraint, anticipated consumption, and overeating. *Journal of Abnormal Psychology*, **94**, 547-555.
- Russell, G. (1979). Bulimia Nervosa: An ominous variant of anorexia nervosa. *Psychological Medicine*, **9**, 429-448.
- Russell, G. F. M. (1994). The diagnostic status and clinical assessment of bulimia nervosa. In M. M. Fichter (Ed.), *Bulimia Nervosa: Basic research, diagnosis, and therapy*. Wiley: England.
- Ryle, G. (1949). *The Concept of Mind*. Peregrin: England.
- Sanders, S. (1986). The perceptual alteration scale: A scale measuring dissociation. *American Journal of Clinical Hypnosis*, **29**, 95-102.
- Sarbin, T.R., & Coe, W.C. (1972). *Hypnosis: A social psychological analysis of influence communication*. Holt, Rinehart and Winston: New York.
- Savin-Williams, R. (1979). Dominance hierarchies in groups of early adolescents. *Child Development*, **50**, 923-935.
- Schacter, S. (1971). Some extraordinary facts about obese humans and rats. *American Psychologist*, **26**, 129-145.
- Schacter, S., & Rodin, J. (1974). *Obese humans and rats*. Lawrence Erlbaum: USA.
- Schotte, D.E. (1992). On the special status of ego threats: comment. *Journal of Personality and Social Psychology*, **62**, 798-800.
- Schumaker, J. F. (1991b). Editorial. In J. F. Schumaker (Ed.), *Human Suggestibility*. Routledge: London.
- Schumaker, J. F. (1991a). The adaptive value of suggestibility and dissociation. In J. F. Schumaker (Ed.), *Human Suggestibility*. Routledge: London.
- Schumaker, R. E. & Lomax, R. G. (1996). *A beginners guide to structural equation modeling*. LEA: Mahwah, New Jersey.
- Schwartz, D. & Frischholz, E. J. (1991). Confirmatory factor analysis of the Dissociative Experiences Scale. In B. G. Braun & E. B. Carlson (Eds.), *Proceedings of the Eight International Conference on Multiple Personality and Dissociative States*. Rush:Chicago.
- Schwartz, D. M, Thompson, M. G., & Johnson, C. L. (1986). Anorexia Nervosa and Bulimia: The Socio-Cultural context. *International Journal of Eating Disorders*, **1**, 20-38.
- Seddon, L., & Berry, N. (1996). Media-induced disinhibition of dietary restraint. *British Journal of Health Psychology*, **1**, 27-33.

- Seligman, M. E. P. (1975). *Helplessness: On depression, development and death*. W. H. Freeman: San Francisco.
- Shames, M. L. (1981). Hypnotic susceptibility and conformity: On the mediational mechanisms of suggestibility. *Psychological Reports*, **49**, 563-566.
- Sheehan, P. W. (1979). Hypnosis and the process of imagination. In E. Fromm & R. Shor (eds.), *Hypnosis: Development in Research and New Perspectives*. Aldine, New York.
- Sheenan, P. W. & McConkey, K. M. (1982). *Hypnosis and experience: The exploration of phenomena and process*. Lawrence Erlbaum: Hillsdale, NJ.
- Sheenan, P. W., McConkey, K. M., & Law, H. G. (1978). Imagery facilitation and performance on the creative imagination scale. *Journal of Mental Imagery*, **26**, 294-304.
- Shor, R. E. & Orne, E.C (1962). *Harvard Group Scale of Hypnotic Susceptibility: Form A*. Consulting Psychologists Press: Palo Alto, California.
- Shor, R. E. & Orne, E.C (1963). Norms on the Harvard Group Scale of Hypnotic Susceptibility: Form A. *International Journal of Clinical and Experimental Hypnosis*, **11**, 39-47.
- Shor, R.E., Orne, M.T., & O'Connell, D.N. (1962). Validation and cross validation of a scale of self-reported personal experiences which predicts hypnotizability. *Journal of Psychology*, **53**, 55-75.
- Silverstein, B., Perdue, L., Peterson, B., & Kelly, E. (1986). The role of the mass media in promoting a thin standard of bodily attractiveness for women. *Sex Roles*, **14**, 519-532.
- Simmons, R. G. & Rosenberg, F. (1975). Sex, sex roles, and image. *Journal of Youth and Adolescence*, **4**, 229-258.
- Slade, P. (1982). Towards a functional analysis of anorexia nervosa and bulimia nervosa. *British Journal of Clinical Psychology*, **21**, 167-179.
- Smith, M. & Thelen, M. H. (1984). Development and validation of a test for bulimia. *Journal of Consulting and Clinical Psychology*, **52**, 863-872.
- Szumukler, G. I., Eilser, I., Gillies, C., & Hayward, M. E. (1985). The implications of anorexia in ballet school. *Journal of Psychiatric Research*, **19**, 177-181.
- Snow, J.T. & Harris, M.B. (1986). An analysis of diet and content in five womens interests magazines. *The Journal of Obesity and Weight Regulation*, **5**, 194-214.
- Spanos, N. P. (1982). A social psychological approach to hypnotic behavior. In G. Weary & H. L. Mirels (eds.), *Integration of clinical and social psychology*. OUP: New York.

- Spanos, N. P. (1986). Hypnotic behavior: A social-psychological interpretation of amnesia and trance logic. *The Behavioural and Brain Sciences*, *9*, 449-502.
- Spanos, N. P. (1991). A sociocognitive approach to hypnosis. In S. J. Lynn, & W. Rhue (eds.), *Theories of Hypnosis: Current models and perspectives*. Guilford Press: New York.
- Spanos, N.P., Flynn, D.M., & Gwynn, M.I. (1988). Contextual demands, negative hallucinations, and hidden observer responding: Three hidden observers observed. *British Journal of Experimental and Clinical Hypnosis*, *5*, 5-10.
- Spanos, N.P., Gwynn, M., & Stam, H.J. (1983). Instructional demands and ratings of overt and hidden pain during hypnotic analgesia. *Journal of Abnormal Psychology*, *92*, 479-488.
- Spanos, N. P., Gabora, N. J., Jarrett, L. E., & Gwynn, M. I. (1989). Contextual determinants of hypnotizability and of relationships between hypnotizability scales. *Journal of Personality and Social Psychology*, *57*, 271-278.
- Spencer, J. A. & Fremouw, W. J. (1979). Binge eating as a function of restraint and weight classification. *Journal of Abnormal Psychology*, *88*, 262-267.
- Spiegel, D. (1986). Dissociating damage. *American Journal of Clinical Hypnosis*, *29*, 123-131.
- Spiegel, H. (1973). *Manual for Hypnotic Induction Profile: Eye-Roll Levitation Method (revised edition)*. Soni Medica: New York.
- Spiegel, D. (1990). Hypnosis, dissociation and trauma: Hidden and overt observers. In J.L. Singer (ed.), *Repression and dissociation: Defense mechanisms and personality styles* (pp.121-42). University of Chicago Press: Chicago.
- Steinberg, M., Rounsaville, B., & Cicchetti, D. (1990). The Structured Clinical Interview for DMS-III-R Dissociative Disorders: Preliminary report on a new diagnostic instrument. *American Journal of Psychiatry*, *148*, 1050-1054.
- Stephens, G. C., Prentice-Dunn, S., & Spruill, J. C. (1994). Public self-awareness and success failure feedback as disinhibitors of restrained eating. *Basic Applied Social Psychology*, *15*, 509-521.
- Stevenson, J. H. (1976). The effect of posthypnotic dissociation on the performance of interfering tasks. *Journal of Abnormal Psychology*, *85*, 398-407.
- Stice, E. (1994). Review of the evidence for a socio-cultural model of bulimia nervosa and an exploration of the mechanisms of action. *Clinical Psychological Review*, *14*, 633-661.
- Stice, E., Nemeroff, C., Shaw, H.E. (1996). Test of the dual pathway model of bulimia nervosa: evidence for dietary restraint and affect regulation mechanisms. *Journal of Social and Clinical Psychology*, *15*, 340-363.



- Stice, E., Schupak-Neuberg, E., Shaw, H. E., & Stein, R. I. (1994). The relation of media exposure to eating disorder symptomatology: An examination of mediating mechanisms. *Journal of Abnormal Psychology*, **103**, 836-840.
- Stice, E., Ziemba, C., Margolis, J., & Flick, P. (1996). The dual pathway model differentiates bulimics, sub-clinical bulimics, and controls: Testing the continuity hypothesis. *Behavior Therapy*, **27**, 531-549.
- Striegel-Moore, R. H. (1993). Etiology of binge eating: A developmental Perspective. In C. G. Fairburn & G. T. Wilson, *Binge Eating: Nature, assessment, and treatment*. Guilford Press: New York.
- Striegel-Moore, R. H., McAvay, G., & Rodin, J. (1986). Psychological and behavioural correlates of feeling fat in women. *International Journal of Eating Disorders*, **8**, 499-509.
- Striegel-Moore, R. H., Silverstein, L. R., & Rodin, J. (1986). Towards an understanding of the risk factors for bulimia nervosa. *American Psychologist*, **41**, 246-263.
- Striegel-Moore, R. H., Silberstein, L. R., & Rodin, J. (1993). The social self in bulimia nervosa: Public self-consciousness, social anxiety, and perceived fraudulence. *Journal of Abnormal Psychology*, **102**, 297-303
- Stroop, J. R. (1935). Studies of interference in serial verbal reactions. *Journal of Experimental Psychology*, **18**, 643-662.
- Stunkard, A. J. (1986). Adipositas. In T. von Uexkull, *Psychosomatische Medizin*. Urban & Schwarzenberg: Munich.
- Stunkard, A. J., & Messick, S. (1985). The three-factor eating questionnaire to measure dietary restraint, disinhibition and hunger. *Journal of Psychosomatic Research*, **29**, 71-83.
- Suita, J. (1987). Normative and psychometric characteristics of a Polish version of the Creative Imagination Scale. *International Journal of Clinical and Experimental Hypnosis*, **36**, 51-58.
- Tabachnick, B. G. & Fidell, L. S. (1996). *Using Multivariate Statistics (3<sup>rd</sup> Edition)*. Harper & Collins: USA.
- Tellegen, A. (1979). On measures and conceptions of hypnosis. *The American Journal of Clinical Hypnosis*, **21**, 219-37.
- Tellegen, A., & Atkinson, G. (1976). Openness to absorbing and self-altering experiences ("absorption"), a trait related to hypnotic susceptibility. *Journal of Abnormal Psychology*, **83**, 268-77.
- Thelen, M. H., Farmer, J., Wonderlich, S., & Smith, M. (1991). A revision of the bulimia test: The BULIT-R. *Psychological Assessment*, **3**, 119-124.

- Thompson, D.A., Berg, K.M., & Shatford, L.A. (1987). The heterogeneity of bulimic symptomatology: cognitive and behavioral dimensions. *International Journal of Eating Disorders*, **6**, 215-234.
- Tiggemann, M. (1998). Dietary restraint as a predictor of reported weight-loss and affect. *Psychological Reports*, **75**, 1679-1682.
- Tobin-Richards, M. H., Boxer, A. M., & Peterson, A. C. (1983). The psychological significance of pubertal change. Sex differences in perception of self during adolescence, In J. Brooks-Gunn & A. C. Peterson (Eds.), *Girls at puberty*. Plenum Press: New York..
- Tomarken, A.J., & Kirschenbaum, D.S. (1982). Self-regulatory failure - accentuate the positive. *Journal of Personality and Social Psychology*, **43**, 584-597.
- Tomarken, A. J. & Kirschenbaum, D. S. (1984). Effects of plans for future meals on counterregulatory eating: where have all the unrestrained eaters gone. *Journal of Abnormal Psychology*, **93**, 458-472.
- Torem, M. S. (1986). Dissociative states presenting as an eating disorder. *American Journal of Clinical Hypnosis*, **29**, 137-142.
- Torem, M. S., Egtvedt, B. D., and Curdue, K. J. (1995). The eye-role sign and the PAS dissociation scale. *American Journal of Clinical Hypnosis*, **38**, 122-124.
- Treasure, J., & Campbell, I. C. (1994). The case for biology in the aetiology of anorexia nervosa. *Psychological Medicine*, **24**,3-8.
- Treasure, J., & Holland, A. (1989). Genetic vulnerability to eating disorders: Evidence from twin and family studies. In H. Remschmidt & M.H. Schmidt (eds.), *Child and youth psychiatry: European perspectives*. Hogrefe & Huber: New York.
- Valdiserri, S. & Kihlstrom, J. F. (1995a). Abnormal eating and dissociative experiences. *International Journal of Eating Disorders*, **17**, 373-380.
- Valdiserri, S. & Kihlstrom, J. F. (1995b). Abnormal eating and dissociative experiences: A further study of college women. *International Journal of Eating Disorders*, **18**, 145-150.
- Vallacher, R. R. & Wegner, D. M. (1985). *A theory of action identification*. Lawrence Erlbaum: Hillsdale, NJ.
- Van Strien, T., Frijters, J.E.R., Bergers, G.P.A., & Defares, P.B. (1986). The Dutch Eating Questionnaire (DEBQ) for assessment of restrained, emotional and external eating behavior. *International Journal of Eating Disorders*, **5**, 747-755.
- Vanderlinden, J., Spinhoven, P., Vandereycken, W., & van Dyck, R. (1995). Dissociative and hypnotic experiences in eating disorder patients: An explorative study. *American Journal of Clinical Hypnosis*, **38**, 97-108.

- Vanderlinden, J., Van Dyck, R., & Vandereycken, W. (1993). The Dissociation Questionnaire (DIS-Q): Development and characteristics of a new self-reporting questionnaire. *Clinical Psychology and Psychotherapy*, *1*, 21-28.
- Wagstaff, G. F. (1991). Compliance, belief and semantics in hypnosis: A non-state sociocognitive perspective. In S. J. Lynn & J. W. Rhue (Eds.), *Theories of Hypnosis of Hypnosis: Current Model and Perspectives*. Guilford Press: New York.
- Wagstaff, G. F. (1998). The hypnotic state: Semantics and pragmatics. *Contemporary Hypnosis*, *15*, 182-188
- Waller, G. (1995). Dissociation and the eating disorders. *European Eating Disorders Review*, *3*, 127-128.
- Waller, G., Hamilton, K., & Shaw, J. (1992). Media influences on body size estimation in eating disordered and comparison subjects. *British Review of Bulimia and Anorexia Nervosa*, *6*, 81-87.
- Waller, N.G., Putnam, F.W., & Carlson, E.B. (1996). Types of dissociation and dissociative types: A taxometric analysis of dissociative experiences. *Psychological Methods*, *1*, 300-321.
- Waller, N.G., & Ross, C.A. (1997). The prevalence and biometric structure of pathological dissociation in the general population: taxometric and behavior genetic findings. *Journal of Abnormal Psychology*, *106*, 499-510.
- Walsh, B.T., Kissileff, H.R., Cassidy, S.M., & Dantzig, S. (1989). Eating behavior of women with bulimia. *Archives of General Psychiatry*, 54-58.
- Ward, A., Tiller, J., Treasure, J., & Russell, G. (2000). Eating disorders: Psyche or Soma? *International Journal of Eating Disorders*, *27*, 279-287.
- Wardle, J. (1987). Eating style: A validation study of the Dutch Eating Behavior Questionnaire in normal subjects and women with eating disorders. *Journal of Personality Assessment*, *31*, 161-169.
- Wardle, J. & Beales, S. (1987). Restraint and food intake: An experimental study of eating behaviour patterns in the laboratory and real life. *Behaviour Research and Therapy*, *27*, 179-185.
- Warren, R. E. (1972) Stimulus encoding and memory. *Journal of Experimental Psychology*, *14*, 90-100.
- Weitzenhoffer, A. M. & Hilgard, E. R. (1962). *Stanford Hypnotic Susceptibility Scale: Form C*. Consulting Psychologists Press: Palo Alto, California.
- Weitzenhoffer, A.M., & Hilgard, E.R. (1963). *Stanford Profile Scales of Hypnotic Susceptibility Forms I and II*. Palo Alto, CA: Consulting Psychologists.
- Westenhoffer, J. (1991). Dietary restraint and disinhibition: Is restraint a homogeneous construct? *Appetite*, *15*, 45-55.

- Williams, J.M.G., Mathews, A., & MacLeod, C. (1996). The emotional stroop task and psychopathology. *Psychological Bulletin*, **120**, 3-24.
- Williams, S.S., Michela, J.L., Contento, I.R., Gladis, M.M., & Pierce, N.T. (1996). Restrained eating among adolescents: Dieters are not always bingers and bingers are not always dieters. *Health Psychology*, **15**, 176-184.
- Wilson, S. C. & Barber, T. X. (1978). The Creative Imagination Scale as a measure of hypnotic responsiveness: application to experimental and clinical hypnosis. *American Journal of Clinical Hypnosis*, **20**, 235-249.
- Wiseman, M.A., Gray, J. J., Mosimann, J.E., & Ahrens, A. H. (1992). Cultural expectations of thinness in women: An update. *International Journal of Eating Disorders*, **11**, 85-89.
- Woody, E.Z., (1997). Have the hypnotic susceptibility scales outlived their usefulness? *International Journal of Clinical and Experimental Hypnosis*, **45**, 226-238
- Woody, E. Z. & Bowers, K. S. (1994). A frontal assault on dissociated control. In S. J. Lynn & J. W. Rhue (Eds.), *Dissociation: Clinical and Theoretical Perspectives*. Guilford Press: New York.
- Woody, E.Z., Drugovic, M., Oakman, J.M. (1997). A re-examination of the role of non-hypnotic suggestibility in hypnotic responding. *Journal of Personality and Social Psychology*, **72**, 399-407.
- Wooley, S. C., & Wooley, O. W. (1985). Intensive outpatient and residential treatment for Bulimia. In D. M. Garner & P. Garfinkel (Eds.), *Handbook of psychotherapy for anorexia and bulimia*. Guilford Press: New York.
- Wybraniec, A. & Oakley, D. (1996). Dietary restraint, hypnotizability and body image. *Contemporary Hypnosis*, **13**, 150-157.

## **APPENDIX A - MEASURES AND QUESTIONNAIRES**

### **A) Three Factor Eating Questionnaire**

(Stunkard & Messick, 1985):

Studies 1, 2, 3, and 4.

### **B) Total Revised Restraint Scale with concern for dieting and weight fluctuation sub-scales.**

(Herman & Polivy, 1980)

Studies 3, and 4.

### **C) Revised Restraint Scale Concern for Dieting Sub-Scale**

(Herman & Polivy, 1980)

Studies 1 and 2.

### **D) Physical Appearance State/Trait Anxiety Scale**

(Reed, et al. 1991).

Study 1.

### **E) Goldfarb Fear of Fat Scale**

(Goldfarb et al, 1986)

Studies 3, and 4.

### **F) Eating Disorder Inventory drive for thinness, body dissatisfaction, and bulimia sub-scales**

(Garner, 1991):

Studies 3 and 4.

### **G) Participant and Dietary Demographic Questionnaire:**

Studies 1, 2, 3, and 4.

### **H) Dissociative Experiences Scale II**

(Carlson & Putnum, 1993): Size reduced to 85% for inclusion into thesis.

Studies 1, 2, 3, and 4.

### **I) Perceptual Alteration Scale** Size reduced to 85% for inclusion into thesis

(Sanders, 1986): Size reduced to 85% for inclusion into thesis.

Studies 1, 2, 3, and 4.

### **J) Social Desirability Scale**

(SDS: Crowne & Marlowe, 1960): Size reduced to 85% for inclusion into thesis.

Studies 2, 3, and 4.

### **K) Becks Depression Inventory** (Beck et al, 1961): Studies 3, and 4.

Size reduced to 85% for inclusion into thesis.

A) Three Factor Eating Questionnaire.

Eating Questionnaire

Part I

**Instructions:**

Please answer the following questions by circling one of the responses (**T for true/F for false**) which seems more appropriate for you at the moment. Please try to answer **ALL** the questions, and **DO NOT** return back to questions you have already answered.

1) When I smell or see a really appetising piece of food, I find it very difficult to keep from eating, even if I have just finished a meal.

T F

2) I usually eat too much at social occasions, like parties and picnics.

T F

3) I am usually so hungry that I eat more than three times a day.

T F

4) When I have eaten my quota of calories, I am usually good at not eating any more.

T F

5) Dieting is so hard for me because I just get too hungry.

T F

6) I deliberately take small helpings as a means of controlling my weight.

T F

7) Sometimes things just taste so good that I keep on eating even when I am no longer hungry.

T F

8) Since I am often hungry, I sometimes wish that while I am eating, an expert would tell me that I have had enough or that I can have something more to eat.

T F

9) When I feel anxious, I find myself eating.

T F

10) Life is too short to worry about dieting

T F

11) Since my weight goes up and down, I have gone on reducing diets more than once.

T F

- |  |   |   |
|--|---|---|
| 12) I often feel so hungry that I just have to eat something.  | T | F |
| 13) When I am with someone who is overeating, I usually overeat too.   | T | F |
| 14) I have a pretty good idea of the number of calories in common food.  | T | F |
| 15) Sometimes when I start eating, I just can't seem to stop.  | T | F |
| 16) It is not difficult for me to leave food on my plate.  | T | F |
| 17) At certain times of the day, I get hungry because I have got used to eating then.                                  | T | F |
| 18) While on a diet, if I eat food that is not allowed, I consciously eat less for a period of time to make up for it. | T | F |
| 19) Being with someone who is eating often makes me hungry enough to eat also.   | T | F |
| 20) When I feel sad or down I often overeat.   | T | F |
| 21) I enjoy eating too much to spoil it by counting calories or watching my weight.                                    | T | F |
| 22) When I see a real delicacy, I often get so hungry that I have to eat right away.                                   | T | F |
| 23) I often stop eating when I am not really full as a conscious means of limiting the amount I eat.                   | T | F |
| 24) I get so hungry that my stomach seems like a bottomless pit.   | T | F |
| 25) My weight has hardly changed at all in the last ten years.   | T | F |
| 26) I am always hungry so it is hard for me to stop eating before I finish the food on my plate.                       | T | F |
| 27) When I feel lonely, I console myself by eating.  | T | F |

28) I consciously hold back at meals in order not to gain weight. T F

29) I sometimes get very hungry late in the evening or at night. T F

30) I eat anything I want, any time I want. T F

31) Without even thinking about it, I take a long time to eat. T F

32) I count calories as a conscious means of controlling my weight. T F

33) I do not eat some foods because they make me fat. T F

34) I am always hungry enough to eat at any time. T F

35) I pay a great deal of attention to changes in my figure. T F

36) While on a diet, if I eat a food that is not allowed, I often then 'splurge' and eat other high calorie foods. T F

### Eating questionnaire-PART II

#### **Instructions for part II:**

In this section please answer the following questions by circling the number above the response that is most appropriate for you. Please circle only one number per question, and again do not alter answers you have already given.

37) How often are you dieting in a conscious effort to control your weight?

1	2	3	4
rarely	sometimes	usually	always

38) Would a weight fluctuation of 5 lb. (2.3 kg.) affect the way you live your life?

1	2	3	4
not at all	slightly	moderately	very much



39) How often do you feel hungry?

1	2	3	4
only at mealtimes	sometimes between meals	often between meals	almost always

40) Do your feelings of guilt about overeating help you to control your food intake?

1	2	3	4
never	rarely	often	always

41) How difficult would it be for you to stop eating halfway through dinner and not eat any more for the next four hours?

1	2	3	4
easy	slightly difficult	moderately difficult	very difficult

42) How conscious are you of what you are eating?

1	2	3	4
not at all	slightly	moderately	extremely

43) How frequently do you **avoid** 'stocking up' on tempting foods?

1	2	3	4
almost never	seldom	usually	almost always

44) How likely are you to shop for low calorie foods?

1	2	3	4
unlikely	slightly unlikely	moderately likely	very likely

45) Do you eat sensibly in front of others and overeat or binge alone?

1	2	3	4
never	rarely	often	always

46) How likely are you consciously to eat slowly in order to cut down on how much you eat?

1	2	3	4
unlikely	slightly unlikely	moderately likely	very likely

47) How frequently do you **skip** dessert because you are no longer hungry?

1	2	3	4
almost never	seldom	at least once a week	almost every day

48) How likely are you to eat consciously less than you want?

1	2	3	4
unlikely	slightly unlikely	moderately likely	very likely

49) Do you go on eating binges though you are not hungry?

1	2	3	4
never	rarely	sometimes	at least once a week

50) On a scale of 0 to 5, where 0 means no restraint in eating (i.e. eating whatever you want, whenever you want) and 5 means total restraint (constantly limiting food intake and never 'giving in'), what number would you give yourself.

0
eat whatever you want, whenever you want
1
usually eat whatever you want, whenever you want it
2
often eat whatever you want, whenever you want it
3
often limit food intake, but often 'give in'
4
usually limit food intake, rarely 'give in'
5
constantly limiting food intake, never 'give in'

51) To what extent does this statement describe your eating behaviour? 'I start dieting in the morning, but because of any number of things that happen during the day, by evening I have given up and eat what I want, promising myself to start dieting again tomorrow.'

1	2	3	4
not like me	little like me	pretty good description of me	describes me perfectly

## B) Revised Restraint scale with weight fluctuation and concern with dieting items.

This questionnaire consists of ten questions with a set of possible responses boxed below each question. Please read each question carefully and choose which of the possible responses describes you best. You can mark response choices by circling, underlining, or crossing out your chosen response. Please be sure to select only one response for each question. Please respond to all the questions.

**PLEASE NOTE.** Items referring to weight measurements have all been converted to kilograms from the original USA format. For your information there are 14 pounds in one stone, 1 stone is approximately 6.3 kg., and 1 kilogram = 2.25 pounds. Please estimate where you are unsure of what answer to give.

1. How often are you dieting?

never	rarely	sometimes	often	always
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2. What is the maximum amount of weight (in kg.) that you have ever lost within one month (approximately)?

0-1.8	2.3-4	4.5-6.4	6.8-8.6	9+
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3. What is your maximum weight gain within one week (in kg)?

0 - 0.45	0.5 - 0.9	0.95 - 1.36	1.4 - 2.3	2.32+
----------	-----------	-------------	-----------	-------

4. In a typical week, how much does your weight fluctuate (in kg.)?

0 - 0.45	0.5 - 0.9	0.95 - 1.36	1.4 - 2.3	2.32+
----------	-----------	-------------	-----------	-------

5. Would a weight fluctuation of approximately 2.3 kg. affect the way you live your life?

Not at all	slightly	moderately	very much
------------	----------	------------	-----------

6. Do you eat sensibly in front of others and 'splurge' alone?

never	rarely	often	always
-------	--------	-------	--------

7. Do you give too much time and thought, in your opinion, to food?

never	rarely	often	always
-------	--------	-------	--------

8. Do you have feelings of guilt after overeating?

never	rarely	often	always
-------	--------	-------	--------

9. How conscious are you of what you are eating?

not at all	slightly	moderately	extremely
------------	----------	------------	-----------

10. How many kilograms over your desired weight were you at your maximum weight?

0-0.45	0.45-2.27	2.27-4.45	4.99-9	9.5+
--------	-----------	-----------	--------	------

C) Revised restraint scale Concern with dieting sub-scale.

Eating habits questionnaire-English version

Instructions

This questionnaire consists of ten questions with a set of possible responses boxed below each question. Please read each question carefully and choose which of the possible responses describes you best. You can mark response choices by circling, underlining, or crossing out your chosen response. Please be sure to select only one response for each question. Please respond to all the questions.

**PLEASE NOTE.** Items referring to weight measurements have all been converted to kilograms from the original USA format. For your information there are 14 pounds in one stone, 1 stone is approximately 6.3 kg., and 1 kilogram = 2.25 pounds. Please estimate where you are unsure of what answer to give.

1. How often are you dieting?

never	rarely	often	always
-------	--------	-------	--------

2. Would a weight fluctuation of approximately 2.3 kg. affect the way you live your life?

Not at all	slightly	moderately	very much
------------	----------	------------	-----------

3. Do you eat sensibly in front of others and 'splurge' alone?

never	rarely	often	always
-------	--------	-------	--------

4. Do you give too much time and thought, in your opinion, to food?

never	rarely	often	always
-------	--------	-------	--------

5. Do you have feelings of guilt after overeating?

never	rarely	often	always
-------	--------	-------	--------

6. How conscious are you of what you are eating?

not at all	slightly	moderately	extremely
------------	----------	------------	-----------

D) Physical appearance state/trait anxiety inventory. Items 1 to 8 are body weight fat items. Items 9 to 16 are non-body weight items. The trait version is first.

PASTAS.

Instructions

This questionnaire consists of two parts examining feelings you have about parts of your body. Please read the following instructions carefully, taking care to answer as honestly as possible.

PART A: The statements listed below are used to describe how anxious, tense, or nervous you feel *in general* about your body or specific parts of your body.

Use the following scale to rate each body part in turn:

0	1	2	3	4
never	rarely	sometimes	often	almost always

*In general*, I feel anxious, tense, or nervous about:

1. The extent to which I look overweight	0	1	2	3	4
2. My thighs	0	1	2	3	4
3. My buttocks	0	1	2	3	4
4. My hips	0	1	2	3	4
5. My stomach (abdomen)	0	1	2	3	4
6. My legs	0	1	2	3	4
7. My waist	0	1	2	3	4
8. My muscle tone	0	1	2	3	4
9. My ears	0	1	2	3	4
10. My lips	0	1	2	3	4
11. My wrists	0	1	2	3	4
12. My hands	0	1	2	3	4
13. My forehead	0	1	2	3	4
14. My neck	0	1	2	3	4
15. My chin	0	1	2	3	4
16. My feet	0	1	2	3	4

PART B: The next set of statements below are used to describe how anxious, tense, or nervous you feel *right now* about your body or specific parts of your body. The statements below are the same as the ones above EXCEPT that they refer to how you feel **right at this moment**, the different rating scale emphasises this.

Use the following NEW scale when responding to statements:				
0	1	2	3	4
Not at all	Slightly	Moderately	Very much so	Exceptionally

**Right now** I feel anxious, tense, or nervous about:

1. The extent to which I look overweight	0	1	2	3	4
2. My thighs	0	1	2	3	4
3. My buttocks	0	1	2	3	4
4. My hips	0	1	2	3	4
5. My stomach (abdomen)	0	1	2	3	4
6. My legs	0	1	2	3	4
7. My waist	0	1	2	3	4
8. My muscle tone	0	1	2	3	4
9. My ears	0	1	2	3	4
10. My lips	0	1	2	3	4
11. My wrists	0	1	2	3	4
12. My hands	0	1	2	3	4
13. My forehead	0	1	2	3	4
14. My neck	0	1	2	3	4
15. My chin	0	1	2	3	4
16. My feet	0	1	2	3	4

E) Goldfarb Fear of Fat scale.

Goldfarb Scale

Please read each of the following statements and for each statement select one of the numbers below which best represents your feelings and beliefs.

1 = very untrue      2=somewhat untrue    3=somewhat true    4=very true.

- |   |   |   |   |   |
|---|---|---|---|---|
| 1. My biggest fear is of becoming fat.  | 1 | 2 | 3 | 4 |
| 2. I am afraid to gain even a little weight.  | 1 | 2 | 3 | 4 |
| 3. I believe there is a real risk that I will become overweight someday.                              | 1 | 2 | 3 | 4 |
| 4. I don't understand how overweight people can live with themselves.                                 | 1 | 2 | 3 | 4 |
| 5. Becoming fat would be the worst thing that could happen to me.                                     | 1 | 2 | 3 | 4 |
| 6. If I stopped concentrating on controlling my weight, chances are I would become very fat.          | 1 | 2 | 3 | 4 |
| 7. There is nothing that I can do to make the thought of gaining weight less painful and frightening. | 1 | 2 | 3 | 4 |
| 8. I feel like all my energy goes into controlling my weight.   | 1 | 2 | 3 | 4 |
| 9. If I eat even a little, I may lose control and not stop eating.                                    | 1 | 2 | 3 | 4 |
| 10. Staying hungry is the only way I can guard against losing control and becoming fat.               | 1 | 2 | 3 | 4 |

F) Eating Disorders Inventory drive for thinness, Body dissatisfaction and bulimia subscales.

**EDI**

**INSTRUCTIONS**

This questionnaire measures various aspects of attitudes, feelings, and behaviours related to eating and other areas in general. Below are a set of statements with a rating scale immediately to its right. For each item, decide if the item is true about you ALWAYS (A), USUALLY (U), OFTEN (O), SOMETIMES (S), RARELY (R), or NEVER (N). Circle the letter that corresponds to your rating on the answer section. For example, if your rating for an item is OFTEN, you would circle the O for that item in the answer section.

Respond to all of the items, making sure that you circle the letter for the rating that is true about you. DO NOT ERASE! If you need to change an answer, make an "X" through the incorrect letter and then circle the correct one.

- |  |   |   |   |   |   |   |
|--|---|---|---|---|---|---|
| 1. I eat sweets and carbohydrates without feeling nervous. | A | U | O | S | R | N |
| 2. I think that my stomach is too big.                     | A | U | O | S | R | N |
| 3. I eat when I am upset.                                  | A | U | O | S | R | N |
| 4. I stuff myself with food.                               | A | U | O | S | R | N |
| 5. I think about dieting.                                  | A | U | O | S | R | N |
| 6. I think that my thighs are too large.                   | A | U | O | S | R | N |
| 7. I feel extremely guilty after overeating.               | A | U | O | S | R | N |
| 8. I think that my stomach is just the right size.         | A | U | O | S | R | N |
| 9. I am terrified of gaining weight.                       | A | U | O | S | R | N |
| 10. I feel satisfied with the shape of my body.            | A | U | O | S | R | N |



11. I exaggerate or magnify the importance of weight.	A	U	O	S	R	N
12. I have gone on eating binges where I felt that I could not stop.	A	U	O	S	R	N
13. I like the shape of my buttocks.	A	U	O	S	R	N
14. I am preoccupied with the desire to be thinner.	A	U	O	S	R	N
15. I think about bingeing (overeating).	A	U	O	S	R	N
16. I think my hips are too big.	A	U	O	S	R	N
17. I eat moderately in front of others and stuff myself when they're gone.	A	U	O	S	R	N
18. If I gain a pound, I worry that I will keep gaining.	A	U	O	S	R	N
19. I have thought of trying to vomit in order to lose weight.	A	U	O	S	R	N
20. I think that my thighs are just the right size.	A	U	O	S	R	N
21. I think my buttocks are too large.	A	U	O	S	R	N
22. I eat or drink in secrecy.	A	U	O	S	R	N
23. I think that my hips are just the right size.	A	U	O	S	R	N

G) Participant and Dietary Demographic Questionnaire.

Please fill in the following general information about yourself.

Age: \_\_\_\_\_.

Gender: \_\_\_\_\_.

Occupation : \_\_\_\_\_.

First Language: \_\_\_\_\_.

Do you wish to be slimmer than you are now? YES / NO

Do you wish to be larger than you are now? YES / NO

Have you ever in your life intentionally gone on a diet to lose weight? (delete as appropriate) YES / NO.

If you have been on a diet, to lose weight, at what age did you first diet? \_\_\_\_\_.

Are you currently on a diet to lose weight? YES / NO .

If you answered 'YES' to the above question then how long have you been on this diet \_\_\_\_\_ (days/months/years)

In general, does your cultural background suggests that slim, medium, or large body shape is more attractive for your gender? (delete as appropriate): slim/medium/large

Have you ever been diagnosed as having a medical and/or psychological eating difficulty (e.g. thyroid, diabetes, anorexia, bulimia nervosa)? YES / NO

Have you at any time received medical or psychological treatment for an eating disorder (e.g. anorexia or bulimia nervosa)? YES / NO

Weight/Height.

Either fill this in now if you know your height and weight, or leave blank for now. If you leave this blank then measurements will be taken after the study with your permission.

Weight

in either stones \_\_\_\_\_ lbs \_\_\_\_\_,  
or kg: \_\_\_\_\_.

Height

in either metres \_\_\_\_\_ cm \_\_\_\_\_,  
or feet \_\_\_\_\_ inches \_\_\_\_\_.



14	Some people have the experience of sometimes remembering a past event so vividly that they feel as if they were reliving that event.	0%	10	20	30	40	50	60	70	80	90	100%
15	Some people have the experience of not being sure whether things that they remember happening really did happen or whether they just dreamed them.	0%	10	20	30	40	50	60	70	80	90	100%
16	Some people have the experience of being in a familiar place but finding it strange and unfamiliar.	0%	10	20	30	40	50	60	70	80	90	100%
17	Some people find that when they are watching television or a movie they become so absorbed in the story that they are unaware of other events happening around them.	0%	10	20	30	40	50	60	70	80	90	100%
18	Some people find that they become so involved in a fantasy or daydream that it feels as though it were really happening to them.	0%	10	20	30	40	50	60	70	80	90	100%
19	Some people find that they sometimes are able to ignore pain.	0%	10	20	30	40	50	60	70	80	90	100%
20	Some people find that they sometimes sit staring off into space, thinking of nothing, and are not aware of the passage of time.	0%	10	20	30	40	50	60	70	80	90	100%
21	Some people sometimes find that when they are alone they talk out loud to themselves.	0%	10	20	30	40	50	60	70	80	90	100%
22	Some people find that in one situation they may act so differently compared with another situation that they feel almost as if they were two different people	0%	10	20	30	40	50	60	70	80	90	100%
23	Some people sometimes find that in certain situations they are able to do things with amazing ease and spontaneity that would usually be difficult for them (for example, sports, work, social situations, etc.).	0%	10	20	30	40	50	60	70	80	90	100%
24	Some people sometimes find that they cannot remember whether they have done something or have just thought about doing that thing (for example, not knowing whether they have just mailed a letter or have just thought about mailing it).	0%	10	20	30	40	50	60	70	80	90	100%
25	Some people find evidence that they have done things that they do not remember doing.	0%	10	20	30	40	50	60	70	80	90	100%
26	Some people sometimes find writings, drawing, or notes among their belongings that they must have done but cannot remember doing.	0%	10	20	30	40	50	60	70	80	90	100%
27	Some people sometimes find that they hear voices inside their head that tell them to do things or comment on things that they are doing.	0%	10	20	30	40	50	60	70	80	90	100%
28	Some people sometimes feel as if they are looking at the world through a fog so that people and objects appear far away or unclear.	0%	10	20	30	40	50	60	70	80	90	100%

DAQ/dc

Edited : 14 December 1994

## PERCEPTUAL ALTERATION SCALE

**DIRECTIONS :** This questionnaire consists of statements which describe experiences which people may have in their every day lives. Please tick in the box to the right of each item to show how often that statement applies to you. It is important that your answers do *not* refer to times when you may have been affected by alcohol or drugs.

Item	Description	Never	Sometimes	Frequently	Almost Always
2	I can't understand why I get so cross and grouchy.				
3	I feel out of touch with my body.				
6	I have fits of laughing and crying that I cannot control.				
7	When I get tired or upset it seems like an outside force comes in to control my actions.				
8	My body is too heavy.				
12	My mind wants one thing but my body is determined to do another.				
17	In some situations my mind and my body are just not together.				
18	My moods can really change.				
20	I forget right away what people say to me.				
23	I find myself concealing my activities from others.				
24	I am glad I can forget what I look like.				
25	I do many things which I regret afterwards.				
27	What my body is doing has nothing to do with me.				
30	I don't know how to stop myself from doing something.				
31	I find myself in a strange place without knowing how I got there.				
32	I get torn between doing one thing or another.				
33	I find myself doing things without knowing why.				
34	I feel compelled to think and act in a way that is out of character for me.				
36	I wish I didn't watch my every move.				
37	Even when I have missed several meals I find that I am not hungry.				
38	I find my mind blank.				
49	I want to do two conflicting things at once and find myself arguing with myself.				
50	I feel that my mind is divided.				
53	I feel that there are two of me.				
54	I do things without thinking.				
57	I find I have hidden something and don't know why.				
60	I see myself differently than other people see me.				

DAO/dc

Edited 22 November 1994

## SDS

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the item is *true* or *false* as it pertains to you personally. If you think a question is not of direct relevance to you, then answer for how you think you would act in that situation.

1. Before voting I thoroughly investigate the qualifications of all the candidates.

True / False

2. I never hesitate to go out of my way to help someone in trouble.

True / False

3. It is sometimes hard for me to carry on with my work if I am not encouraged.

True / False

4. I have never intensely disliked someone.

True / False

5. On occasion I have had doubts about my ability to succeed in life.

True / False

6. I sometimes feel resentful when I don't get my own way.

True / False

7. I am always careful about my manner of dress.

True / False

8. My table manners at home are as good as when I eat out in a restaurant.

True / False

9. If I could get into a movie without paying and be sure I was not seen I would probably do it.

True / False

10. On a few occasions, I have given up doing something because I have thought too little of my ability.

True / False

11. I like to gossip at times.  
True / False
12. There have been times when I felt like rebelling against authority even though I knew they were right.  
True / False
13. No matter who I'm talking to I am always a good listener.  
True / False
14. I can remember playing 'sick' to get out of something.  
True / False
15. There have been occasions when I took advantage of someone.  
True / False
16. I'm always willing to admit it when I make a mistake.  
True / False
17. I always try to practice what I preach.  
True / False
18. I don't find it particularly difficult to get along with loud mouthed, obnoxious people.  
True / False
19. I sometimes try to get even rather than forgive and forget.  
True / False
20. When I don't know something I don't at all mind admitting it.  
True / False
21. I am always courteous, even to people who are disagreeable.  
True / False
22. At times I have really insisted on having things my own way.  
True / False

23. There have been occasions when I felt like smashing things.

True / False

24. I would never think of letting someone else be punished for my wrong-doings.

True / False

25. I never resent being asked to return a favour.

True / False

26. I have never been irked when people expressed ideas very different from my own.

True / False

27. I never take a long trip without checking the safety of my car.

True / False

28. There have been times when I was quite jealous of the good fortune of others.

True / False

29. I have almost never felt the urge to tell someone off.

True / False

30. I am sometimes irritated by people who ask favours of me.

True / False

31. I have never felt that I was punished without cause.

True / False

32. I sometimes think when people have a misfortune they only got what they deserved.

True / False

33. I have never deliberately said something that hurt someone's feelings.

True / False

END OF QUESTIONNAIRE.

Thankyou for your participation.



**BDI QUESTIONNAIRE**

This questionnaire consists of 21 groups of statements (indicated by numbers 1 to 21). After reading each group of statements carefully, circle the number (0, 1, 2 or 3) next to the one statement in each group which best describes the way you have been feeling the past week, including today. If several statements within a group seem to apply equally well, circle each one. Be sure to read all the statements in each group before making your choice.

1.

- 0 I do not feel sad
- 1 I feel sad
- 2 I am sad all the time and I can't snap out of it
- 3 I am so sad or unhappy that I can't stand it

2.

- 0 I am not particularly discouraged about the future
- 1 I feel discouraged about the future
- 2 I feel that I have nothing to look forward to
- 3 I feel that the future is hopeless and that things cannot improve

3.

- 0 I do not feel like a failure
- 1 I feel I have failed more than the average person
- 2 As I look back on my life all I can see is a lot of failures
- 3 I feel I am a complete failure as a person

4.

- 0 I get as much satisfaction out of things as I used to
- 1 I don't enjoy things the way I used to
- 2 I don't get real satisfaction out of anything anymore
- 3 I am dissatisfied or bored with everything

5.

- 0 I don't feel particularly guilty
- 1 I feel guilty a good part of the time
- 2 I feel quite guilty most of the time
- 3 I feel guilty all of the time

6.

- 0 I don't feel I am being punished
- 1 I feel I may be punished
- 2 I expect to be punished
- 3 I feel I am being punished

7.

- 0 I don't feel disappointed in myself
- 1 I am disappointed in myself
- 2 I am disgusted with myself
- 3 I hate myself

- 
- 0 I don't feel I am any worse than anybody else
  - 1 I am critical of myself for my weaknesses or mistakes
  - 2 I blame myself all the time for my faults
  - 3 I blame myself for everything bad that happens

9.

- 0 I don't have any thoughts of killing myself
- 1 I have thoughts of killing myself but I would not carry them out
- 2 I would like to kill myself
- 3 I would kill myself if I had the chance

10.

- 0 I don't cry any more than usual
- 1 I cry more now than I used to
- 2 I cry all the time now
- 3 I used to be able to cry but now I can't cry even though I want to

11.

- 0 I am no more irritated now than I ever am
- 1 I get annoyed or irritated more easily than I used to
- 2 I feel irritated all the time now
- 3 I don't get irritated at all by the thin-s that used to irritate me

12.

- 0 I have not lost interest in other people
- 1 I am less interested in other people than I used to be
- 2 I have lost most of my interest in other people
- 3 I have lost all of my interest in other people

13.

- 0 I make decisions about as well as I ever could
- 1 I put off making decisions more than I used to
- 2 I have greater difficulty in making decisions than before
- 3 I can't make decisions at all anymore

14.

- 0 I don't feel I look any worse than I used to
- 1 I am worried that I am looking old or unattractive
- 2 I feel that there are permanent changes to my appearance that make me look unattractive
- 3 I believe that I look ugly

15.

- 0 I can work about as well as before
- 1 It takes an extra effort to get started at doing something
- 2 I have to push myself very hard to do anything
- 3 I can't do any work at all

16.

- 0 I can sleep as well as usual
- 1 I don't sleep as well as I used to
- 2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep
- 3 I wake up several hours earlier than I used to and cannot get back to sleep

- 0 I don't get more tired than usual
- 1 I get tired more easily than I used to
- 2 I get tired from doing almost anything
- 3 I am too tired to do anything

18.

- 0 My appetite is no worse than usual
- 1 My appetite is not as good as it used to be
- 2 My appetite is much worse now
- 3 I have no appetite at all anymore

19.

- 0 I haven't lost much weight, if any, lately
- 1 I have lost more than 5 pounds (2 kilos)
- 2 I have lost more than 10 pounds (4 kilos)
- 3 I have lost more than 15 pounds (7 kilos)

I am purposely trying to lose weight by eating less:

YES \_\_\_\_\_ NO \_\_\_\_\_

20.

- 0 I am no more worried about my health than usual
- 1 I am worried about physical problems such as aches and pains; or upset stomach; or constipation
- 2 I am very worried about physical problems and it's hard to think of much else
- 3 I am so worried about my physical problems that I cannot think about anything else

21.

- 0 I have not noticed any recent changes in my interest in sex
- 1 I am less interested in sex than I used to be
- 2 I am much less interested in sex now
- 3 I have lost interest in sex completely

## APPENDIX B

### BODY IMAGE SUGGESTIONS FROM THE MODIFIED CREATIVE

#### IMAGINATION SCALE

The example given below is for the body size increase (fat) item. For the body size decrease item (thin item) the wording is identical except that the words/phrases in brackets replace those in italics. Where italicized words are followed by a negative sign (-) then that word is omitted in the thin script. Where a word in brackets is not preceded by italics then that word is added in the thin script.

‘Keep your eyes closed. By letting your thoughts go along with these instructions you can make your body feel *larger* (thinner) and *heavier* (skinnier).

Picture yourself sitting in a comfortable armchair. Now let yourself feel every part of your body getting *larger* (thinner) and *heavier* (skinner). Become aware of every sensation and change in your body as you think of your entire body *expanding* (-), becoming *larger* (thinner) and *larger* (thinner), *heavier* (lighter) and *fatter* (skinnier). You do it yourself, you create the feeling of your whole body *increasing* (decreasing) in size and weight, becoming *larger* (thinner) and *heavier* (lighter). Focus on imagining your body’s weight and size *increasing* (decreasing). Tell yourself that every part of your body is becoming *larger* (thinner) and *larger* (thinner), *heavier* (lighter) and *heavier* (lighter). Imagine your stomach (shrinking) getting *larger* (smaller) and *larger* (smaller), your hips and thighs becoming *larger* (thinner) and *larger* (thinner), your arms and legs *larger* (thinner) and *heavier* (skinnier). Experience yourself becoming *larger* (thinner) and *larger* (thinner), *heavier* (lighter) and *heavier* (lighter), *expanding outwards, filling the chair you are sitting in* (thinner and skinnier, so skinny that your clothes are becoming baggier, your clothes are becoming very baggy). Imagine almost getting too *big* (skinny) *to fit in* (for your) your clothes as you get *larger* (thinner) and *larger* (thinner), even *heavier* (lighter) and *heavier* (lighter), *very large* (thin), *very heavy* (light), *very fat* (skinny). *Larger* (thinner)...*Heavier* (lighter)...*Fatter* (skinnier).

[5 second pause]

Now tell yourself that it is all in your own mind and make your body feel perfectly normal again, perfectly normal again.’

## APPENDIX C

### INTER-CORRELATIONS BETWEEN EATING MEASURES.

#### Study 1.

**Table A1.**

**Inter-correlations between measures of dietary restraint, dietary disinhibition, and body anxiety.**

Eating concerns measures	1	2	3	4	5	6	7	8	9	10	11
1 Concern for dieting (RRS)	-										
2 Cognitive restraint (TFEQ)	.79**	-									
3 Disinhibition of eating (TFEQ)	.60**	.44*	-								
4 Susceptibility to hunger (TFEQ)	.43*	.28	.38	-							
5 Current dieting	.48*	.50**	.38	.29	-						
6 State Body anxiety (fat, PASTAS)	.59**	.60**	.47*	.37	.40*	-					
7 State body anxiety (non-fat, PASTAS)	.35	.24	.38	.29	.10	.62**	-				
8 Trait body anxiety (fat, PASTAS)	.66**	.62**	.50**	.39	.37	.78**	.41*	-			
9 Trait body anxiety (non-fat, PASTAS)	.35	.24	.38	.29	.10	.62**	1.0**	.41*	-		
10 Age	-.02	-.02	.09	-.08	.06	.04	.22	-.12	.22	-	
11 BMI	.12	.19	.09	-.01	.19	.05	-.07	.16	-.07	-.04	-
12 Weight	-.05	.01	.07	.06	-.05	.09	.002	-.05	.002	.17	.06

\*p<0.01, \*\*p <0.001.

Bonferroni corrected alpha = 0.0007

All p values are 2-tailed.

## Study 2

**Table 4.2.**  
**Correlation matrix of current dieting,**  
**dietary restraint, and social desirability measures.**

<i>r</i> (n = 87)	Currently dieting? ( <i>r<sub>pb</sub></i> )	Concern for dieting	Cognitive restraint	Disinhibition of eating	Susceptibility to hunger
Currently dieting?	-				
Concern for dieting (RRS)	.32**	-			
Cognitive restraint (TFEQ)	.44**	.73** (.85**)	-		
Disinhibition of eating (TFEQ)	-.03	.45** (.56**)	.19	-	
Susceptibility to hunger (TFEQ)	-.08	.12	-.15	.26* (.37*)	-
Social desirability (SDS)	.05	-.03	.09	-.39**	-.12

\* $p < 0.01$ , \*\* $p < 0.001$ . All correlations are 2-tailed.

Bonferroni corrected alpha = 0.003

Correlations in brackets represent dis-attenuation<sup>1</sup> of the significant correlations in terms of scale reliabilities, where reliability scores are available.

<sup>2</sup> Dis-attenuation of correlations represents an attempt to control for the influence of scale reliabilities by dividing the original correlation by the square-root of the product of scale reliabilities.

## **HYPNOTIZABILITY AND BODY IMAGE MALLEABILITY IN RESTRAINED AND NON-RESTRAINED EATERS**

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### **Abstract**

Hypnotizability may play a moderating role in the internalization of body image ideals and may also mediate suggested distortion of body image self-representations, especially in restrained eaters. A modified version of the Creative Imagination Scale (CIS) incorporating a body expansion and a body reduction item, was used to examine the relationship between hypnotizability, dietary restraint and body image manipulation in restrained and non-restrained eaters. Dietary restraint was measured in 40 female undergraduate participants using the Three-Factor Eating Questionnaire and the Revised Restraint Scale. The results suggest that hypnotizability, as measured by the CIS, correlates significantly with both measures of dietary restraint. In addition, restrained eaters demonstrated generally elevated susceptibility to body image modification compared with unrestrained eaters, though both restrained and non-restrained eaters appeared to be more susceptible to imagining body size expansion than reduction. These results are discussed in relation to social influences on eating and dietary disorders.

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**Key words:** hypnotizability, body image, dietary restraint, eating disorders, social pressure

### **Introduction**

The past few decades have seen an apparent widespread increase in diet and body shape concerns in western society. Indeed such preoccupations have become the norm (e.g. Strigel-Moore et al., 1986), especially amongst female middle-class Caucasian populations (e.g. Heunemann et al., 1966; Dwyer and Mayer, 1970; see also Stice, 1994, and Hsu, 1990, for reviews). Restrained eating behaviours and attitudes, incorporating aspects of body shape and dietary concern, have been implicated as risk factors in the development of dietary disorders such as anorexia nervosa and bulimia nervosa (e.g. Herman and Mack, 1975; Herman and Polivy, 1975, 1980; Hsu, 1990; Heatherton and Polivy, 1992; Polivy and Herman, 1985; Stice 1994). It is important therefore to explore factors and individual differences which may transform this widespread concern with body shape and dieting into clinical pathologies (e.g. Schwartz et al., 1985; Hsu, 1990).

Changing socio-cultural exemplars of feminine attractiveness toward a slimmer body (the 'thin ideal'), together with the symbolic rewards of achieving such an ideal, have been blamed for elevated body size concerns and motivation to diet (Brownell, 1991; see Stice, 1994, for a review). Exemplars of this thin ideal may be especially

salient motivators to diet as they fall below population weight norms (e.g. Garner and Garfinkel, 1980). Acute exposure to attractive (thin) media exemplars has been found to disinhibit eating in restrained eaters (Seddon and Berry, 1996); to lead to an increase in body size distortion in bulimics and anorexics as well as non-clinical controls with elevated dieting concerns and elevated food intake scores (Waller et al., 1992); and to negatively affect aspects of body satisfaction in non-clinical participants (e.g. Ogden and Munday, 1996). Individual differences which may moderate the extent to which thin ideals are internalized, and/or manipulate individuals' representations of body experience, may play important roles in increasing the discrepancy between desired and actual body image. Understanding such individual differences may lead to identifying non-clinical pre-cursors to clinical and sub-clinical eating difficulties. Of particular interest to this study were the effects of individual differences in hypnotic capacity, in a waking suggestibility context, on both dietary restraint status and capacity to imagine suggested body image changes.

A number of studies have found significant positive correlations in non-clinical populations between both restrained eating and weight concern attitudes in relation to hypnotizability (e.g. Groth-Marnat and Schumaker, 1990; Wybraniec and Oakley, 1996; Frasilho and Oakley, 1997). Similarly, bulimics show elevated hypnotizability compared to age matched-controls (e.g. Pettinati et al., 1985; Covino et al., 1994). Such findings may indicate an elevated receptivity to suggestive communications in restraining and bulimic individuals, which may be especially important in internalizing cultural attractiveness ideals, and therefore increasing the salience of achieving those ideals. The 'hyper-internalization' of such ideals has been posited as a risk factor in developing dietary disorders (Striegel-Moore et al., 1986). One aim of this study was to measure relationships between hypnotizability in a waking suggestibility context, and aspects of restrained and impulsive eating.

The capacity to experience body image changes, a phenomenon amenable to hypnotic manipulation, may be another factor motivating restraint behaviours and attitudes that may lead to eating disorder pathology. Wybraniec and Oakley (1996) examined the subjective experience of body image in response to suggested body image change in fatter and thinner directions. Their findings suggested restrained eaters were significantly more responsive to suggestions of body size increase but not decrease, whilst non-restrained eaters were resistant to both suggestions. Body image distortion, especially in the direction of body size increase, may increase the subjective difference between self image and ideal body image, thereby increasing motivation to restrain eating to reduce such a discrepancy.

The present study improved the procedures used by Wybraniec and Oakley (1996) in a number of ways in order to re-assess subjective responses to suggested body image change, as moderated by restraint status, and in relation to impulsive eating and body fat anxiety. The original study used a modified six item version of the 10 item Creative Imagination Scale (CIS: Wilson and Barber, 1978) to measure waking susceptibility, with the relaxation item placed first, which may have acted as a hypnotic induction, both factors possibly reducing the scale's efficacy as a waking suggestibility measure. Also the two body image manipulation items were placed consecutively half-way in the modified CIS with the thinner item always immediately preceding the fatter item.

The present study, which is part of a larger ongoing project, used the full 10 item CIS with the relaxation item last and with the addition of counterbalanced body image items interspersed within the scale to reduce familiarity and expectancy effects. The body image items in the present study were also modified to focus more on bodily sensations rather than changes in visual imagery. In addition this study used some



relevant measures not included in the original: body dissatisfaction and body mass index (BMI: Kilograms/height in metres<sup>2</sup>), both of which may be related to motivation to restrain eating, and an additional measure of restraint.

If, as suggested above, hypnosis moderates restraint behaviour then we would expect a positive relation between susceptibility measures and restraint measures. Restrained eaters should also exhibit elevated levels of hypnotizability/waking suggestibility compared to non-restrained eaters. Motivation to restrain may also be related to elevated body image malleability, especially in fatter directions, with higher levels of malleability leading to more motivation to restrain. If this is the case then restrained eaters should demonstrate elevated body malleability especially in fatter directions, compared to non-restrained eaters. In addition, factors such as body dissatisfaction and impulsive eating may also moderate such motivations in assisting the triggering and perpetuation of restraint behaviour.

## Method

### *Subjects*

The participants comprised 40 female undergraduates from University College London departments of Medicine and Psychology (mean age 19, SD = 1.9). All were within the normal range of BMI (selected range 16–30, mean 21.1, SD = 2.1), and had not reported any previous medical or psychological treatment for an eating disorder. All participants were required to give informed consent to take part in this study.

### *Materials*

#### *Modified Creative Imagination Scale (MCIS: 12 item)*

The original Creative Imagination Scale (CIS: Wilson and Barber, 1978) was designed to measure cognitive and imagery dimensions of hypnotizability using a non-authoritarian, non-challenge set of suggestions based on ten imaginary scenarios (e.g. drinking cool water, or time slowing down). The modified version, used in this study, included two extra scenarios involving imagining one's body becoming larger and fatter, and imagining one's body becoming thinner and smaller (see appendix for details). These body image items were introduced as items four and eight of the modified scale. Suggestions were self-scored in terms of their comparative subjective reality on a likert-type scale ranging between 0 (not at all the same) and four (almost exactly the same). All scenarios were audiotaped for standardized presentation, and a self-scoring rating sheet was used. The CIS is normally administered without an induction procedure, as in this study, and so may also be considered a measure of so called 'waking suggestibility' which may be predictive of hypnotizability (Spanos et al., 1989).

#### *Revised Restraint Scale – restraint sub-scale (RRS-R) (Herman and Polivy, 1980)*

The original 10 item scale consisted of two sub-scales measuring dietary restraint behaviour and attitudes, and weight fluctuation. Only the five item restraint sub-scale was used here as the weight fluctuation sub-scale has demonstrated procedural difficulties in terms of high non-completion rates (Wardle, 1986). All items were rated 0–3 with higher scores representing elevated restraint.

#### *Eating Questionnaire (EQ)*

This 36 item scale originally known as the Three Factor Eating Questionnaire (Stunkard and Messick, 1985), was developed to measure restrained eating, disinhibi-

tion of eating and susceptibility to hunger, in order to assess behaviours and attitudes related to problematic eating patterns. Based on recent research (Collins et al., 1992) the last two factors were collapsed here to form a single factor identified as impulsive eating. Higher scores represent elevated levels of the behaviours measured.

*Physical Appearance State/Trait Anxiety Scale, trait body fat sub-scale (PAS-TAS trait-fat) (Reed et al., 1991)*

The original scale was developed to assess trait and state levels of anxiety related to various body parts either related or unrelated to body fat areas. This study used only the trait body fat sub-scale. Anxiety was rated from 0 (not at all anxious) to 4 (very anxious), with total scores being summed across sub-scale items.

*Design and Procedures*

The experimental procedures incorporated a 2x2 mixed design, with suggested body image manipulation, in either fatter or thinner directions, as a within subjects variable, and with restraint status manipulated as a between subjects variable. Restraint status was determined post-experimentally using separate measures from each of the self-report restraint scales used (RRS and EQ restraint sub-scales), with a median split used to determine restrained and non-restrained eaters. The dependent variable for this design was subjective reality of body image change rated between 0 (not at all the same) to 4 (just almost exactly the same) for each of the body image modification items.

The body image items were incorporated into a modified version of the CIS, with order of presentation of body image items counterbalanced across participants. The modified CIS was self-scored by participants after audio presentation of the scale itself. In addition to presentation of the RRS-R and restraint sub-scale of the EQ (EQ-R), participants completed self-report measures of impulsive eating from the EQ, and body-fat trait anxiety from the PASTAS. The order of presentation of the self-report measures was counterbalanced with the presentation and scoring of the MCIS items. The MCIS was presented in a hypnotic context as 'a test predictive of hypnotic capacity'. This was done to make the scale more predictive of 'hypnotizability' as measured by other standardised tests normally preceded by an induction procedure (Spanos et al., 1989), whilst retaining the elements of waking suggestibility. BMI was measured post-experimentally using a domestic weighing scale and tape measure, and was used as a control variable to exclude obese individuals (BMI 30+) and possibly anorexic participants (BMI $\leq$ 16). The study was presented as 'examining eating habits and creative imagery'. Participants were tested in groups varying from two to seven individuals.

## **Results**

Participants were classified as restrainers or non-restrainers on the basis of two separate restraint measures (EQ-R or RRS-R) using median split procedures. Statistical analyses were conducted separately for each of these two restraint/non-restraint groupings. The experimental data consisted of participants' ratings of the subjective reality of suggested body size modification, rated separately for changes in fatter and thinner directions, using a five point scale ranging from 0 to 4, with higher scores indicating greater subjective reality of the suggestions. Mean subjective body size changes are displayed in Figures 1 and 2 for each type of restraint classification.

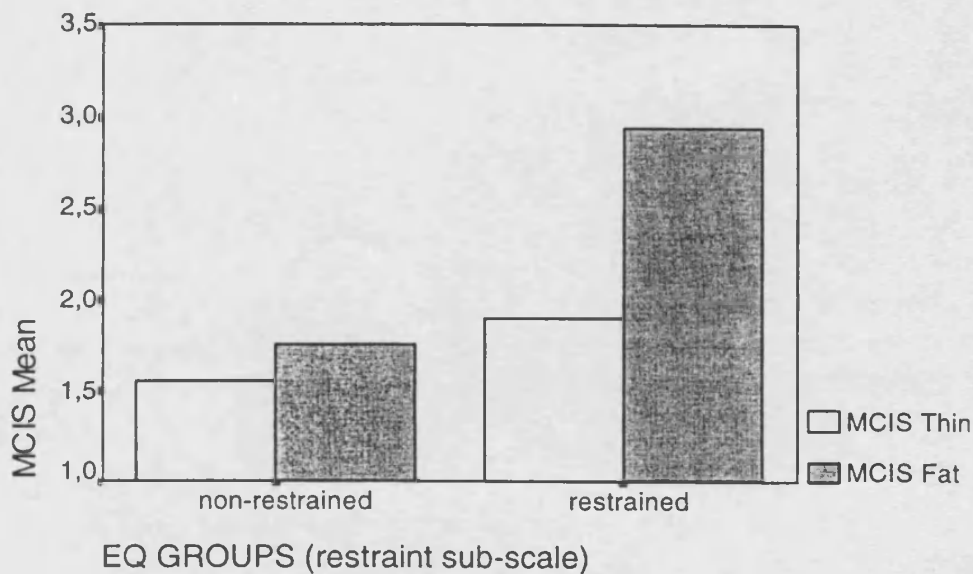


Figure 1. This graph represents restrained and non-restrained groups, based on a median split of the EQ-R (eating questionnaire-restraint sub-scale), and the mean subjective reality of suggestions for body image malleability towards fatter and thinner directions.

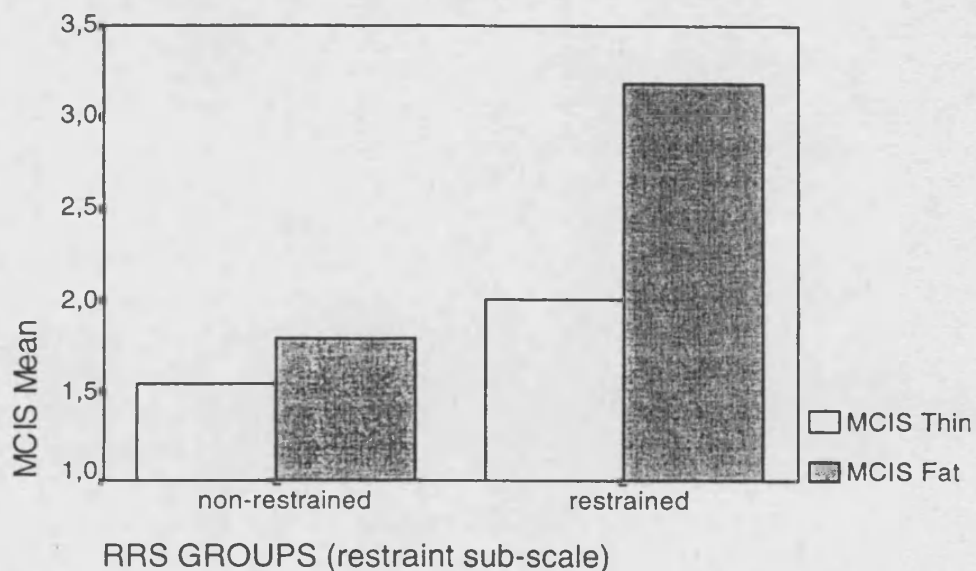


Figure 2. This graph represents restrained and non-restrained groups, based on a median split of the RRS-R (revised restraint scale - restraint sub-scale), and the mean subjective reality of suggestions for body image malleability towards fatter and thinner directions.

The data suggest that, regardless of restraint classification method used, restrainers experience more subjectively real changes in response to body modification suggestions than unrestrained eaters, especially in fatter directions. Mixed 2x2 ANOVAs (restraint status by suggested body change direction) were conducted on the experimental data. Similar results were obtained for the two restraint classification methods, with significant main effects of restraint status as the between subjects factor (RRS-R groups:  $F_{1,38} = 7.85$ ,  $p < 0.01$ ; EQ-R groups:  $F_{1,38} = 5.41$ ,  $p = 0.025$ ) and suggested body image change as the within subjects factor (RRS-R groups:  $F_{1,38} = 12.37$ ,

$p = 0.001$ ; EQ-R groups:  $F_{1,38} = 9.55$ ,  $p < 0.005$ ). Significant interactions were also found in both ANOVAs for restraint and body image change (RRS-R groups:  $F_{1,38} = 5.26$ ,  $p = 0.027$ ; EQ-R groups:  $F_{1,38} = 4.42$ ,  $p < 0.05$ ).

*Post hoc* analysis, using corrected *t*-tests (a set at 0.006 to allow for multiple comparisons, Bonferroni correction), was used to further explore the data. For both classification measures restrainers showed significantly elevated imagability compared to non-restrainers for the fat item (independent *t*-tests: RRS-R groups,  $t_{38} = -3.61$ ,  $p = 0.0005$ ; EQ-R groups,  $t_{38} = -3.05$ ,  $p < 0.005$ , all tests 1 tailed), but not the thin item (independent *t*-tests: RRS-R,  $t_{38} = -1.17$ ,  $p > 0.05$ ; EQ-R:  $t_{38} = -0.91$ ,  $p > 0.05$ ). Restrainers also exhibited significant differences between imaging fat and thin items, regardless of classification measure (paired *t*-tests: RRS-R restrainers,  $t_{15} = 3.05$ ,  $p = 0.005$ ; EQ-R restrainers,  $t_{19} = 3.20$ ,  $p = 0.0025$ , all tests 1 tailed). Non-restrainers, however, showed no significant differences in imaging fat or thin items (paired *t* tests: RRS-R non-restrainers,  $t_{15} = 1.19$ ,  $p > 0.05$ ; EQ-R non-restrainers,  $t_{19} = 0.85$ ,  $p > 0.05$ , all tests 1 tailed).

*T*-tests also confirmed that restrained eaters are potentially significantly more hypnotizable, as measured by the 10 regular CIS items, than non-restrained eaters, for both types of restraint measures (RRS-R, restrainers mean = 28.26, SD = 5.8, non-restrainers mean = 21.75, SD = 6.38,  $t_{38} = -3.27$ ,  $p < 0.01$ ; EQ-R restrainers mean = 26.40, SD = 5.7, non-restrainers mean = 22.3, SD = 7.44,  $t_{38} = -1.95$ ,  $p < 0.05$ , all tests 1 tailed).

### Correlational analyses

Correlational analyses of waking suggestibility/potential hypnotizability, assuming the CIS is predictive of hypnotizability (Spanos et al., 1989), and capacity to image suggested body size changes in relation to restraint scores, impulsive eating, and trait body part anxiety, yielded the correlation matrix (Pearson's *r* coefficients, all controlling for BMI) shown in Table 1.

Table 1. Correlational matrix of waking suggestibility (CIS) and capacity to image body suggested change (MCIS Fat, MCIS Thin), in relation to restraint scores (RRS and EQ-restraint), impulsive eating (impulse), and trait body fat part anxiety (PASTAS trait – fat)

	RRS-R	EQ-R	PASTAS trait (fat)	EQ impulsive
CIS	0.52***	0.36*	0.30	0.15
MCIS fat	0.56***	0.53***	0.57***	0.42**
MCIS thin	0.28	0.016	0.15	-0.016

Significant correlations in bold, probability asterixed as follows: \* $p \leq 0.05$ , \*\* $p \leq 0.01$ , \*\*\* $p \leq 0.001$ . All probabilities are 2-tailed.

Hypnotizability, as reflected in the CIS scores, showed significant moderate to strong associations with both the restraint measures, but not trait body fat anxiety or impulsive eating. The modified CIS fat item, however, significantly correlated with all other measures to a strong extent, whilst the modified CIS thin item failed to correlate with any other measures. Although not shown in Table 1, the two body change items significantly correlated with each other ( $r = 0.48$ ,  $p < 0.01$ ), and both correlated

with the CIS total (unmodified CIS -10 items: MCIS Fat,  $r = 0.57$ ,  $p < 0.001$ ; MCIS Thin,  $r = 0.54$ ,  $p < 0.001$ ).

Correlational analysis of the restraint, body anxiety, and impulsive eating measures (again controlling for BMI, and using Pearson's  $r$ ) produced the correlation matrix shown in Table 2.

Table 2. Correlation matrix of restraint measures (RRS, EQ restraint sub-scales), Trait body part fat anxiety, and Impulsive eating

	EQ-R	PASTAS trait (fat)	EQ impulsive
RRS-R	<b>0.75***</b>	<b>0.68***</b>	<b>0.61***</b>
EQ-R	<b>0.63***</b>	<b>0.44**</b>	
PASTAS trait (fat)	<b>0.54***</b>		

Significant correlations in bold, probability asterixed as follows: \* $p \leq 0.05$ , \*\* $p \leq 0.01$ , \*\*\* $p \leq 0.001$ . All probabilities are 2-tailed.

Strong significant and positive associations were found between all the above variables, providing good support for relationships between body dissatisfaction, impulsive eating behaviours and restrained eating behaviours.

## Discussion

This study set out to evaluate the extent to which restrained and non-restrained eaters demonstrated a different capacity for body image alteration, or 'body image malleability', in response to suggested changes in body size. Restrained eaters in this study, compared to non-restrained eaters, demonstrated a significantly elevated capacity to experience suggested body image change in the fatter but not in the thinner directions, along with significantly higher levels of waking suggestibility, and potential hypnotizability, assuming the CIS is predictive of hypnotizability (Spanos et al., 1989). The restrained eaters capacity to display body image malleability in fatter directions, was significantly greater than their malleability in thinner directions, whereas a non-significant difference was evidenced in non-restrained eaters. These results held regardless of the measure used to classify restrained and non-restrained attitudes, not surprisingly perhaps given the high correlation between the two measures used (i.e. RRS and EQ restraint sub-scales). These results support evidence found by Wybraniec and Oakley (1996) and are consistent with the hypothesis that elevated body image malleability is present in restrained eaters.

Biases in the perception of body image may play an important motivational role in the development of restrained eating behaviours. Perceived, rather than actual body weight is regarded as more predictive of female participants' ratings of attractiveness in other females (Alley and Scully, 1994). An enhanced capacity to perceive oneself as fatter than in reality may be especially salient, since it may influence the discrepancy an individual experiences between self-perceived body image and desired body image, potentially increasing body dissatisfaction and the desire to restrain. The strong positive correlations for restraint and body fat anxiety in relation to the MCIS

fat item, supports this view. It is likely, therefore, that body image malleability, especially in fat directions, may contribute to the motivation to restrain eating and to restraint attitudes in general, either directly or through increased body dissatisfaction. A significant correlation was found between waking suggestibility/potential hypnotizability, and responsiveness to the MCIS fat suggestion, but the extent to which body imageability is related to hypnotic and/or waking suggestibility rather than imageability *per se* is a pertinent question and an issue for future research.

Differential body image malleability in relationship to dietary restraint, if it proves to be a robust phenomenon, may also interact with the presentation of thin-ideal exemplars. Acute presentation of thin ideal exemplars may initiate a comparison process between desired and self-perceived body image, with the effect of increased body image malleability negatively influencing the self-appraisal component. Another related perspective on body image malleability, especially in fat directions, is its relation to triggering disinhibited eating. Heatherton and Baumeister (1991) suggest that binge eating results out of an escape from aversive self-realizations. Also, ego-threat has been proposed as one of the central triggers for disinhibiting eating in restrained eaters (e.g. Herman and Polivy, 1975; Heatherton et al., 1991, 1992). The capacity to image oneself as fatter may exacerbate the impact of aversive self-realization, or ego threat, either in isolation or as a result of media exposure effects. The significant positive correlations between the MCIS fat item and impulsive eating lend support to the hypothetical triggering effect of body malleability related ego-threat leading to binge eating behaviour. Aspects of a putative disinhibitory role of body image malleability in a fat direction need to be examined behaviourally, incorporating disinhibition paradigms (e.g. Herman and Mack, 1975; Herman and Polivy, 1975).

The question of temporal relationships between body malleability (in fat directions), body dissatisfaction, restrained and impulsive eating, also needs to be addressed. It is important to ask, for example, whether restraint, impulsivity, and body dissatisfaction are consequences of elevated body image malleability, or whether such malleability is a result of cyclical dieting patterns and/or pubertal growth experiences. The capacity to image different body size states might be a function of the capacity to recall previous body size states or changes. Chronic restrained eaters with cyclical diet and overeating behaviours, may experience greater body weight fluctuations, thereby increasing their capacity to image body size changes.

Turning to the correlational data, the results provide further support for the view that restraint and hypnotizability, or at least waking suggestibility, are related. Such relationships as those found between the CIS and the restraint measures suggest a potential moderating effect of hypnotic/suggestibility components on the motivation to restrain. Perhaps such a relationship operates specifically through body image malleability. Alternatively, it may be evidence of a more general suggestibility which facilitates the internalization of socio-cultural messages related to body image and body dissatisfaction (Frasquilho and Oakley, 1997; Oakley and Frasquilho, 1998). Different tests of waking suggestibility, uncontaminated by expectations relating to hypnosis, may test the relationship between restraint and alternative forms of suggestibility. Positive significant correlations between restraint, impulsive eating, body dissatisfaction, demonstrating strong relationships, support the theoretical mediating and moderating relationships between such variables (see Stice, 1994 for a review). Unfortunately, as with any correlational data, caution must be used in interpreting these results as representing causal implications.

**References**

- Alley TR, Scully KM. The impact of actual and perceived changes in body weight on women's physical attractiveness. *Basic and Applied Social Psychology* 1994; 15(4): 535-43.
- Brownell KD. Dieting and the search for the perfect body: Where physiology and culture collide. *Behavior Therapy* 1991; 22: 1-12.
- Collins RL, Helder L, Saltzberg JA. Cognitive restraint and impulsive eating: Insights from the Three-Factor Eating Questionnaire. *Psychology of Addictive Behaviours* 1992; 6: 47-53.
- Covino NA, Jimerson DC, Wolf BE, Franko DL, Frankel FH. Hypnotizability, dissociation and Bulimia Nervosa. *Journal of Abnormal Psychology* 1994; 103: 455-9.
- Dwyer JT, Mayer J. Potential dieters: Who are they? *Journal of American Dietetic Association* 1970; 56: 510-14.
- Frasquilho FM, Oakley DA. Hypnotizability, dissociation and three factors of eating behaviour. *Contemporary Hypnosis* 1997; 14: 105-111.
- Garner DM, Garfinkel PE. Socio-cultural factors in the development of Anorexia Nervosa. *Psychological Medicine* 1980; 10: 647-656.
- Garner DM, Garfinkel PE, Schwartz D, Thompson M. Cultural expectations of thinness in women. *Psychological Reports* 1980; 47: 483-91.
- Groth-Marnat G, Schumaker JF. Hypnotizability, attitudes towards eating, and concern with body size in a female college population. *American Journal of Clinical Hypnosis* 1990; 35: 194-200.
- Heatherton TF, Baumeister RF. Binge eating as an escape from self-awareness. *Psychological Bulletin* 1991; 110: 86-108.
- Heatherton TF, Herman CP, Polivy J. Effects of physical threat and ego threat on eating behaviour. *Journal of Personality and Social Psychology* 1991; 60: 138-43.
- Heatherton TF, Herman CP, Polivy J. Effects of distress on eating: The importance of ego involvement. *Journal of Personality and Social Psychology* 1992; 62: 801-803.
- Heatherton TF, Polivy J. Chronic Dieting and eating disorders: A spiral model. In Crowther JH, Tennenbaum DL, Hobfoll SE, Stephens MAP, eds. *The Etiology of Bulimia Nervosa: The Individual and Familial Context*. HPC: USA, 1992.
- Herman CP, Mack D. Restrained and unrestrained eating. *Journal of Personality* 1975; 43: 647-60.
- Herman CP, Polivy J. Anxiety, restraint, and eating behaviour. *Journal of Abnormal Psychology* 1975; 84: 666-72.
- Herman CP, Polivy J. Restrained Eating. In Stunkard AJ, ed. *Obesity*. Philadelphia: Wiley, 1980.
- Heunemann RL, Shapiro LR, Hampton MC, Mitchell BW. A longitudinal study of gross body composition and body conformation and their association with food and activity in a teenage population. *American Journal of Clinical Nutrition* 1966; 18: 325-38.
- Hsu GLK. *Eating Disorders*. New York: Guildford Press, 1990.
- Oakley DA, Frasilho FM. Hypnotic susceptibility, or F-bias: Its relevance to eating disorders. *Contemporary Hypnosis* 1998; 15: in Press.
- Ogden J, Munday K. The effect of the media on body satisfaction: the role of gender and size. *European Eating Disorders Review* 1996; 4: 171-82.
- Pettinati HM, Horne RL, Staats JM. Hypnotizability in patients with Anorexia Nervosa and Bulimia. *Archives of General Psychology* 1985; 42: 1014-16.
- Polivy J, Herman CP. Dieting and Bingeing: A causal analysis. *American Psychologist* 1985; 40: 193-201.
- Reed DL, Thompson JK, Brannick MT, Sacco WP. Development and validation of the Physical Appearance State and Trait Anxiety Scale (PASTAS). *Journal of Anxiety Disorders* 1991; 5: 323-32.
- Schwartz DM, Thompson MG, Johnson CL. Anorexia Nervosa and Bulimia: The socio-cultural context. *International Journal of Eating Disorders* 1985; 1: 20-36.
- Seddon L, Berry N. Media-induced disinhibition of dietary restraint. *Journal of Health Psychology* 1996; 1: 27-33.
- Spanos NP, Gabora NJ, Jarret LE, Gwynn MI. Contextual determinants of hypnotizability and of relationships between hypnotizability scales. *Journal of Personality and Social Psychology* 1989; 57: 271-78.
- Stice E. Review of the evidence for a sociocultural model of bulimia nervosa and exploration

- of the mechanisms of action. *Clinical Psychology Review* 1994; 14: 633–61.
- Striegel-Moore RH, Silberstein LR, Rodin J. Towards an understanding of risk factors in bulimia. *American Psychologist* 1986; 41: 246–63.
- Stunkard AJ, Messick S. The three factor eating questionnaire to measure dietary restraint, disinhibition, and hunger. *Journal of Psychosomatic Research* 1985; 29: 71–83.
- Waller G, Hamilton K, Shaw J. Media influences on body size estimation in eating disordered and comparison subjects. *British Review of Bulimia and Anorexia Nervosa* 1992; 6: 81–87.
- Wardle J. The assessment of restrained eating. *Behaviour Research and Therapy* 1986; 24: 213–15.
- Wilson SC, Barber TX. The Creative Imagination Scale as a measure of hypnotic responsiveness: Applications to experimental and clinical hypnosis. *American Journal of Clinical Hypnosis* 1978; 20: 235–49.
- Wybraniec A, Oakley D. Dietary restraint, hypnotizability, and body image. *Contemporary Hypnosis* 1996; 13: 150–55.

### **Appendix. Suggested body change scripts**

The example given below is for the body size increase (fat) item. For the thin item the wording is identical except that the words/phrases in brackets replace those in italics. Where italicized word are followed by a negative sign (-) then that word is omitted in the thin script. Where a word in brackets is not preceded by italics then that word is added in the thin script.

Keep your eyes closed. By letting your thoughts go along with these instructions you can make your body feel *larger* (thinner) and *fatter* (skinnier).

Picture yourself sitting in a comfortable armchair. Now let yourself feel every part of your body getting *larger* (thinner) and *heavier* (skinnier). Become aware of every sensation and change in your body as you think of your entire body *expanding* (-), becoming *larger* (thinner) and *larger* (thinner), *heavier* (lighter) and *fatter* (skinnier). You do it yourself, you create the feeling of your whole body *increasing* (decreasing) in size and weight, becoming *larger* (thinner) and *heavier* (lighter). Focus on imagining your body's weight and size *increasing* (decreasing). Tell yourself that every part of your body is becoming *larger* (thinner) and *larger* (thinner), *heavier* (lighter) and *heavier* (lighter). Imagine your stomach (shrinking) getting *larger* (smaller) and *larger* (smaller), your hips and thighs becoming *larger* (thinner) and *larger* (thinner), your arms and legs *larger* (thinner) and *heavier* (skinnier). Experience yourself becoming *larger* (thinner) and *larger* (thinner), *heavier* (lighter) and *heavier* (lighter), *expanding outwards*, *filling the chair you are sitting in* (thinner and skinnier, so skinny that your clothes are becoming baggy, your clothes are becoming very baggy). Imagine almost getting too *big* (skinny) *to fit in* (for) your clothes as you get *larger* (thinner) and *larger* (thinner), even *heavier* (lighter) and *heavier* (lighter), very *large* (thin), very *heavy* (light), very *fat* (skinny). *Larger* (thinner) . . . *Heavier* (lighter) . . . *Fatter* (skinnier).

[5 second pause]

Now tell yourself that it is all in your own mind and make your body feel perfectly normal again, perfectly normal again.

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## **MAIN PAPER**

### **HYPNOTIZABILITY, DISSOCIATION AND THREE FACTORS OF EATING BEHAVIOUR**

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#### **INTRODUCTION**

Concepts such as hypnosis and dissociation have attracted increasing interest within dietary disorder research, especially in the investigation of bulimia nervosa and bulimic tendencies. A number of studies have revealed that, compared with age-matched controls, individuals expressing bulimic tendencies demonstrate elevated levels of hypnotizability (e.g., Pettinati, Horne & Staats, 1985; Groth-Marnat & Schumaker, 1990; Barabasz, 1991; Kranhold, Baumann & Fichter, 1992; Covino, Jimerson, Wolfe, Franko & Frankel, 1994) and increased dissociative capacity (e.g., Sanders, 1986; Torem, 1986; Demitrak, Putnam, Brewerton, Brandt & Gold, 1990; McCallum, Lock, Kulla, Rorty & Wetzel 1992; Vanderlinden, Van Dyck, Vandereycken & Vertommen, 1993; Rosen & Petty, 1994). Despite evidence that dissociative and hypnotic capacities are both greater in bulimics, measures of these two capacities are themselves only modestly correlated (Nadon, Hoyt, Register & Khilstrom, 1991; Frischholz, Braun, Sachs, Schwartz, Lewis, Shaeffer, Westergaard & Pasquotto, 1992; Oakman, Woody & Bowers, 1996) and may represent the operation of different, yet related, psychological processes. Given that hypnosis and dissociation are only loosely correlated and, in view of the complex nature of bulimic aetiology, it appears likely that hypnotic and dissociative mechanisms may operate on different psychological aspects of this type of eating disorder.

The use of specific psychological measures of eating behaviours and attitudes is helpful in constructing theoretical frameworks that may relate aspects of bulimic tendencies to hypnotic and dissociative mechanisms. Unfortunately, few studies have as yet identified specific behavioural and psychological patterns, relating to hypnotic and dissociative capacity, which are associated with bulimic behaviour and bulimic tendencies. Groth-Marnat and Schumaker (1990) did find interesting associations between hypnotizability and concerns over weight and fat, suggesting the operation of social factors, possibly moderated by hypnotic capacity. Similarly, Wybraniec and Oakley (1996) found moderate correlations between hypnosis in a waking context and cognitive aspects of dietary restraint. In terms of dissociative capacity Rosen and Petty (1994) found high to moderate correlations in a college population between both affective and loss-of-control aspects of dissociation and a wide range of eating disordered behaviours and attitudes, including bulimic tendencies.

The present study aimed to further identify specific dimensions of bulimic tendencies that may be significantly associated with hypnotizability and dissociative capacity. Of specific interest were non-clinical precursors of subsequent bulimic pathology possibly influenced by hypnotizability and dissociation. One suggested risk factor for developing bulimic tendencies, as well as anorexia and obesity, has been the conscious attempt to restrain dietary intake and the related factor of disinhibited or impulsive eating (e.g., Herman and Mack, 1975; Herman & Polivy, 1975, 1980, 1984; Charnock, 1989; Heatherton & Polivy, 1992). Both hypnotizability and dissociative capacity may relate to social and cognitive processes relevant to the expression and/or maintenance of dietary restraint and disinhibited eating. This study used a measure of dissociative capacity, and a measure of hypnotizability, emphasizing waking susceptibility which may have direct relevance to processes operating in everyday social contexts. Cognitive restraint and disinhibited eating patterns, along with susceptibility to hunger, form the three central dimensions of the Three Factor Eating Questionnaire (Stunkard & Messick, 1985), which constituted the main measure for this study.

## METHODS

### *Subjects*

All participants were female undergraduates of normal body weight from various departments in University College London. Individuals with a history of medical or psychological treatment for an eating disorder were excluded from the study. Forty volunteer subjects were recruited into the study (mean age 22.4 years), with three dropped from final analysis due to incomplete questionnaires, leaving a total of 37 participants.

### *Materials*

#### *The Three Factor Eating Questionnaire*

The Three Factor Eating Questionnaire (TFEQ; Stunkard & Messick, 1985) represents a measure of eating behaviours that relate primarily to restrained eating, but also measures factors of importance in relation to clinical and non-clinical bulimic tendencies. The questionnaire consists of 51 items, divided into three categories, corresponding to measurement of the following factors: cognitive restraint of eating (e.g., 'I deliberately take small helpings as a means of controlling my weight'), disinhibition of control over eating (e.g., 'sometimes when I start eating I just can't seem to stop'), and susceptibility to hunger (e.g., 'I sometimes get very hungry very late in the evening or at night'). Total scores for each factor can range from 0 (lowest) to 17 (highest). Slight modifications were made to the original TFEQ by altering wording in questions mentioning meat to prevent negative bias due to vegetarian food preferences and current worries about BSE.

#### *The Creative Imagination Scale*

Hypnotizability was measured using the Creative Imagination Scale (CIS; Wilson & Barber, 1978; Barber & Wilson, 1978/79), which acts as an effective predictor of hypnotizability when presented in hypnotic contexts (e.g., Spanos, Gabora, Jarrett & Gwynn, 1989), though tending to measure cognitive and imagery based dimensions of hypnotizability. In this study the CIS was presented without prior hypnotic induction in order to act as a measure of waking susceptibility. The CIS consists of 10 imaginary

scenarios relating to events (e.g., arm levitation) and sensations (e.g., hallucinating music), which participants are encouraged to imagine actively. No authoritarian or challenge based items are used in order to reduce negative motivational set (Wilson & Barber, 1978). Participants rate the subjective reality of each imagined scenario on four point Likert-type scales, ranging from 0 (not at all the same as a real experience) to 4 (almost exactly the same), presented in questionnaire format. Total scores may range from 0 (lowest) to 40 (highest). The CIS was recorded on audio tape, preceded with motivational 'think with' instructions designed to promote active imaginative engagement. 'Think with' instructions were based on those used by Wilson and Barber (1978).

#### *The Dissociative Experiences scale — II*

Level of dissociative capacity was measured using the Dissociative Experiences scale — II (DES II: Bernstein & Putnam, 1993). The DES II consists of 28 statements describing dissociation like experiences of self-identity (e.g., 'Some people have the experience of looking in a mirror and not recognizing themselves'), memory (e.g., 'Some people have the experience of finding themselves in clothes they don't remember putting on'), and absorption (e.g., 'Some people find that they become so involved in a fantasy or daydream that it feels as though it were really happening to them'). The overall scale tends to measure cognitive-control aspects of dissociation (Fisher & Elnitsky, 1990). Participants are invited to rate the presence of such experiences in their daily lives on a interval percentage scale (0–100%, with intervals of 10%), circling the appropriate percentage value. Total scores consist of the sum of participants circled responses divided by the number of statements, with a range of 0–100.

#### *Procedure*

Informed consent was obtained from all participants, who were tested either individually or in small groups ( $n < 4$ ) at the University College London Hypnosis Unit. All participants were informed that the CIS would be given as a measure of hypnotizability followed by one or more questionnaires assessing eating behaviours and dissociative experiences. Testing procedures consisted of administration of the audio-taped CIS followed by presentation of the CIS rating sheet, then the DES II, and finally the TFEQ. All participants were informed of the importance of honesty when replying to questionnaire items.

## RESULTS

Total scores from the CIS, DES II, and TFEQ sub-scales for all participants were analysed using correlational techniques in order to investigate the relationships between the factors involved. This analysis revealed the correlations shown in Table 1. All correlations correspond to Pearson's product moment ( $r$ ).

These results clearly reveal that hypnotizability, measured in a waking context using the CIS, correlated significantly and at a high level with the TFEQ cognitive restraint factor only. The reverse pattern of correlations was found in relation to dissociative experiences as measured using the DES II, with high significant correlations between the DES II and the disinhibition of control and susceptibility to hunger factors of the TFEQ, but not the cognitive restraint factor. In addition, correlational analysis of the CIS and the DES II demonstrated a high level of association ( $r = 0.59$ ,  $P < 0.001$ ).

Table 1. Patterns of Pearson's product moment correlations for the CIS and DES on each of the three dimensions of the TFEQ with significance levels, based on data from 37 participants

	Cognitive restraint	Disinhibition of control	Susceptibility to hunger
CIS	0.66*	0.28	0.16
DES II	0.31	0.55*	0.49**

Significance levels: \* =  $P < 0.001$ , \*\* =  $P < 0.01$ )

Explorative stepwise regressions conducted on each of the TFEQ factors with the CIS and DES II scores as predictors ( $n = 37$  in all cases) supported the above results, with the CIS on its own being the best predictor of cognitive restraint (adj.  $R^2 = 0.42$ ,  $F_{1,35} = 27.51$ ,  $P < 0.00001$ ), whilst the DES II scores alone were the best predictors of the disinhibition of control, and hunger factors (disinhibition: adj.  $R^2 = 0.29$ ,  $F_{1,35} = 15.64$ ,  $P < 0.0005$ ; hunger: adj.  $R^2 = 0.23$ ,  $F_{1,35} = 11.53$ ,  $P < 0.001$ ).

## DISCUSSION

Hypnotizability, measured in a waking context by the CIS, displayed a strong significant correlation only with the cognitive restraint factor of the TFEQ, whilst dissociative capacity, measured by the DES, correlated significantly with the remaining factors, disinhibition of control and susceptibility to hunger, but not with the cognitive restraint factor. The high correlation between the CIS and DES II is surprising given that past research has suggested that hypnotizability and dissociative capacity are related but principally orthogonal factors (Nadon *et al.*, 1991; Frischholz *et al.*, 1992), though the cognitive nature of both the DES II (Fisher & Elnitsky, 1990) and the CIS measures may account for this strong association. The high correlation between the CIS and DES II scores may be problematic in statistical separation of associations between both hypnotizability and dissociation and the sub-scales of TFEQ, but the stepwise analysis lends partial support to the separate predictive power of the hypnotizability and dissociation as measured by CIS and DES II respectively. Causal analysis of these contrasting associations is precluded by the study's correlational design, but these results appear to support two hypotheses outlined below as the Socio-Hypnotic and Dissociative Escape approaches.

The Socio-Hypnotic hypothesis (e.g., Groth-Marnat & Schumaker, 1990) suggests that high hypnotizability influences internalization of socio-cultural body-related ideals, leading to 'hyper-internalization' of such ideals (Striegel-Moore, Silberstein, & Rodin, 1986), resulting in increased motivation towards achieving social acceptability and social success. The strong association between hypnotizability and cognitive restraint found in the present study may reflect underlying socio-hypnotic mechanisms, especially if restraint is interpreted as an attempt to reduce discrepancies between a 'hyper-internalized' ideal and an actual body image and weight. 'Hyper-internalization' of social ideals has previously been proposed as a factor in the development of eating difficulties (Striegel-Moore *et al.*, 1986), and has been associated with hypnotizability and weight concerns in earlier studies (e.g., Groth-Marnat & Schumaker, 1990). Additionally, hypnotizability may moderate the capacity to distort body image towards larger body sizes in restrained eaters

(Wybraniec & Oakley, 1996), increasing the discrepancy between social and individual body representations.

The relationship between the representational processes involved in social internalization and those involved in hypnosis is as yet unclear. It is possible that the increased salience of social acceptability in bulimics, which has been illustrated in a number of studies (e.g., Blanchard & Frost, 1983; Striegel-Moore, Silberstein & Rodin, 1993), may parallel increased social compliance and a partial increase in suggestibility experienced under hypnosis, with high hypnotizables experiencing accentuated effects. The present study concentrated on more cognitive and imaginal aspects of hypnosis in a waking context and the extent to which the results obtained here generalize to other hypnotic dimensions and contexts is the subject of future research.

The second major hypothesis, the Dissociative Escape approach (Heatherton & Baumeister, 1991; McManus, 1995), focuses on dissociation as a disintegrating of thought, affect, and behaviour, from controlling conscious influence and awareness, possibly responsible, in part, for loss-of-control experiences found especially during eating binges. The association between dissociative capacity and disinhibited eating found in this study may reflect the operation of dissociative mechanisms, either as defences against aversive self-realizations or self-attention (Heatherton & Baumeister, 1991; McManus, 1995), or as a consequence of binge behaviour acting as an attentional focus occupying or disrupting higher level control functions. Susceptibility to hunger may also be stronger if higher level attentional control is weakened, therefore reducing cognitive efforts to ward off hunger signals. Approaches in cognitive psychology that distinguish lower level action systems, responsible for routine or automatic behaviours, from higher level executive (Hilgard, 1986) or supervisory attentional control and regulation (e.g., Norman & Shallice, 1980), already provide frameworks for understanding dissociation (e.g., Woody & Bowers, 1994) and may be useful in understanding bingeing and disinhibited eating. Such approaches need to be tempered with caution, however, as recent work (Valdiserri & Khilstrom, 1995a,b) has identified depression as a possible confounding factor when considering the influence of dissociation upon eating behaviour. Also, dissociation, like hypnosis, is not a monolithic concept. The term 'dissociation' may encompass several dimensions that affect eating behaviour to differing extents (Rosen & Petty, 1994), and, again, which of those dimensions are relevant requires further investigation.

Indeed, a number of issues raised by this study need to be addressed in future research. Especially important is participants' use of socially desirable response sets when answering eating related questions, and how such response biases relate to social factors influencing eating difficulties. The vagueness currently pervasive in the definition and quantification of concepts such as hypnosis, dissociation, restrained eating and related behaviours, also poses problems for such research, especially considering their multi-faceted nature. The preliminary data presented here nonetheless illustrate potentially interesting associations between the areas of hypnotizability, dissociation, and eating behaviour, which may be helpful in expanding our understanding of how hypnosis, hypnotizability and dissociation relate to aspects of bulimic tendencies, especially in non-clinical contexts.

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## REFERENCES

- Barabasz, M. (1991). Hypnotizability in bulimia. *International Journal of Eating Disorders* **10**, 117-120.
- Barber, T.X. & Wilson, S.C. (1978/79). The Barber Suggestibility Scale and the Creative Imagination Scale: Experimental and clinical applications. *American Journal of Clinical Hypnosis* **21**, 84-108.
- Bernstein, E. & Putnam, F.W. (1993). An update on the dissociative experiences scale. *Dissociation* **6**, 16-27.
- Blanchard, F.A. & Frost, R.O. (1983). Two factors of restraint: Concern for dieting and weight fluctuation. *Behaviour Research and Therapy* **21**, 259-267.
- Charnock, D.J.K. (1989). A comment on the role of dietary restraint in the development of bulimia nervosa. *British Journal of Clinical Psychology* **28**, 329-340.
- Covino, N.A., Jimerson, D.C., Wolfe, B.E., Franko, D.L. & Frankel, F.H. (1994). Hypnotizability, dissociation, and bulimia nervosa. *Journal of Abnormal Psychology* **103**, 455-459.
- Demitrak, M.A., Putnam, F.M., Brewerton, T.D., Brandt, H.A. & Gold, P.W. (1990). Relation of clinical variables to dissociative phenomena in eating disorders. *American Journal of Psychiatry* **147**, 1184-1188.
- Fisher, D.G. & Elnitsky, S. (1990). A factor analytic study of two scales measuring dissociation. *American Journal of Clinical Hypnosis* **32**, 201-207.
- Frischholz, E.J., Braun, B.G., Sachs, R.G., Schwartz, D.R., Lewis, J., Shaeffer, D., Westergaard, C. & Pasquotto, J. (1992). Construct validity of the dissociative experiences scale II: Its relationship with hypnotizability. *American Journal of Clinical Hypnosis* **35**, 145-152.
- Groth-Marnat, G. & Schumaker, J.F. (1990). Hypnotizability, attitudes toward eating, and concern with body size in a female college population. *American Journal of Clinical Hypnosis* **32**, 194-200.
- Heatherton, T.F. & Baumeister, R.F. (1991). Binge eating as escape from self-awareness. *Psychological Bulletin* **110**, 86-108.
- Heatherton, T.F. & Polivy, J. (1992). Chronic dieting and eating disorders: A spiral model. In Crowther, J.H., Tannenbaum, D.L., Hobfoll, S.E. & Stephens, M.A.P. (Eds), *The Etiology Of Bulimia Nervosa: The Individual and Familial Context*. HPC: Bristol.
- Herman, C.P. & Mack, D. (1975). Restrained and unrestrained eating. *Journal of Personality* **43**, 647-660.
- Herman, C.P. & Polivy, J. (1975). Anxiety, restraint, and eating behaviour. *Journal of Abnormal Psychology* **84**, 666-672.
- Herman, C.P. & Polivy, J. (1980). Restrained Eating. In Stunkard, A.J. (Ed.), *Obesity*. Philadelphia: Wiley.
- Herman, C.P. & Polivy, J. (1984). A boundary model for the regulation of eating. In Stunkard, A.J. & Stellar, E. (Eds), *Eating and its Disorders*. New York: Raven Press.
- Hilgard, E.R. (1986). *Divided Consciousness: Multiple Controls in Human Thought and Action*. New York: Wiley.
- Kranhold, C., Baumann, U. & Fichter, M. (1992). Hypnotizability in bulimic patients and controls. A control study. *European Archives of Psychiatry* **43**, 129-133.
- McCallum, K.E., Lock, J., Kulla, M., Rorty, M. & Wetzel, R.D. (1992). Dissociative symptoms and disorders in patients with eating disorders. *Dissociation* **5**, 227-235.
- McManus, F. (1995). Dissociation and the severity of bulimic pathology among eating-disordered and non-eating disordered women. *European Eating Disorders Review* **3**, 185-195.
- Nadon, R., Hoyt, I.P., Register, P.A. & Khilstrom, J.F. (1991). Absorption and hypnotizability: Context effects re-examined. *Journal of Personality and Social Psychology* **60**, 144-153.
- Norman, D.A. & Shallice, T. (1980). Attention to action: Willed and automatic control of behaviour. In Davidson, R.J., Schwartz, G.E. & Shapiro, D. (Eds), *Consciousness and Self-Regulation* (vol. 4). New York: Plenum press.

- Oakman, J.M., Woody, E.Z. & Bowers, K.S. (1996). Contextual effects of the relationship between absorption and hypnotic ability. *Contemporary Hypnosis* 13, 19–28.
- Pettinati, H.M., Horne, R.L. & Staats, J.M. (1985). Hypnotizability in Patients with Anorexia Nervosa and Bulimia. *Archives of General Psychology* 42, 1014–1016.
- Rosen, E.F. & Petty, L.C. (1994). Dissociative states and disordered eating. *American Journal of Clinical Hypnosis* 36, 267–275.
- Sanders, S. (1986). The Perceptual Alteration Scale: A scale for measuring dissociation. *American Journal of Clinical Hypnosis* 34, 266–275.
- Spanos, N.P., Gabora, N.J., Jarrett, L.E. & Gwynn, M.I. (1989). Contextual determinants of hypnotizability and of relationships between hypnotizability scales. *Journal of Personality and Social Psychology* 57, 271–278.
- Streigel-Moore, R.H., Silberstein, L.R. & Rodin, J. (1986). Toward an understanding of risk factors for bulimia. *American Psychologist* 41, 246–263.
- Streigel-Moore, R.H., Silberstein, L.R. & Rodin, J. (1993). The social self in bulimia nervosa: Public self-consciousness, social anxiety, perceived fraudulence. *Journal of Abnormal Psychology* 102, 297–303.
- Stunkard, A.J. & Messick, S. (1985). The three factor eating questionnaire to measure dietary restraint, disinhibition, and hunger. *Journal of Psychosomatic Research* 29, 71–83.
- Torem, M.S. (1986). Dissociative states presenting as an eating disorder. *American Journal of Clinical Hypnosis* 29, 137–142.
- Valdiserri, S. & Kihlstrom, J.F. (1995a). Abnormal eating and dissociative experiences. *International Journal of Eating Disorders* 17, 373–380.
- Valdiserri, S. & Kihlstrom, J.F. (1995b). Abnormal eating and dissociative experiences: A further study of college women. *International Journal of Eating Disorders* 18, 145–150.
- Vanderlinden, J., Van Dyck, R., Vandereycken, W. & Vertommen, W. (1993). Dissociative experiences and trauma in eating disorders. *International Journal of Eating Disorders* 13, 187–193.
- Wilson, S.C. & Barber, T.X. (1978). The Creative Imagination Scale as a measure of hypnotic responsiveness: Applications to experimental and clinical hypnosis. *American Journal of Clinical Hypnosis* 20, 235–249.
- Woody, E.Z. & Bowers, K.S. (1994). A frontal assault on dissociated control. In Lynn, S.J. & Rhue, J.W. (Eds). *Dissociation: Clinical Theoretical and Research Applications*. New York; Guildford Press.
- Wybraniec, A. & Oakley, D. (1996). Dietary restraint, hypnotizability, and body image. *Contemporary Hypnosis* 13, 150–155.

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## **HYPNOTIC SUSCEPTIBILITY, OR F-BIAS: ITS RELEVANCE TO EATING DISORDERS**

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### **Abstract**

Hypnosis research and theory has recently paid increasing attention to hypnotizability as a trait in its own right and to a convergence with ideas in neuropsychology. Hypnotizability, or F-bias, may be broadly characterized as involving focused attention, flexibility in switching cognitive styles and the activity of frontal cortical systems. F-bias/hypnotizability correlates with a number of activities other than hypnotic performance, one of which is disordered eating behaviour. Within the clinical literature the general finding has been that restricting anorexics are of normal or slightly above normal hypnotizability whereas bulimics are very significantly above normal hypnotizability and show increased dissociative tendencies. In normal weight non-clinical populations also there is also a positive correlation between hypnotizability, dissociative tendencies and attitudes to food intake. A recent study looked at both dissociation and hypnotizability in relation to disordered eating, as measured by an eating questionnaire, in a normal weight female undergraduate population. The data confirmed that those with bulimic tendencies scored higher on both hypnotizability and dissociation. The results also showed that hypnotizability was specifically related to a factor of dietary restraint, whereas dissociation was related to a factor of impulsive eating. The latter may account for the binge components of disordered eating. In contrast to earlier views, which tended to equate hypnotizability and dissociative tendencies, these data suggest that they are independent factors which influence different aspects of eating behaviour. Other work is described, which indicates that restrained eaters are more responsive than non-restrained eaters to suggestions of increased body size, which may account in part at least for the distortions of body image seen in clinical eating disorders. The ways in which both hypnotizability and dissociative tendencies might operate as independent moderators in a sociocultural model of the development of anorexia and bulimia nervosa are discussed.

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**Key words:** dissociation, eating disorders, dietary restraint, body image

One of the most interesting developments in hypnosis research and theory over the past few years has been an increasing focus on the phenomenon of hypnotizability as a trait in its own right and not merely as a pre-requisite for entering into hypnotic experiences. This perspective derives in significant part from the work of Gruzelier and Crawford and their colleagues (Crawford, 1994; Crawford and Gruzelier, 1992). Hypnotizability in this view may be seen as a reflection of a particular cognitive style or capacity that features an ability to focus and sustain attention and to disattend to extraneous stimuli (which are essential for the planning, execution and evaluation of action). In addition it may involve an ability to switch flexibly between an external focus of attention to an internal focus and from analytic to more holistic processing



styles. The latter perhaps being a core feature of the hypnotic experience itself (Brown and Oakley, 1997).

Equally interesting, and deriving largely from the same source, has been the perception that this represents a convergence with ideas in neuropsychology – in particular with the characteristics of frontal cortical attentional systems and especially with the activities of the Supervisory Attentional System (see Shallice, 1988). There are clear similarities, for example, in the hypnosis literature, on the one hand, between Hilgard's (1992) Central Control Structure (or Executive Ego) and its relationship with subordinate semi-autonomous cognitive structures and, on the other hand, in the neuropsychological literature between the Supervisory Attentional System and lower level schemata.

If this convergence reflects a true underlying identity, some aspects at least of what hypnosis researchers have been measuring via tests of hypnotic susceptibility correspond to what others in neuropsychology have been measuring, particularly as monitors of the integrity of frontal cortical attentional systems, using the Wisconsin Card Sorting Test, the Trails Test and Tower of Hanoi (or Tower of London: Shallice, 1982). We should be able to predict on this basis that individuals with frontal cortical damage would be low hypnotizables (there is, as far as we are aware, no evidence on this but it seems intuitively very likely), that hypnotizability should increase as frontal cortical systems mature (which it does, to peak at age 9–12 yrs, and then declines), and that performance on tests like the Trails Test, Tower of London and Wisconsin Card Sorting should correlate with scores on tests of hypnotic susceptibility. We are not aware that any of these have yet been tested, although there is evidence that other measures of attentional processes, such as those which underlie Necker Cube reversals, which are impaired in frontal cortical pathology, are positively correlated with hypnotic susceptibility (Crawford et al., 1993).

This broader perspective rescues the phenomenon of hypnotizability from the rather parochial (and circular) position of being that measured (innate or acquired) capacity which correlates with those performances and experiences that commonly accompany hypnotic procedures. Hypnotizability tests become just one of possibly many ways of measuring an important aspect of human information processing, reflecting in particular the selectivity and flexibility with which attentional resources can be distributed. It is tempting to reflect this broader perspective and to relabel these core attributes as perhaps 'F-bias'. Where F is for:

- focused attention (and disattention to extraneous stimuli),
- flexibility in switching cognitive styles appropriately, and
- frontal cortical systems, which underlie these cognitive capacities.

We might expect so fundamental a difference in cognitive style to affect many other areas of human activity than simply the capacity for formal hypnotic experience (important and interesting though that is). We do know in fact that F-bias/hypnotizability does correlate with a number of activities other than hypnotic performance and experience. There are correlations with creativity for instance (Shames and Bowers, 1992), with the 'method' style of acting (Hilgard, 1979), with high levels of ability in individual-skill sports (Hilgard, 1979), with multiple personality disorder, hysteria, and PTSD (Bliss, 1986; Groth-Marnat, 1991), with phobias (Crawford and Barabasz, 1993) and eating disorders (of which more below). Interestingly both of the last two relationships are found in non-clinical as well as clinical populations and more commonly in females than in males.

It is also important to recall that several studies have shown that standard measures of hypnotizability (such as the Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A), Shor and Orne, 1962; and the Stanford Hypnotic Susceptibility Scale, Form C (SHSS:C), Weitzenhoffer and Hilgard, 1962) produce low, but significant positive correlations with measures of dissociative ability (such as the Dissociative Experiences Scale (DES), Bernstein and Putnam 1993) when both are administered to normal populations in a hypnotic context, though this has not been a universal finding (see Butler and Bryant, 1997, for a brief review). A small positive correlation has also been found in eating disorder patients between scores on the Dissociation Questionnaire (DIS-Q, Vanderlinden et al., 1993) and the Stanford Hypnotic Clinical Scale (SHCS, Morgan and Hilgard, 1975) by Vanderlinden, Spinhoven, Vandereycken, and Van Dyk (1995). More consistent has been the failure to find a similar correlation when hypnotizability and dissociative ability are measured in independent contexts in normal populations, although one recent study (Butler and Bryant, 1997) reported a significant positive correlation between the DES and HGSHS:A when these were administered independently. Thus whilst it seems clear that the relationship between measures of dissociation and hypnotizability may be influenced by context, as is the relationship between hypnotizability and other factors such as absorption (Oakman et al., 1996), there is enough evidence of their relatedness in some situations to suggest that investigating hypnotizability (or F-bias) independently of other factors, such as dissociation, is unlikely to provide the whole of the story.

With eating disorders in clinical populations the general finding has been that restricting anorexics are of normal or slightly above normal hypnotizability (as measured by the HGSHS:A, SHSS:C, SHCS and the Hypnotic Induction Profile (HIP) (Spiegel and Spiegel, 1978)), bulimics are more markedly above normal hypnotizability and anorexics who binge and purge are somewhere between the two (Barabasz, 1991; Covino et al., 1994; Griffiths, 1993; Pettinati et al., 1985; Torem, 1986; Vanderlinden et al., 1995). In this context of a potential link between hypnotizability and eating disorders in clinical populations it is also worth noting that families who demand excessive conformity have been associated with the development of both anorexia nervosa and bulimia (Bruch, 1977, Minuchin et al., 1978) as well as with heightened hypnotizability in the children of those families (Long, 1968; Shames, 1981).

There is a general consensus that eating disorders of the bulimic type are associated with dissociative tendencies (Covino et al., 1994; Dalle Grave et al., 1996; Everill and Waller, 1995; Vanderlinden et al., 1993). Dissociation is not usually assumed to be a feature of anorexia of the restricting type however, and in line with this view Vanderlinden et al. (1995) found a trend towards higher scores on the Dissociation Questionnaire (DIS-Q, Vanderlinden et al., 1993) in both bulimic and mixed-type anorexics compared with anorexics of the restricting type. This difference was significant when the scores for the 'loss of control' subscale of the DIS-Q were analysed separately. It is also frequently argued that elevated dissociative tendencies are a product of childhood trauma and a number of studies have demonstrated that in clinical eating disorder populations the highest incidence of childhood trauma is found in patients with bulimic symptoms (Dalle Grave et al., 1996; Vanderlinden et al., 1993; Waller, 1991).

In normal weight non-clinical populations (female college students) Groth-Marnat and Schumaker (1990) found a positive correlation between hypnotizability (HGSHS:A), attitudes to food intake (Eating Attitudes Test, Garner et al., 1982) and

fear of becoming overweight (Goldfarb Fear of Fat Scale, Goldfarb et al., 1985). Similarly, Wybraniec and Oakley (1996) and Frاسquilho, Oakley and Ross-Anderson (1998) have reported a positive correlation between hypnotizability as measured by the Creative Imagination Scale (CIS, Barber and Wilson, 1978) and the cognitive restraint factor of the Three Factor Eating Questionnaire (TFEQ, Stunkard and Messick, 1985). Also in normal weight female college students, Rosen and Petty (1994) found a positive relationship between eating disorders (Eating Disorders Inventory, Garner et al., 1983 and the Bulimia Test – BULIT, Smith and Thelen, 1984) and dissociated feelings/loss of control (DES and the Perceptual Alteration Scale – PAS, Sanders, 1986).

A recent study by Frاسquilho and Oakley (1997) explored further the relationship between dissociation (DES) and hypnotizability (CIS) in relation to eating behaviour (TFEQ) in a normal-weight female undergraduate population. They confirmed the earlier observation of a significant positive correlation between hypnotizability and ‘cognitive restraint’ (factor 1 of the TFEQ;  $r = 0.66, p < 0.001$ ) and also found significant positive correlations between dissociation scores and ‘disinhibition of control’ (TFEQ factor 2) and ‘susceptibility to hunger’ (TFEQ factor 3) ( $r = 0.55, p < 0.001$  and  $r = 0.49, p < 0.01$  respectively). As in previous studies using the TFEQ (e.g. Stunkard and Messick, 1985; Williams et al., 1996) no significant correlation was found between the cognitive restraint factor and either of the other two factors, whereas there was a significant correlation between disinhibition of control and susceptibility to hunger ( $r = 0.54, p < 0.001$ ). A good case has been made on the basis of the latter correlation and second-order factor analysis of the subscales of the TFEQ for considering disinhibition of control and susceptibility to hunger as measuring a single higher-order factor of ‘impulsive eating’ (Collins et al., 1992). When the disinhibition of control and susceptibility to hunger scores of the Frاسquilho and Oakley (1997) study are combined in this way as an impulsive eating score there is again no correlation with hypnotizability scores but there is a strong correlation between impulsive eating and dissociation scores ( $r = 0.6, p < 0.001$ ). There was also a positive correlation between the hypnotizability and dissociation measures ( $r = 0.59, p < 0.001$ ) which, although higher than shown in previous studies, is consistent with earlier positive reports in that both measures were administered in the same quasi-hypnotic context, even though the CIS was delivered without a prior hypnotic induction. These results as a whole suggest that although hypnotizability and dissociation may be related in non-clinical populations, they appear to affect different aspects of eating behaviour. In particular it appears that processes underlying dietary restraint may be better understood in the context of hypnotizability, whereas the processes underlying disinhibited eating (binge eating) may be better considered in a dissociative framework.

Although not reported in the Frاسquilho and Oakley (1997) paper, the same study included an additional question set within the TFEQ framework that asked subjects to rate the frequency with which they indulged in uncontrolled binge behaviours (‘Do you go on eating binges where you feel like you can’t stop?’) on a scale of 0 (never) to 3 (at least once per week). When this score is used to form a ‘bulimic tendency’ group ( $N = 13$ ; scoring 1 or more on the additional question) and a control group ( $N = 24$ ; scoring 0) the bulimic tendency group’s score is significantly higher than that of the controls on hypnotizability (CIS: 31.92, sd 3.57 and 19.71, sd 10.42 respectively:  $t = 5.21, p < 0.001$  2-tailed test), dissociative tendencies (DES: 35.85, sd 15.12 and 19.2, sd 15.43,  $t = 3.15, p = 0.003$ ), cognitive restraint (TFEQ factor 1: 15.92, sd 5.87 and 7.00, sd 7.14,  $t = 3.85, p < 0.001$ ) and impulsive eating (TFEQ factors 2 and 3: 17.15,

sd 6.16 and 12.00, sd 4.49,  $t = 2.92$ ,  $p = 0.006$ ). It would appear from this that bulimic tendencies (binge behaviours), at least where they are self-reported in a non-clinical population, involve both dietary restraint and impulsive eating and are associated with high hypnotizability and dissociation scores. It is interesting, however, that within the bulimic tendency group there remains no significant correlation between cognitive restraint and impulsive eating and there is no longer a correlation between hypnotizability (CIS) and dissociative tendencies (DES), indicating once more their relative independence as factors even in a group in which they are strongly associated. It is also interesting that in the bulimic tendency group there is a strong negative correlation between dissociative tendencies (DES) and cognitive restraint of eating (TFEQ factor 1) ( $r = -0.69$ ,  $p = 0.008$ ), which may indicate that, in individuals showing high levels of cognitive restraint, dieting behaviour may be interfered with when dissociative tendencies are also high.

There is then a very strong suggestion from the studies reviewed so far that hypnotizability is specifically related to the tendency, or motivation, to consciously restrict food intake. There is also a suggestion that dissociative ability may account for some aspects of disordered eating – notably the binge components of eating disorders of the bulimic type, which are often associated with feelings of depersonalization, derealization and loss of control (Everill and Waller, 1995). It is also implied by this that although they frequently co-exist (in bulimics for instance) dissociative ability and hypnotizability act as independent factors in determining the nature of an eating disorder. Also of relevance here is the relationship between the three factors in the TFEQ. A central proposal of restrained eating theory (Herman, 1978) is that restraint produces disinhibition and this would lead to the expectation of a positive relationship between the TFEQ factors of cognitive restraint and disinhibition. As noted above, however, this predicted correlation is seldom found. Williams, Michela, Contento, Gladis and Pierce (1996) used the TFEQ in a large normal adolescent sample and found, in common with our own slightly older sample, that overall there was no significant correlation between cognitive restraint and disinhibition. However, when using body weight as a moderator variable, Williams et al. found that for those who are thinner the predicted positive relationship between cognitive restraint and disinhibition is present, whereas for heavier individuals the relationship between the two factors is negative. Equally, Williams et al. found that within the group who could be defined as dieters (i.e. those high on the cognitive restraint factor) there were two subgroups: those who also showed disinhibition (disinhibited dieters) and those who did not show disinhibition (stringent dieters). It was also evident that within the population they studied there were disinhibited individuals who binged but did not show evidence of cognitive restraint of eating (bingers). This study thus supports the view that the factors of dietary restraint and disinhibited eating can vary independently as is being suggested here for the factors of hypnotizability and dissociation. It also seems reasonable to suggest a continuum between dieting and eating disorders (e.g. Hsu, 1990). Extrapolating the Williams et al. data into clinical populations it would be possible to equate bulimics and mixed pattern anorexics with disinhibited dieters, whereas anorexics would correspond to an extreme form of stringent dieter, who perhaps go on to develop a monoideistic disorder as described by Kaffman (1991).

Before considering further how hypnotizability and dissociative ability may be involved in the aetiology and expression of eating disorders, let us look at one other aspect of eating disorder, which is common to both bulimia and anorexia – body image distortion (Smeets, 1997; Williamson et al., 1993). Changes in sensory and perceptual experience, including distortions of body image, are also commonly experienced

by hypnotizable subjects in response to suggestions. It has already been demonstrated that restrained eaters appear to be highly hypnotizable and it might be predicted on this basis that they would more readily undergo distortion of body-image, which may serve as another spur to their weight-regulation activity. This possibility was investigated in a preliminary investigation in a non-clinical, normal weight population by Wybraniec and Oakley (1996), who added two body size items (suggested body size increase and body size decrease) to a modified version of the CIS. As already noted they found the expected positive correlation between hypnotizability and cognitive restraint using the regular CIS items, but they also found a greater tendency for the restrained eaters to experience a suggested body image distortion, particularly in the direction of increased body size. These findings have since been replicated in a more extensive study by Frasnquillo, Oakley and Ross-Anderson (1998) using similar procedures, again in a non-clinical, female student population. The 40 participants were divided into restrained and non-restrained eaters using a median-split based on TFEQ restrained eating subscale scores. Taking the overall (10-item) CIS scores as a measure of hypnotizability (or waking suggestibility) the restrained eaters produced significantly higher scores (mean CIS score, out of a maximum of 40, for restrained eaters = 26.4, sd 5.7 and for non-restrained eaters = 22.3, sd 7.44,  $t = -1.95$ ,  $p < 0.05$ , one tailed). The mean score (out of a maximum of four) for the restraint group on the suggested body size increase item was significantly higher than on the body size decrease item (mean score on increase item 2.95, sd 1.23; decrease 1.90, sd 1.12,  $t = 3.05$ ,  $p = 0.008$ , 2-tailed). However, the scores on the two suggested body size change items were not significantly different in the non-restrained group (increase 1.75, sd 1.25; decrease 1.55, sd 1.32). In addition the restrained group's score on the increase item was significantly greater than that of the non-restrained group ( $t = 3.05$ ,  $p = 0.004$ ), although there was no between-groups difference on the decrease item. The non-restrained group thus appears to have responded equally, albeit moderately, to both the increase and the decrease suggestion. The restrained eating group, on the other hand, appears to have responded similarly to the non-restrained group on the decrease item but very much more strongly to the suggested body size increase item. Selectively greater malleability of body image in the direction of body size increase as a result of suggestion in the restrained eaters is of course consistent with the direction of body image distortion seen in bulimics and anorexics and also with the hypothesis that this distortion is a product of their increased hypnotizability/suggestibility. In addition to between-groups comparisons the data for all 40 participants were entered into a correlational analysis (yielding Pearson's  $r$  coefficients, all controlling for body weight and height via the Body Mass Index, Williamson, 1990). There was the expected overall positive correlation between hypnotizability (CIS) and cognitive restraint (TFEQ factor 1), although this was smaller than in the previous studies ( $r = 0.36$ ,  $p < 0.05$ ), and again no correlation between hypnotizability and impulsive eating (TFEQ, factors 2 and 3). There were significant positive correlations between responses to the body image increase item and cognitive restraint ( $r = 0.53$ ,  $p < 0.001$ ), impulsive eating ( $r = 0.42$ ,  $p < 0.01$ ) and a trait measure of anxiety about body fat ( $r = 0.57$ ,  $p < 0.001$ ) drawn from the Physical Appearance State/Trait Anxiety Scale (Reed et al., 1991). These correlations suggest perhaps that the propensity to experience a distorted, enlarged body image is not only related to hypnotizability and dietary restraint but also to dissociative tendencies, insofar as these are reflected in impulsive eating, and anxiety over body fat. There were no correlations between responses to body size decrease suggestions and any of the other measures. There were, however, significant positive correlations between the

standard CIS (10 item) scores and scores on the body image increase item ( $r = 0.57$ ,  $p < 0.001$ ) and the body image decrease item ( $r = 0.54$ ,  $p < 0.001$ ) as well as between the two body image change items themselves ( $r = 0.48$ ,  $p = 0.002$ ). This seems to suggest that the responses of subjects to these two additional items are closely related to their hypnotizability as a more general trait, though it could simply be a consequence of similar item construction and procedures.

One possibility for reconciling the data from measures of hypnotizability and dissociation on the one hand and the three factors of the TFEQ on the other is to suggest that the hypnotizability scales are measuring attributes in common with the cognitive restraint subscale of the TFEQ and that the DES is measuring among other things the same attribute as the disinhibition subscale and to some extent also the hunger subscale of the TFEQ, which together form a measure of impulsive eating. Concerning the second of these equivalences, it is worth bearing in mind that 'dissociation' is not only not well-defined but is unlikely to prove to be a unitary concept. We may need to think in terms of a distinction, for instance, between 'controlled' dissociative processes such as occur in the course of everyday (adaptive) cognitive activities and which may explain some of the relationship between hypnotizability and measures of dissociative abilities and, 'uncontrolled' or automatic dissociations, possibly trauma-related in many cases, which are of more relevance to binge behaviours and the experiences of those who suffer dissociative identity disorder. These may prove to be two poles of a continuum or may be qualitatively distinct entities. For the time being, however, it is proposed to accept a broad DES/impulsive eating equivalence (this will be referred to below as 'dissociation'). It may be instructive, however, to look a little more closely at the implications of the relationship between hypnotizability (F-bias), cognitive restraint and eating disorders generally. One aspect of F-bias is the suggested relationship with frontal cortical systems, focused attention and the efficient action of some neuropsychological system akin to the Supervisory Attentional System. This would be expected to lead to an increased ability to plan ahead, to evaluate consequences of actions and to apply these abilities in the service of goals, such as adopting and maintaining a strict dietary regime. F-bias in other words should enable the individual to exercise goal-directed control and to maintain that goal-directedness over time, they should be very effective dieters (this will be referred to below as 'control'). However, F-bias, or hypnotizability, is also associated with other characteristics, which may be relevant to the aetiology and maintenance of eating disorders. First, there is 'suggestibility', which may be considered a highly evolved social adaptation in the service of group cohesiveness (Schumaker, 1991), in which case its association with newly evolved frontal systems would make sense. In particular, there is the sort of suggestibility measured by hypnotizability scales that correlates, under some circumstances at least, with so-called 'waking suggestibility', which the CIS may be considered to measure and which may include a responsiveness to, or compliance with, the suggestions of society generally (Gwynn and Spanos, 1996; Wagstaff, 1996). Hypnotizability also implies a greater responsiveness to more specific suggestions, which can affect somatosensory experiences, including perceived body size changes, such as the subjective changes that are experienced in age regressions and those that were described for restrained eaters in the Wybraniec and Oakley (1996) and Frاسquilho, Oakley and Ross-Anderson (1998) studies reported above (this factor will be referred to below as 'body image'). The following is an attempt to integrate the factors of 'dissociation', 'control', 'suggestibility' and 'body image' into a model of the development of eating disorder, which is based closely on the one proposed by Stice (1994) for bulimia.

Stice's (1994) sociocultural model of the development of bulimia nervosa identifies both mediating factors and moderating factors (see Figure 1). The model has as its starting point societal pressures concerning appearance leading via influences from family, peers and the media to internalization of beliefs such as the 'thin ideal'. This reflects the normal process by which individuals incorporate cultural norms. In some cases, however, especially if the individual experiences low self-esteem and identity confusion, this may result in what has been referred to as 'hyperinternalization of the thin-ideal', which is proposed as an essential step in the sociocultural model of bulimia. (Stice, 1994; Striegel-Moore et al., 1986). Hypnotizability might be relevant here as a moderator, by virtue of the highly hypnotizable individual's enhanced susceptibility to the influence of waking suggestion and hence an increased tendency to internalize the messages of society urging a slim body shape (Groth-Marnat, 1991). This is the moderating factor labelled 'suggestibility' in Figure 1. Internalization of the thin ideal leads to body dissatisfaction, especially if the person is objectively overweight. This process might be further enhanced by hypnotizability through body image distortion ('body image' in Figure 1), particularly if this distortion is biased towards an overestimation of body size (Wybraniec and Oakley, 1996; Frasnquillo et al., 1998). It is relevant to note here that when actual body size is controlled for, both bulimics and anorexics show equivalent body image disturbances in the direction of overestimation of current body size (Williamson et al., 1993). Restrained eating emerges as a strategy to meet the societal ideal and to reduce negative affect. As already discussed the effectiveness with which a regime of dietary restraint is conducted should be greater in highly hypnotizable individuals by virtue of their efficient frontal cortical attentional systems ('control' in Figure 1).

Stice's account was concerned only with bulimia and he proposed that individuals follow this route if appropriate family and societal models are available, their coping skills are poor and if they show impulsivity as a trait. In the case of impulsivity, Stice could find little direct evidence to support his proposal that it is a prominent trait in bulimics, although he cites a number of studies which show that bulimics are more likely than normals to indulge in impulsive behaviours such as stealing, substance abuse and self-injury. It is clear, however, that some of this lack of control might be attributed to dissociative tendencies and the idea explored earlier that dissociation might be a specific moderator on the route to bulimia via impulsive eating fits easily into the model at this point ('dissociation' in Figure 1). In view of the putative link between trauma and dissociation, implicating dissociation as a moderator for the development of bulimia is also consistent with the higher incidence of childhood trauma, which has been observed in individuals who later display eating disorders of the bulimic type compared with other eating disorders (Dalle Grave et al., 1996).

The route leading to anorexia in Figure 1 was not incorporated in Stice's original account. However, it seems plausible to suggest that anorexics share the route into restrained eating with the potential bulimics but to also suggest that in the absence of dissociative tendencies they then follow a more direct route into increasingly self-obsessed dietary restraint, especially if they are presented with appropriate models for their behaviour and if their alternative coping skills are poor. This view of course implies that anorexics are as highly hypnotizable in the pre-clinical phase as the prospective bulimics (and in line with what was said above their heightened hypnotizability may derive from an upbringing which stressed conformity and inhibited individuation). There is very little direct evidence to support high pre-clinical levels of hypnotizability in anorexics, although the observation that restrained eaters in normal populations are high hypnotizables is consistent with this if it is accepted that



Figure 1. A sociocultural model of the development of bulimia nervosa and anorexia nervosa showing moderator and mediator variables, modified after Stice (1994). Possible influences of hypnotizability and dissociation as moderator variables are indicated in addition to those proposed by Stice.

dietary restraint is a route into anorexic behaviour. What is needed is a longitudinal study that incorporates measures of both dissociation and hypnotizability. Nevertheless, the view that anorexics are highly hypnotizable in their pre-clinical phase has been promoted by Schumaker (1991), who refers to anorexia as an auto-suggestive disorder, as well as by Groth-Marnat (1991) and Kaffman (1991). The argument is supported by observations (e.g. Bruch, 1977) that preclinically anorexics are compliant and suggestible, whereas once the illness is established they become resistant, and overly-concerned with control, which would make testing for hypnotic susceptibility difficult. It is possibly relevant to note here that some anorexics appear



to prefer, and respond better to, an active-alert induction procedure where they are able to retain greater perceived control as well as to channel their activity (Bányai et al., 1993). Vanderlinden et al. (1995) also note from their own clinical experience that at the beginning of inpatient treatment the anorexic patients are often so emaciated and hyperactive they have difficulty in maintaining concentration and as a consequence they are likely to produce unreliable, low scores on tests of hypnotizability. For this reason, Vanderlinden et al. tested their anorexic patients on average three weeks after admission, when they had put on some weight and had become less motorically overactive, and found that they scored higher than normals, though not significantly so, on a hypnotizability scale (the SHCS). Interestingly, and somewhat counter to the argument being developed here, the anorexics in this study showed no greater resistance than the normal group to being tested for hypnotizability (as measured by the Dutch Resistance to Hypnosis Scale (DRHS), Spinhoven et al., 1993).

The above is clearly not the whole story but it perhaps suggests the utility of considering hypnotizability (or F-bias) as a more general trait and indicates more specifically how it might contribute with dissociative ability to the development of eating disorders.

## References

- Bányai EI, Zseni A, Tury F. Active-alert hypnosis in psychotherapy. In Rhue JW, Lynn SJ, Kirsch I, eds. *Handbook of Clinical Hypnosis*. Washington, DC: American Psychological Association, 1993; 271–290.
- Barabasz M. Hypnotizability in bulimia. *International Journal of Eating Disorders* 1991; 10: 117–120.
- Barber TX, Wilson SC. The Barber Suggestibility Scale and the Creative Imagination Scale: Experimental and clinical applications. *American Journal of Clinical Hypnosis* 1978; 21: 84–108.
- Bernstein E, Putnam FW. An update on the Dissociative Experiences Scale. *Dissociation* 1993; 6: 16–27.
- Bliss EA. *Multiple Personality, Allied Disorders and Hypnosis*. New York: Oxford University Press, 1986.
- Brown RJ, Oakley DA. Hypnosis and Cognitive Experiential Self-Theory: A new conceptualisation for hypnosis? *Contemporary Hypnosis* 1997; 14: 94–99.
- Bruch H. Psychological antecedents of anorexia nervosa. In Vigersky RA, ed. *Anorexia Nervosa*. New York: Raven Press, 1977.
- Butler PV, Bryant RA. Assessing hypnotizability and dissociation in different contexts. *Contemporary Hypnosis* 1997; 14: 167–172.
- Collins RL, Lapp WM, Helder L, Saltzberg JA. Cognitive restraint and impulsive eating: Insights from the three-factor eating questionnaire. *Psychology of Addictive Behaviors* 1992; 6: 47–53.
- Covino NA, Jimerson DC, Wolfe BE, Franko DL, Frankel FH. Hypnotizability, dissociation and bulimia nervosa. *Journal of Abnormal Psychology* 1994; 103: 455–459.
- Crawford HJ. Brain dynamics and hypnosis: Attentional and disattentional processes. *International Journal of Clinical and Experimental Hypnosis* 1994; 42: 204–232.
- Crawford HJ, Gruzelier JH. A midstream view of the neuropsychophysiology of hypnosis: Recent research and future directions. In Fromm E, Nash MR, eds. *Contemporary Hypnosis Research*. New York: Guilford Press, 1992; 227–266.
- Crawford HJ, Barabasz AF. Phobias and intense fears: Facilitating their treatment with hypnosis. In Rhue JW, Lynn SJ, Kirsch I, eds. *Handbook of Clinical Hypnosis*. Washington, DC: American Psychological Association, 1993; 311–337.
- Crawford HJ, Brown AM, Moon CE. Sustained attentional and disattentional abilities: Differences between low and highly hypnotizable persons. *Journal of Abnormal Psychology* 1993; 102: 534–543.
- Dalle Grave R, Rigamonti R, Todisco P, Oliosi E. Dissociation and traumatic experiences in eating disorders. *European Eating Disorders Review* 1996; 4: 232–240.

- Everill JT, Waller G. Dissociation and bulimia: Research and theory. *European Eating Disorders Review* 1995; 3: 129–147.
- Frasquilho F, Oakley DA. Hypnotizability, dissociation and three factors of eating behaviour. *Contemporary Hypnosis* 1997; 14: 105–111.
- Frasquilho F, Oakley DA, Ross-Anderson D. Hypnotizability and body image malleability in restrained and non-restrained eaters. *Contemporary Hypnosis* 1998; 15 (in press).
- Garner DM, Olmsted MP, Bohr Y, Garfinkel PE. The Eating Attitudes Test: Psychometric features and clinical correlates. *Psychological Medicine* 1982; 12: 871–878.
- Garner DM, Olmsted MP, Polivy J. The Eating Disorder Inventory: A measure of cognitive behavioural dimensions of anorexia nervosa and bulimia. In Darby PL, Garfinkel PE, Garner DM, Coscina DV, eds. *Neurology and Neurobiology, Volume 3*. New York: Alan R. Liss, 1983.
- Griffiths RA. The hypnotizability of patients with bulimia nervosa and partial syndromes in a controlled treatment outcome. *Contemporary Hypnosis* 1993; 10: 81–87.
- Goldfarb LA, Dykens EM, Gerrard M. The Goldfarb fear of fat scale. *Journal of Personality Assessment* 1985; 49: 329–333.
- Groth-Marnat G. hypnotizability, suggestibility and psychopathology. In Schumaker JF, ed. *Human Suggestibility: Advances in Theory, Research and Application*. Routledge: New York, 1991; 219–234.
- Groth-Marnat G, Schumaker JF. Hypnotizability, attitudes toward eating and concern with body size in a female college population. *American Journal of Clinical Hypnosis* 1990; 32: 194–200.
- Gwynn MI, Spanos NP. Hypnotic responsiveness, nonhypnotic suggestibility and responsiveness to social influence. In Kunzendorf RG, Spanos NP, Wallace B, eds. *Hypnosis and Imagination*. Amityville, NY: Baywood Publishing Company, 1996; 147–175.
- Herman CP. Restrained eating. *Psychiatric Clinics of North America* 1978; 1: 593–607.
- Hilgard JT. *Personality and Hypnosis: A Study of Imaginative Involvement*. Second Edition. Chicago: University of Chicago Press, 1979.
- Hilgard ER. Dissociation and theories of hypnosis. In Fromm E, Nash MR, eds. *Contemporary Hypnosis Research*. New York: Guilford Press, 1992; 69–101.
- Hsu LKG. *Eating Disorders*. New York: Guilford Press, 1990.
- Kaffman M. Monoideistic disorders and the process of suggestion: Anorexia nervosa as a paradigm. In Schumaker JF, ed. *Human Suggestibility: Advances in Theory, Research and Application*. New York: Routledge, 1991; 289–308.
- Long TE. Some early life stimulus correlates of hypnotizability. *International Journal of Clinical and Experimental Hypnosis* 1968; 16: 61–67.
- Minuchin S, Rosman BL, Baker L, Leiberman H. *Psychosomatic Families: Anorexia Nervosa in Context*. Cambridge, MA: Harvard University Press, 1978.
- Morgan AH, Hilgard JR. The Stanford Hypnotic Clinical Scale. In Hilgard ER, ed. *Hypnosis in the Relief of Pain*. Los Altos, CA: William Kaufmann, 1975.
- Oakman JM, Woody EZ, Bowers KS. Contextual influences on the relationship between absorption and hypnotic ability. *Contemporary Hypnosis* 1996; 13: 19–28.
- Pettinati HM, Horne RL, Staats JM. Hypnotizability in patients with anorexia nervosa and bulimia. *Archives of General Psychiatry* 1985; 42: 1014–1016.
- Reed DL, Thompson KJ, Brannick MT, Sacco WP. Development and validation of the Physical Appearance State and Trait Anxiety Scales (PASTAS). *Journal of Anxiety Disorders* 1991; 5: 323–332.
- Rosen EF, Petty LC. Dissociative states and disordered eating. *American Journal of Clinical Hypnosis* 1994; 36: 266–275.
- Sanders S. The Perceptual Alteration Scale: A scale for measuring dissociation. *American Journal of Clinical Hypnosis* 1986; 34: 266–275.
- Schumaker JF. The adaptive value of suggestibility and dissociation. In Schumaker JF, ed. *Human Suggestibility: Advances in Theory, Research and Application*. New York: Routledge, 1991; 108–131.
- Shallice T. Specific impairments of planning. *Philosophical Transactions of the Royal Society of London B* 1982; 298: 199–209.

- Shallice T. From Neuropsychology to Mental Structure. Cambridge: Cambridge University Press, 1988.
- Shames ML. Hypnotic susceptibility and conformity: On the mediational mechanism of suggestibility. *Psychological Reports* 1981; 49: 563–566.
- Shames VA, Bowers G. Hypnosis and creativity. In Fromm E, Nash MR, eds. *Contemporary Hypnosis Research*. New York: Guilford Press, 1992; 334–363.
- Shor RE, Orne EC. *The Harvard Group Scale of Hypnotic Susceptibility, Form A*. Palo Alto, CA: Consulting Psychologists Press, 1962.
- Smeets MAM. The rise and fall of body size estimation research in anorexia nervosa: A review and reconceptualization. *European Eating Disorders Review* 1997; 5: 75–95.
- Smith MC, Thelen MH. Development and validation of a test for bulimia. *Journal of Consulting and Clinical Psychology* 1984; 52: 863–872.
- Spiegel H, Spiegel D. *Trance and Treatment: Clinical Use of Hypnosis*. New York: Basic Books, 1978.
- Spinhoven P, Vanderlinden J, Ter Kuile MM, Linssen AC. Assessment of hypnotic processes and responsiveness in a clinical context. *International Journal of Clinical and Experimental Hypnosis* 1993; 41: 210–224.
- Stice E. Review of the evidence for a sociocultural model of bulimia nervosa and an exploration of the mechanisms of action. *Clinical Psychology Review* 1994; 14: 633–661.
- Striegel-Moore RH, Silberstein LR, Rodin J. Towards an understanding of risk factors for bulimia. *American Psychologist* 1986; 41: 246–263.
- Stunkard AJ, Messick S. The three-factor eating questionnaire to measure dietary restraint, disinhibition and hunger. *Journal of Psychosomatic Research* 1985; 29: 71–83.
- Torem MS. Dissociative states presenting as an eating disorder. *American Journal of Clinical Hypnosis* 1986; 29: 137–142.
- Vanderlinden J, Vandereycken W, Van Dyk R, Vertommen H. Dissociative experiences and trauma in eating disorders. *International Journal of Eating Disorders* 1993; 13: 187–194.
- Vanderlinden J, Spinhoven P, Vandereycken W, Van Dyk R. Dissociative and hypnotic experiences in eating disorder patients: An exploratory study. *American Journal of Clinical Hypnosis* 1995; 38: 97–106.
- Wagstaff GF. Compliance and imagination in hypnosis. In Kunzendorf RG, Spanos NP, Wallace B, eds. *Hypnosis and Imagination*. Amityville, NY: Baywood Publishing Company, 1996; 19–40.
- Waller G. Sexual abuse as a factor in eating disorders. *British Journal of Psychiatry* 1991; 159: 664–671.
- Weitzenhoffer AM, Hilgard ER. *Stanford Hypnotic Susceptibility Scale: Form C*. Palo Alto, CA: Consulting Psychologists Press, 1962.
- Williams S, Michela JL, Contento IR, Gladis MM, Pierce NT. Restrained eating among adolescents: Dieters are not always bingers and bingers are not always dieters. *Health Psychology* 1996; 15: 176–184.
- Williamson DA. *Assessment of Eating Disorders: Obesity, Anorexia and Bulimia Nervosa*. New York: Pergamon, 1990.
- Williamson DA, Cubic BA, Gleaves DH. Equivalence of body image disturbances in anorexia and bulimia nervosa. *Journal of Abnormal Psychology* 1993; 102: 177–180.
- Wybraniec A, Oakley DA. Dietary restraint, hypnotizability and body image. *Contemporary Hypnosis* 1996; 13: 150–155.

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