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The effect of exposure to a desirable mate on the eating behaviour of single versus committed women according to restraint status: An evolutionary perspective.

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The Effect of Exposure to a Desirable Mate on the Eating Behaviour of Single versus Committed Women According to Restraint Status: An Evolutionary Perspective

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ABSTRACT

The purpose of the study was to investigate an evolutionary model of eating disorders. More specifically, this study tested Riadh Abed's Sexual Competition Theory of Eating Disorders (1998). This theory postulates that eating disorders arise through female intra-sexual competition for males. Specifically, females wish to present themselves as evolutionarily desirable to males (physically attractive, thin), causing some individuals to develop restrained eating patterns. This is important, as restraint is a precursor to disordered eating. Restraint refers to replacing internally regulated (hunger driven) eating with planned, cognitively determined eating or dietary restraint with the goal of weight loss or preventing weight gain. According to Abed's model, single women who have not yet found a mate are expected to eat less. Furthermore, because restrained eaters are more weight schematic, single restrained women are expected to eat even less. The hypotheses put forward were that all females would eat less in the presence of a desirable than in the presence of an undesirable potential mate, single females would eat less than committed females, and restrained, single females will eat the least of all groups. A total of 130 undergraduate students were randomly assigned to be exposed to descriptions of either two evolutionarily desirable mates or two evolutionarily undesirable mates. Participants were asked to choose between the two different mates and were given a bowl of pre-counted, pre-weighed M&Ms to snack on during this procedure. Results revealed a two-way interaction where single women who were exposed to the evolutionarily desirable mate ate the least amount of M&Ms. Contrary to expectations, restrained eaters ate more than unrestrained eaters.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1

INTRODUCTION

Overview

Context of the Problem

Of all psychiatric disorders, eating disorders (ED) have, until recently, received the least amount of attention. The past two decades have reflected health practitioners' battle to eradicate the ignorance and secrecy surrounding this potentially life-threatening disorder. As Hoek (1993) points out, "in recent years there has been such an increase in the registered incidence of eating disorders that some people are suggesting there is an 'epidemic'." This increase in eating disorders is very serious given that it has the highest mortality rates of all mental disorders. A review by Herzog, Keller, and Lavori (1988) showed eating disorder mortality rates ranging from 0-22%, with 50% of the deaths attributable to Anorexia Nervosa or its medical complications and 24% to suicide. Along with possessing the highest mortality rates, eating disorders also carry the distinction for the most imbalanced sex ratio known to psychiatry (Gordon, 1990). As presented in the Diagnostic and Statistical Manual – Fourth Edition, Text Revision (DSM-IV-TR), "more than 90% of cases of Anorexia Nervosa are occurring in females (American Psychological Association, 2000)," and Woodside and Kennedy (1995) have seen this percentage reach 95%.

Several explanations have been proposed for the rise in eating disorders. The evolutionary hypothesis suggests that eating disorders may arise from competition among women for access to evolutionarily desirable mates. A brief overview of the evolutionary theory and its applicability to ED follows. Then, the relationship between evolution,

mate selection, and eating disorders will be discussed. Finally, the current theories of eating disorders will be addressed, as will the role that restraint plays in eating disorders.

Definitional/Conceptual Issues

Evolutionary Definitions

The terms "proximate" and "ultimate" causation are both evolutionary terms and refer to the level of importance of a theory. Behaviour has both proximate and ultimate causes, where proximate causation is concerned with the environmental stimuli that trigger behaviour, and ultimate causation is concerned with the evolutionary significance of the behaviour. An example to distinguish between the two would be the various reasons that cats purr. Specifically, when cats purr because they're contented, it is a proximate cause. On the other hand, cats can also purr to receive more attention from their mother. This increased attention is likely to help them live longer and therefore, to have more offspring, enhancing their chances of reproducing and passing on their genes. Therefore, survival and reproduction are the ultimate cause of purring.

The process of sexual selection also contains two terms: inter-sexual and intra-sexual competition. Specifically, inter-sexual competition involves both sexes, where members of one sex have a consensus about the desirable characteristics of the opposite sex, prefer those individuals with the desired characteristics, and compete for them (Buss, 1995). Intra-sexual competition consists of contests between members of one sex, where the winner of the contest gains preferential access to members of the opposite sex (Buss, 1995).

Theoretical Models and Issues

Evolutionary Theory and Sexual Selection

Evolutionary Theory focuses on the adaptive problems faced by our ancestors and on the adaptive psychological and biological solutions to these problems (Buss, 1999). General Evolutionary Theory is understood as including fitness theory and it describes the process of evolution by changes that increase the likelihood of producing viable offspring and the likelihood that one's genetic kin will produce offspring (Buss, 1999). Three major theories have been derived from the general theory of evolution: the theory of Parasite-Host Co-evolution, the theory of Reciprocal Altruism, and the theory of Parental Investment and Sexual Selection. The current research is concerned with the theory of Sexual Selection.

There are two main postulates in the theory of Sexual Selection. The first postulate is that in species in which the sexes differ in parental investment, the higher investing sex will be more selective in choice of mating partners. The second posits that where males contribute resources to offspring, females will select mates in part based on their ability and willingness to contribute resources (Buss, 1999). In humans, the first postulate is met because as part of a mammalian species, women invest more due to the burden of a long pregnancy and the long commitment to nursing and child care thereafter. Secondly, females will select mates based on their willingness to contribute resources because dyads where males contribute resources are advantaged in raising offspring. It follows that women have evolved mate preferences for males who are both able and willing to contribute resources to them and their children, a hypotheses that has been overwhelmingly supported by past research (Davis, 1990; Wiederman, 1993). In short,

females who are looking for a male to produce their children, and consequently pass on their genes, will greatly benefit from selecting a male who is likely to commit financial, material, emotional and social resources and who would be a good parent to their children (Buss et al., 1990). Therefore, the more resources a man has, the more likely women are to compete for his attention (Barash & Lipton, 2002). Furthermore, the more an organism invests in reproduction, the more it has to lose by making a bad mate choice (Buss et al., 1990). Thus, the best reproductive strategy for human females is to choose a mate who can contribute high quality genetic material and physical resources. Research has demonstrated that these female preferences for commitment of resources is best assessed through the social status, older age, ambition, dependability, and health of potential male mates (Buss et al., 1990). Finally, of secondary importance to resource provisions, women also look for signs of good genetic material in a male, and wish to combine their genes with those of a very fit looking male, which is an expression of his good quality genes. These good quality genes will contribute to the survival of the offspring and therefore, of the females' own genes.

It has been noted in past research that in species where males can successfully reproduce with little or no parental investment, they copulate with as many females as possible, adopting a short-term mating strategy that increases their chances of passing on their genes (Trivers, 1972). However, history has also revealed five potentially powerful adaptive benefits to males who are willing to commit their resources to a long-term mate (Buss et al., 1990). Specifically, committing increases their odds of being able to successfully attract a desirable female who can afford to carefully chose and will therefore focus on males willing to invest further than short-term commitment. Also, if

males choose a long-term mate, they will have increased paternal certainty, increased survival chances for their children, and increased reproductive success (Buss et al., 1990).

To be reproductively successful, a key issue for males, when looking for a long-term female, is to ensure that she has the capacity to bear children (Buss et al., 1990). Males who are looking for a female to produce their children, and consequently pass on their genes, will greatly benefit from selecting a female who is likely to be fertile and who would be a good parent to their children (Buss et al., 1990). Research has demonstrated that in females, high reproductive value is best assessed through the characteristics of youth and physical attractiveness, which serve as good indicators of health (Abed, 1998; Buss et al., 1990; Wiederman, 1993).

Mate Selection and Evolutionarily Desirable Mate Characteristics – Empirical Support

Much of the past research on mate selection and evolution has concentrated on personal advertisements and characteristics that females and males both display and seek (Buss, 1989; Buss, 1995; Buss et al., 1990; Davis, 1990). Townsend and Levy (1995) documented in a laboratory study, the influence of potential partners' costume and physical attractiveness on partner selection. Specifically, they manipulated the visual Social Economic Status (SES) of individuals by photographing them in either a Burger King Uniform (low SES) or designer clothes with the addition of a Rolex watch (high SES). Participants were told that they were participating in a study of how people choose partners for dating and marriage and were asked to examine these pictures, rate them, and indicate their willingness to enter various types of relationships with them. As predicted, and congruent with evolutionary theory, men sought out physically attractive women, whereas women sought high levels of investment, evidenced by the perceived financial

resources of the high SES males. The study also revealed that female participants needed more information to decide whether they would be interested in higher levels of relationships aside from physical attractiveness. The researchers hypothesized, based on past studies, that cues to the partners' ability and willingness to invest the time, material resources, and emotions required in serious relationships and marriage would be important.

To sum, it has been argued that the best strategy for males in a mammalian species who wish to pass on their genes is to reproduce as much as possible with females because the females' presence is a requirement to care for the offspring and the males' presence is not. However, in humans this is moderated by the fact that offspring cared for by both parents have improved chances of survival. This results in a diverse reproductive strategy where males tend to strike a compromise between settling on one mate and committing resources, and still attempting to pass on their genes as much as possible by attempting to mate with as many women as possible.

The Etiology of Eating Disorders

Currently, the DSM-IV-TR has defined two types of eating disorders, Anorexia Nervosa (AN), and Bulimia Nervosa (BN). Although both disorders have been documented to exist for centuries (Parry-Jones & Parry-Jones, 1995; Silverman, 1995), it is only recently that specific ED diagnostic criteria have been proposed (See Table One). Broadly speaking, AN is characterized by a refusal to maintain a minimally normal body weight, an intense fear of gaining weight, denial of the seriousness of the current low body weight, and an absence of menstrual cycles for three consecutive months in post

Table 1.

Diagnostic Criteria of Eating Disorders

Eating disorder	**Diagnostic criteria**	**Specifier**
Anorexia Nervosa	-Maintains a body weight ≤ 85% of what is considered normal for their age and height, and refuses to gain weight. - Intense fear of gaining weight or becoming fat, even though underweight - Disturbances in the way in which one's body weight and shape is experienced, with denial of the seriousness of the current low body weight - In post-menarcheal females, amenorrhea (absence of 3 or more consecutive periods)	Restricting Type- not regularly engaging in binge-eating /purging Binge-Eating/Purging Type- regularly engages in binge-eating or purging behaviour
Bulimia Nervosa	-Recurrent episodes of binge-eating that occur on average twice weekly over 3 months, characterized by both: 1. Eating in a 2-hr period an amount of food that is > than most people would eat during the same time-period. 2. a sense of lack of control over eating during the episode -Recurrent inappropriate compensatory behaviour to prevent weight gain. -Self-evaluation is unduly influenced by body shape and weight, and the disturbance doesn't occur during anorexia.	Purging Type- regularly engaging in self-induced vomiting or laxative, diuretic, or enema misuse. Non-Purging Type- uses other inappropriate compensatory behaviours (fasting, excessive exercise), instead of purging methods.
Eating Disorder – NOS	For females, all criteria of: Anorexia is met, except: - they continue to menstruate and their body weight is still in normal range. Bulimia is met, except: - that binge-eating and inappropriate compensatory behaviour occur < 2/week, or for a duration < 3 months or they repeatedly chew, spit out, and not swallow large amounts of food, or they engage in inappropriate compensations, after consuming small amounts of food. Also includes binge-eating by itself.	

menarcheal females, although this criteria is to be abandoned in the next edition of the DSM-IV-TR (American Psychological Association, 2000). BN is characterized by twice weekly episodes of binge eating for at least three months followed by inappropriate compensatory behaviours such as self-induced vomiting; misuse of laxatives, diuretics, or other medications, fasting, or excessive exercise, and a sense of a lack of control over eating during the episodes (American Psychological Association, 2000). Both AN and BN have specifiers which are located in Table One.

The etiology of AN and BN is generally considered to be multi-factorial with no one etiological factor in isolation being sufficient to account for the development of the disorders (Cooper, 1995). As Abed (1998) points out, the many current theories can be classified broadly into biological, socio-cultural, and psychological theories and are considered proximal causes. In other words, Abed (1998) argues that these theories serve as proximal causes, concerned with the environmental stimuli that trigger disordered eating behaviour, whereas none of the current theories function as evidence of ultimate causation which concerns the evolutionary significance of the behaviour.

Biological theories have offered many suggestions for the existence of eating disorders, such as early feeding difficulties and pre-morbid obesity serving as predisposing factors for AN (Cooper, 1995). Other research has revealed findings that are consistent with genetic and biological explanations as well. Specifically, AN and BN appear to be several times more common among biological relatives of Anorexia and Bulimia patients than in the general population, a finding that implicates the existence of some genetic mechanism of transmissibility of illness within families (Strober, 1995). Finally, Gatward (2001) posited that ancestral individuals with the ability to tolerate

starvation as a trait would be more likely to survive famine and be more attractive to mates, ensuring that the genes remain in the population. Those women who could demonstrate 'anorexic qualities' as a survival mechanism may have been widely sought after as mates. Thus, the ability to starve oneself in times of need was selected for.

Another popular theory that has produced an explosion of research identifies societal influences as a cause of eating disorders. The concept is that females are exposed both directly (parents, peers, and colleagues), and indirectly (media, magazines, and movies) to thin females. This fosters body dissatisfaction and can eventually lead to eating pathology (Stice & Whitenton, 2002). Also, research conducted by Davison, Markey, and Birch (2000), identified a preference for thinness among children of increasingly younger ages, and revealed that females as young as 5-years old were aware of perceptions of bodily attractiveness, and expressed a desire to be thin.

In the past forty years, the dominant body shape of fashion models, Playboy Centerfolds, and Miss America contestants has changed from a full figure to a thin waif-like figure (Morris, Cooper, & Cooper, 1989; Wiseman, Gray, Mosimann, & Ahrens, 1992). At the same time, research throughout North America and across all age groups, has revealed a preference for this shape change, with individuals expressing an overwhelming partiality for thin female figures (Markey, Tinsley, Ericksen, Ozer, & Markey, 2002; Thompson & Chad, 2002). These findings have direct relevance to the rising numbers of females who experience disordered eating.

Past research has strongly supported social pressure and peer influence to be thin as major factors that precede disordered eating. Specifically, girls who viewed themselves in the eyes of their peers believed that if they were thinner and more

attractive, they would be popular with both opposite-and same-sex peers, and girls who were nominated by their peers as being popular had lower body esteem and engaged in disordered eating (Lieberman, Gauvin, Bukowski, & White, 2001). Also, research by Dion, Berescheid, and Walster (1972) revealed that subjects assumed that an attractive individual was more likely to find an acceptable partner than those individuals who were perceived as less attractive. When taken together these findings reveal that women experience pressure from their peers to be thin, realize that thinness is attractive, and feel that attractive women will have greater chances of finding a mate.

Finally, psychological theories of eating disorders have also been formulated but have received only moderate empirical support. An example of a psychological theory would be that stressful life events serve as predisposing factors for both AN and BN sufferers (Cooper, 1995). These events could have positive/neutral connotations such as the onset of puberty, leaving home, and the beginning of new relationships, or negative connotations such as the death or illness of a loved one or the loss of a job (Cooper, 1995).

Abed (1998) suggests that the above theories dealing with proximate causation are compatible with the Sexual Competition Hypothesis for Eating Disorders that is posited to be an ultimate cause. This will be explored below.

Eating Disorders and Evolution - Abed's Sexual Competition Hypothesis for Eating Disorders

Current theories have offered proximal explanations to the existence of eating disorders. Although they definitely function to explain some aspects of eating disorders, each theory on its own fails to offer an ultimate explanation for the development and

maintenance of eating disorders. Abed's Sexual Competition Theory for Eating Disorders is based upon the contention that the changing norms for female physical attractiveness in modern industrialized societies have arisen from the interaction of an ancient biological strategy and a novel environment (1998). He posits that our human ancestors survived because they possessed the sexual selection strategies outlined by Buss, and passed these strategies on to future generations. Thus, armed with the strategies from our forefathers to attract evolutionary desirable mates, males will advertise resources and females will advertise physical attractiveness and youthful characteristics, thereby increasing their odds of reproducing. Therefore, Abed hypothesized that eating disorders originate in the human females psychological adaptation of concern about physical attractiveness, which is an important component of female 'mate attraction' and 'mate retention' strategies (1998).

Historically, women's bodies provided visual evidence of both age and child bearing capacity, whereas currently, older women are maintaining a shape that demonstrates high reproductive potential for longer periods of time (Abed, 1998). This is due in large part to the increasing control that older women have over their body shape and size through surgical procedures and fitness training (Abed, 1998). Also, modernization brought people to large cities out of segregated tribes. This increased women's exposure to other women, both directly through increased interactions, and indirectly through media broadcasts (Abed, 1998). Furthermore, in ancestral times, women had little control over their mate choices by virtue of arranged marriages or daughter guarding (Abed, 1998). Currently, most women have unbridled control over their dating behaviour and marriage choices, but also face the increasing instability of

long-term mateships with the rise of divorce rates almost reaching 50% (Abed, 1998; Peck, 1993).

When taken together, all of these factors have led to a progressive increase in the importance of body shape within the process of female intra-sexual competition. Now young women not only find competition with their peers, but also with older women who still have the capacity to compete and who may also be looking for potential mates (Abed, 1998). Thus, Abed posits that young women who want to attract evolutionarily desirable mates partake in increased intra-sexual competition and therefore, may set their body template at an abnormally thin shape to try and out-do the other females. Taken to the extreme, this strategy may result in Anorexia Nervosa (Abed, 1998). Conceivably, these females do not have a conscious awareness of their actions, because evolution would utilize powerful emotions such as anxiety, guilt, and depression to ensure the implementation of this mating strategy (Abed, 1998).

Definition of Restraint

The term restraint is defined as replacing internally regulated (hunger driven) eating with planned, cognitively determined eating or dietary restraint with the goal of weight loss or preventing weight gain (Polivy & Herman, 1995). Thus, a restrained eater is operationally defined as one who ignores internal cues of hunger and satiety to adhere to a calorically reduced eating plan that will presumably lead to weight loss (Polivy & Herman, 1995). Restraint is reliably measured using the Revised Restraint Scale (Herman & Polivy, 1980).

Eating Disorders and Restraint

As Polivy and Herman (1995) point out, the eating behaviour of restrained eaters has repeatedly been shown to differ in important respects from the eating behaviour of unrestrained eaters. Restrained eaters monitor their food intake cognitively instead of tuning into their internal hunger states. They also seem to be insecure and uncertain of themselves, compared to unrestrained individuals (Polivy & Herman, 1995). The link between dieting and the development of an eating disorder in a susceptible individual is so widely recognized that eating disorders have been referred to in some recent papers as 'dieting disorders' (Polivy & Herman, 1995). Polivy and Herman also point out that many of the characteristics of dieters apply, in a more extreme form, to patients exhibiting eating disorders (1995). Thus, the evolutionary mate selection theory of eating disorders may apply to restrained eaters because like those with eating disorders, dieters are weight schematic, and are therefore more likely to be further invested in interpersonal strategies that rely on thinness and attractiveness.

Abed's Sexual Competition Hypothesis and Restraint

One of the key claims of Abed's Sexual Competition Hypothesis is that females' intra-sexual competition in these new ecological conditions (increased female independence, short-term mate strategies) leads to a drive towards relative thinness (1998). This is because the display of high mate value is primarily a display of reproductive potential, which is evidenced by a thin shape. A female engages in dietary restraint to achieve this shape and this engagement in dietary restraint is an integral step of Abed's theory. Explicitly, females pass through this step directly before they spiral into the extreme form, which he hypothesized to be eating disorders (Abed, 1998). It is

important to note that all females will be subjected to this force of evolution, but dieters may be more susceptible. Demonstrating the existence of this behaviour in females who are weight schematic would provide further support for Abed's theory.

Social Influence and Food Consumption

A myriad of studies have demonstrated that social situations have an effect on individuals' eating behaviour (Chaiken & Pliner, 1987; Clendenen, Herman, & Polivy, 1994; Copeland, Woods, & Hursey, 1995; De Luca & Spigelman, 1979; Herman, Polivy, & Silver, 1979; Mooney, DeTore, & Malloy, 1994; Mori, Chaiken, & Pliner, 1987). Clendenen, Herman and Polivy (1994) showed that participants ate less dessert when paired with a stranger then when eating with friends, indicating that the relationship of dining companions is an important factor contributing to social facilitation/inhibition. It could suggest that individuals have already assessed their opposite sex friends as potential mates and dismissed them as unsuitable, whereas strangers are still considered potential mates. Also, Chaiken and Pliner (1987) demonstrated that women are judged by the amount of food that they consume. Specifically, both males and females considered a female target who ate smaller meals to be significantly more feminine, less masculine, more concerned about her appearance, better looking, and more likely to possess stereotypically feminine personality traits. This finding suggests that women may be motivated to restrict their food intake and chronically maintain a low body weight to appear feminine (Chaiken & Pliner, 1987).

Krantz (1979) demonstrated that overweight individuals purchased less food in a university cafeteria when accompanied by others, a finding he attributed to weight consciousness and perceived social pressures. Similarly, a study by Lee and Goldman

(1979) revealed that being 'stared at' while eating resulted in obese individuals departing from the room significantly faster than non-obese individuals.

Social Influence on Food Consumption and Desirable Mate Studies

These findings that social influence lowers food consumption in both normal weight and obese individuals also holds true for individuals who are eating with members of the opposite sex. In particular, Pliner and Chaiken's (1990) had participants eat a meal in the presence of an attractive male or female confederate, and found an overall effect where participants ate less in the presence of a partner of the opposite sex. Similarly, a study by Mori, Chaiken, and Pliner (1987) revealed that while in the presence of a physically desirable male, females ate less than females paired with a physically undesirable male or a same sex partner. Restraint was not examined in these studies.

Social Influence on Food Consumption and the Role of Restraint

A study by Polivy, Herman, Younger and Erskine (1979) demonstrated that restrained eaters were susceptible to social factors. Specifically, they found that restrained and unrestrained eaters differed significantly in amounts eaten, with restrained eaters consuming less than the unrestrained eaters when paired with overeaters or dieters. Finally, a study by Copeland, Woods, and Hursey, (1995) demonstrated that the eating of average restrained women was significantly depressed following interaction with a partner whom subjects considered physically attractive. Currently, in the literature, no studies have examined the effect of mate desirability on restrained eater's eating behaviour beyond physical attractiveness.

When taken together, it is clear that a relationship exists between an individual's food consumption and their social situation. More important to the current study, there is

past support that restrained and unrestrained eaters, when placed in the presence of a physically desirable member of the opposite sex, will restrict their eating behaviour. However, the studies described above do not provide a complete test for the evolutionary explanation because they did not manipulate evolutionarily meaningful variables in males beyond physical attractiveness. The current study will directly test an evolutionary model of restrained eating by directly manipulating evolutionarily desirable mate characteristics such as possessing resources and being willing to share them. The effect of exposure to these characteristics on women's eating behaviour will be examined. The first aspect examined will be the evolutionary theory of sexual selection, which argues that women prefer mates who possess evolutionarily desirable qualities. The current study will serve to verify past research which has demonstrated that physical attractiveness being equal, women both prefer and choose mates who demonstrate the best evolutionary qualities (Buss, 1989; Buss, 1990; Davis, 1990; Wiederman, 1993).

Purpose of the Proposed Research

Rationale and Background

A number of hypotheses derive from Abed's (1998) explanation of eating disorders. In order to confirm or disprove the proposition that eating disorders arise ultimately from Darwin's sexual selection theory, the predictions and hypotheses derived from this theory need to be empirically tested. Broadly, Abed posits that eating disorders arise from increased intra-sexual competition between females for evolutionarily desirable mates. Specifically, he stated that current conditions have increased females' ability to both control their body shape and their mating behaviour, creating a more

competitive environment where ultimately, some females succumb to the competitive pressures and develop Anorexia Nervosa (Abed, 1998).

From Abed's theory, a two-step model became evident, whereby the current research will test the first corollary of the model. If Abed's Sexual Competition Theory is correct, when confronted with a situation where a potential mate meets evolutionarily desirable criteria, a female should want to communicate to him that she is evolutionarily desirable as well. It can be hypothesized that she would restrict her eating given that physical attractiveness serves as one of the key markers for females' reproductive potential, and given that thinness is itself a key marker of attractiveness.

Thus, it would need to be proven that females will restrict their eating when exposed to an evolutionarily desirable mate. It also follows that women should not restrict their eating in the presence of an evolutionarily undesirable mate. As well, according to evolution, single females should restrict their eating more than those females who are in a happy, committed relationship. This finding should further be moderated by individuals' restraint status, such that the single dieters are expected to eat less than single non-dieters. Restrained eaters should be more susceptible to this manipulation than unrestrained eaters. Of most importance is that they both pursue and value thinness in general but restrained eaters do so to a much greater extent. It thus follows that they are the ones more likely to restrict their eating in the presence of a desirable mate, as they are more likely to see thinness as a necessary condition than would unrestrained eaters. As well, research shows that their eating is more susceptible to social influence than that of unrestrained eaters (Polivy et al., 1979) and that they do restrict more than unrestrained eaters in the presence of an attractive male (Copeland et al., 1995). Finally, dieting

precedes ED in the vast majority of cases of ED. It thus makes sense that those who are likely to end up sick would start by being restrained. Therefore, restrained eaters should show this pattern of diminished eating in front of an evolutionary desirable mate to a greater extent than unrestrained eaters.

The Research Question

As previously noted, females want to communicate to potential mates their relative physical attractiveness and fitness because it serves as a signal for reproductive capacity (Abed, 1998). If this is true, will women placed in a lab situation that induces the idea of 'a desirable mate' decrease their eating? Specifically, will all women decrease their eating in the presence of an evolutionarily desirable mate, and will restrained eaters do so to a larger extent? Also, because evolutionary theory deals directly with mate selection, it is assumed that those participants in a committed relationship have already fulfilled their evolutionary tasks, and thus will not decrease their eating as much as single participants.

Hypothesis 1 (Evolutionary Desirability of the Mates)

Participants' rating of the evolutionary desirable mates will be significantly higher, and thus more favorable, than participants' ratings of the evolutionary undesirable mates.

Hypothesis 2 (Predicted Interaction)

Based on strong evidence for the existence of intra-sexual competition, the present study's participants were expected to eat less when exposed to an evolutionarily desirable mate. The main hypothesis was that single, restrained females who were exposed to descriptions of evolutionarily desirable mates would eat the least. Below is a description of specific predictions for cell differences for the main hypothesis which

posits that all females will eat less in the presence of a desirable than in the presence of an undesirable mate, single females will eat less than committed females, and restrained, single females will eat the least of all groups.

Hypothesis 3 (Mate Status, Desirable vs. Undesirable):

Females who are exposed to a desirable mate will eat significantly less than females who are exposed to an undesirable mate.

Hypothesis 4 (Relationship Status, Single vs. Committed):

Single females will eat significantly less than committed females during the mate exposure.

Hypothesis 5 (Restraint Status, Restrained Eaters vs. Unrestrained Eaters):

Restrained females will eat less than unrestrained females during the mate exposure.

Table 2 contains a summary of the planned hypotheses.

Table 2.

Summary of Study Hypotheses and Proposed Analyses

Hypothesis	Variables to be used in testing the hypotheses	Analysis used
H1. Evolutionary Desirability of the Mates: Participant's rating of the evolutionary desirable mates will be significantly higher, and thus more favorable, than participant's ratings of the evolutionary undesirable mates.	Criterion Variable is the mate description. Independent Variable is the scores on the five point scale of the partner questionnaire.	Independent T Test. Grouping Variable is the Mate Description.
H2. Predicted Interaction Restrained, single, females will eat the least of all groups.	Criterion Variable is amount of M&M's consumed. Independent Variables are the scores on the Relationship Assessment Scale, and the Revised Restraint scale.	Analysis of Covariance. Covariate is Body Mass Index (BMI). Criterion variable is amount of M&M's consumed.
H3. Mate Status: (Desirable vs. Undesirable): Females who are exposed to the desirable mates will eat less than females who are exposed to an undesirable mate.	Criterion Variable is amount of M&M's consumed. Independent Variable is the desirability of the mate.	Analysis of Covariance. Covariate is Body Mass Index (BMI). Criterion variable is amount of M&M's consumed.
H4. Relationship Status: (Single vs. Committed): Single females will eat less than committed females in all mate conditions.	Criterion Variable is amount of M&M's consumed. Independent Variable is the scores on the Relationship Assessment Scale.	Analysis of Covariance. Covariate is Body Mass Index (BMI). Criterion variable is amount of M&M's consumed.
H5. Restraint Status: (Restrained Eaters vs. Unrestrained Eaters): Restrained females will eat less than unrestrained females in all mate conditions.	Criterion Variable is amount of M&M's consumed. Independent Variable is the scores on the Revised Restraint Scale.	Analysis of Covariance. Covariate is Body Mass Index (BMI). Criterion variable is amount of M&M's consumed.

Chapter II

METHOD

Participants

One hundred fifty seven females were recruited at the University of Windsor, from the undergraduate participant pool. A computer generated random list was utilized after controlling for age, gender, relationship status, and the presence of eating pathology. Only females under the age of 25 years who did not identify a current or past diagnosis of an eating disorder were invited to participate in the study. Seventy-two of the 157 participants met the requirement of being involved in a committed relationship with a minimum duration of one year, and constituted the "committed" group.

The mean age of participants was 21.11 years (*SD* = 1.26). Age of participants ranged from 17 to 25 years of age. Participants identified themselves as follows: 53.1% were Caucasian, 7.7% were Asian, and 3.1% were African. A percentage of participants self identified ethnicity utilizing the nationality Canadian (12.3%), and the nationality European (17.9%). Finally, a small proportion (2.4%) were collapsed into a category labeled "other", and 3.9% did not specify their ethnicity.

In terms of religious affiliation, 74.5% were Christian, 6.2% self-identified with other religions, 18.5% identified themselves as having no religious affiliation, and .8% did not specify. In terms of years in university, the majority of participants were enrolled in their third year of university (36.9%), with 30% enrolled in second year, 23.8% enrolled in fourth year, 7.7% enrolled in first year, and 1.6% enrolled in school longer than four years. Also, in terms of school majors, the majority (42.3%) of participants were psychology majors, followed by 16.2% of family and social relations majors, and

6.9% of criminology majors. The remainder of majors endorsed included 20.1% in the arts, 6.2% in health related fields, 3.8% in Business, 1.5% in Science, and 3.1% who did not specify. Finally, none of the participants endorsed homosexuality on the demographic questionnaire.

Group Assignment

For the purposes of this study, there were two categories for the independent variable of relationship status with the defining distinction being length of relationship. One year is a common distinction in relationship research that divides committed individuals in relationships from single individuals (Florian, Mikulincer, & Hirschberger, 2002; Hendrick, 1988). Thus, the category of *committed* is defined as being in a long-term relationship for a period equal to or greater than one year, and the category of non-committed is defined as single or in a relationship for less than one year. Both the committed and non-committed participants were randomly assigned to either the desirable mate condition or the undesirable mate condition.

The other independent variable "restraint" is a subject variable that was measured with the Revised Restraint Scale (Herman & Polivy, 1980). Similar to prior studies (Ogden, 1993; Polivy et al., 1979) participants were designated as restrained or unrestrained on the basis of the revised restraint scale, which was administered after the experimental procedure.

Materials

Consent Form

Each participant was asked to sign a consent form indicating that they were participating freely in the study, were aware that they could withdraw at any time if they felt discomfort, and were treated in accordance with ethical principles for research with

human participants (Appendix A). As well, an additional consent form was administered at the end of the study, after the debriefing, where participants agreed to have their height and weight taken (Appendix B). All participants received two bonus points for their participation in the study and were briefed on the confidentiality of the research. Table three contains a summary of the measures that were utilized in this study.

Mate Description and Questionnaire - Experimental Manipulation

The materials consisted of two packages, each with two mate descriptions. Package A contained two desirable mate descriptions and Package B contained two undesirable mate conditions (see Appendix C for the mate description package for all four mates). The mate descriptions and accompanying photographs have been pilot tested with a small sample. Results of the pilot testing revealed that the mates were correctly classified in their respective categories of evolutionarily desirable and evolutionarily undesirable mates. As well, both were considered above average in physical attractiveness. The pictures remained the same for both the desirable and undesirable mate conditions, as appearance is not an independent variable in this study. Exactly half of the committed and single participants randomly received Package A containing the desirable mate descriptions, and the other half randomly received Package B with the undesirable mate descriptions. After reviewing the two mates, participants were asked to choose which mate they would prefer, and to complete two questionnaires addressing their reasoning (Appendix D). The first questionnaire assessed participant's ratings of importance for a list of mate characteristics. Ratings were made on a 5-point Likert scale where 1 = "not at all important" and 5 = "extremely important." The second

Table 3.

Measures, Descriptions, Origin, and Psychometric Properties

Measure	Description/Variables	Origin & psychometric properties
Mate Questionnaires	21 item questionnaires that rate the importance of mate characteristics in general and in relation to their mate choice.	Created for study based on Buss' evolutionary theory.
Demographic Questionnaire	Demographic information, including age, gender, SES, religious affiliation, ethnicity, school information, sexual orientation, and dietary habits.	Created for study.
Eating Disorder Examination Questionnaire	4th edition, 36 item measure with four subscales; restraint, eating concern, weight concern, and shape concern.	Fairburn and Cooper, 1994, derived from the eating disorder examination interview. Cronbach's Alpha for the four subscales = ranged from 0.78-0.93 Pearson co-efficient correlations for the reliability ranged from 0.81-0.94 across the subscales.
Relationship Assessment Scale	7 item measure scored on a 5-point likert scale, where the total score ranges from 7 to 35, where higher scores indicate greater relationship satisfaction.	Hendrick, 1988 Co-efficient alpha for the RAS ranges between 0.86 and 0.91.
Revised Restraint Scale	10 items, scored on a likert scale that tap diet, weight history, and concern with food and eating. It consists of two subscales: Weight fluctuation and Concern for Dieting.	Herman and Polivy, 1980 High test-retest reliability and internal consistency, .95 and .82, respectively.

questionnaire asked participants to specifically rate the mate they chose on the same list of mate characteristics, and then provide a rating of how happy they would be in a long term relationship with their choice. Participants were given 20 minutes in total to view the mates, make their choice, complete the questionnaires, and write one page justifying their choice.

Demographic Questionnaire

The demographic questionnaire was designed for the current study. Participants were asked to respond to questions about their age, education, ethnic background, religious affiliation, marital status, sexual orientation, and allergies or dietary restrictions. The demographic questionnaire is presented in Appendix E.

Eating Disorder Examination Questionnaire

The Fourth edition of the Eating Disorder Examination Questionnaire (EDEQ; (Fairburn & Beglin, 1994; Fairburn & Cooper, 1993) was utilized due to its diagnostic capabilities for assessing whether participants currently suffer from eating pathology. This 36-item self-report measure generates four subscale scores (Restraint, Eating Concern, Shape Concern, and Weight Concern), as well as an overall score comprised of the four subscales. The four subscales provide information about the severity of aspects of the psychopathology of eating disorders such as individuals' body image concerns and eating pathology. The Restraint subscale asks questions such as, "Have you gone for long periods of time (8 hours or more) without eating anything in order to influence your shape or weight?" The Eating Concern subscale asks questions such as "Have you eaten in secret?" The Shape Concern subscale poses questions such as "Has thinking about food or its calorie content made it much more difficult to concentrate on things you are

interested in; for example, read, watch TV, or follow a conversation?" Finally, the Weight Concern subscale addresses issues such as "How much would it upset you if you had to weigh yourself once a week for the next four weeks?" Items are rated on a 7-point Likert scale (0-6) and scores between four and six inclusively indicate clinical severity. Cronbach's alpha co-efficients for the four subscales ranged from 0.78-0.93, and Pearson correlation coefficients for the reliability ranged from 0.81-0.94 across the subscales (Luce & Crowther, 1999). The EDEQ can be found in Appendix F.

Relationship Assessment Scale

The Relationship Assessment Scale (RAS) was developed by Hendrick (1988) to measure one's subjective evaluation of a close relationship. This measure was utilized because it is not limited to marriage relationships and has shown strong predictive validity with dating couples (Vaughn & Matyastik Baier, 1999). The RAS consists of 7 items, scored on a 5-point Likert scale, and either the total or the average score can be used for interpretation. For the purposes of this study, the total score will be used. It ranges from 7 to 35, with higher scores indicating greater relationship satisfaction. An example of a question is, "In general, how satisfied are you with your relationship?" Two different studies have revealed that the co-efficient alpha for the RAS ranges between 0.86 (Hendrick, 1988), and 0.91 (Vaughn & Matyastik Baier, 1999). The RAS can be found in Appendix G. Because the same package was handed out whether the individual was single or committed, a disclaimer was added at the top informing participants that if they were not currently involved in a relationship, they were to skip this questionnaire and go onto the next one. As well, an eighth question was added to the

bottom of the questionnaire asking how long the participant had been involved in the current relationship.

Restraint Scale-Revised

The Restraint Scale (RS) was created to assess dietary restraint, and was developed by Herman and Mack (1975). The current version, the Revised Restraint Scale (RRS) (Appendix H), was used as a psychometric measure for assessing restrained eating (Herman & Polivy, 1980). It consists of 12 items, scored on a likert scale that taps diet, weight history, and concerns with food and eating (Heatherton, Herman, Polivy, King, & McGree, 1988). The RRS has two subscales: Weight fluctuation and Concern for Dieting. Sample items of the Concern for dieting subscale include "How often are you dieting" and "Do you have feelings of guilty after overeating." A sample item from the Weight Fluctuation subscale is "In a typical week, how much does your weight fluctuate (in pounds)?" Similar to past studies, individuals who scored under 15 on the questionnaire were classified as "unrestrained" eaters and individuals who scored 15 or above were classified as "restrained" eaters. The Revised Restraint Scale has been demonstrated to have high test-retest reliability and internal consistency, .95 and .82, respectively (Allison, Kalinsky, & Gorman, 1992).

Procedure

Upon arriving at the lab, participants were told that the research was being conducted to determine how females choose mates, and what qualities they look for in a mate. In order to ensure anonymity, participants were asked not to write their name on any of the materials provided. Because participants were expected to eat M&Ms, they were booked for the study between the hours of 12:00 and 5:00 pm, Monday to Friday.

For the mate selection portion of the study, participants were brought into the lab and told to have a seat at the table. On the table were some pens, the consent form, a small bell, and the participant pool bonus mark recording sheet. Participants were asked to read the consent form and complete the sheet for the participant pool while the experimenter went to get the materials for the study. The experimenter then re-entered the room carrying a bowl, a bag of opened pre-counted and pre-weighed M&Ms, and a pair of scissors. The scissors were included to give the impression that the bag of M&Ms had just been opened. Using the same photographs, participants were randomly assigned to be exposed to either the evolutionarily desirable or evolutionarily undesirable mate descriptions. Participants were then handed either the evolutionarily desirable or undesirable mate descriptions with pictures and corresponding questionnaires. In the desirable mate condition, these pictures and descriptions depicted desirable mates. In the undesirable mate condition, the same two pictures and two different descriptions depicted undesirable mates. Participants were instructed to read each mate description carefully to decide whom they would choose for a long-term mate. Along with filling out the mate questionnaire, they were asked to write approximately one page at the end of the questionnaire, explaining their choice. The experimenter then went over the questionnaire with the participants to ensure that they understood the task of both choosing a mate and explaining their choice. At that point, the experimenter casually grabbed the open bag of 201 M&Ms and poured them into the bowl telling the participant that "the M&Ms' were going to be used in an experiment on taste preference but it was cancelled yesterday, so now we have a lot of them and you are welcome to help yourself." The experimenter casually took one M&M still left in the bag, and ate it while

informing the participant that they had to take the full 20 minutes to complete their task. M&Ms served as the dependent variable and have been used in previous studies. A study by Copeland, Woods, and Hursey (1995) examined the relationship between social interaction variables and eating disinhibition among restrained eaters utilizing M&M consumption as the dependent variable.

Exactly twenty minutes later, the experimenter re-entered the room with the remainder of the questionnaires. Participants were then asked to complete the demographic information sheet as well as the EDEQ, RAS, and the Restraint Scale. These three questionnaires were presented in a counterbalanced order over the course of the study. The experimenter then gathered up the mate descriptions, the explanation sheet, the questionnaires, and the M&Ms telling the participant, "I'm just going to get everything out of your way." The participant was then told to ring the bell when they were finished filling out the questionnaires. After the participants completed their second set of questionnaires, they were debriefed and informed of the true nature of the study (See Appendix I). Participants were then asked if they would mind having their weight and height measured and were reminded that everything was confidential. Only three participants declined to have their height and weight taken. Two of the participants had answered the questions on the RRS concerning their height and weight, and their answers were utilized to calculate their Body Mass Index (BMI). One individual of average height and weight also declined to be weighed and measured, and had also not included that information on the RRS. A mean BMI was assigned based upon the average BMI of all participants. After the study was complete, participants were asked if they had any questions, and told when the results of the study would be made available.

Stability of the Revised Restraint Scale – Pre Study

The Revised Restraint Scale has been extensively used as a measure of participant's restraint status (Drewnowski, Riskey, & Desor, 1982; Lowe, 1984; Ogden, 1993). Occurring primarily in studies where the nature of the study is concealed, the restraint scale is typically administered after the experimental manipulation. Restraint needs to be measured after the measurement of the dependent variable in order to maintain the internal validity of the study. Specifically, most studies measuring food intake require that the participant remains unaware that their food intake is measured. It is clear both in past research and on a common sense level that when participants are aware that their food intake is being monitored, they modify it accordingly. This is not a novel effect. It exists across studies where participants who were aware they were being observed behaved differently then those who were not aware of being observed.

Because the dependent variable is usually measured after exposure to the independent variables, a concern exists that measuring the dependent variable (which in this study is the number of M&Ms consumed) prior to the participant's restraint status will significantly alter participants' self-report scores on the RRS.

In order to test this effect, a pre-study was undertaken where twenty participants received the RRS before being exposed to the dependent variable. Those participants' scores on the revised restraint scale were compared to twenty participants who received the RRS after the dependent variable. Results revealed no significant differences between the participant's scores on the RRS according to whether they received it before ($M = 11.0$, $SD = 5.56$) or after ($M = 12.42$, $SD = 5.95$) F, $(1, 31) = .412$, $p = .526$ the

experimental manipulation. Thus, results revealed that the order in which the restraint scale is given to participants has no effect on their scores of the restraint scale.

Planned Analyses

This was a 2 X 2 X 2 experimental design with restraint status as a two level factor (restrained, unrestrained); relationship commitment as a two level factor (committed, single); and desirability of mate as a two level factor (evolutionarily desirable, evolutionarily undesirable). Participant's rating of the mates was also assessed with independent *t*-tests to serve as a replication of previous studies that have demonstrated that females rate evolutionarily desirable males as desirable compared to undesirable mates. Mean ratings of the evolutionarily desirable mates and evolutionary undesirable mates were compared based on the partner questionnaire.

Chapter III

Results

Approach to Data Analysis

All analyses were performed using Statistics for Psychology Statistical Software (SPSS) for Windows, Version 11.0. Reliability analyses were conducted on the Revised Restraint Scale (RRS), the Relationship Assessment Scale (RAS), and the Eating Disorder Examination Questionnaire (EDEQ). Descriptive analyses were performed on all variables included in the study. Following descriptive analyses, an analysis of variance (ANOVA) was performed to investigate whether the amount of M&Ms consumed was influenced by the independent variables of eating pathology, mate desirability and relationship status.

Exclusion Criteria

Prior to the study, participants filled out questions on the participant pool to allow the researcher to exclude those individuals who had a past or present eating disorder, and who did not feel satisfied in their long-term relationship. Of those participants involved in a relationship longer than one year in length, 94% rated their relationship as above average or satisfying, while 6% did not. Those four participants who rated their relationship below average where excluded from the study, as a requirement of the committed participants was to be in a satisfying, committed relationship. As well, two participants were excluded from the study because they endorsed purging behaviours on the EDEQ, which qualified as diagnostic criteria for an eating disorder. Included in the demographic questionnaire was a question assessing participants' allergies and dietary

restrictions. One participant was excluded from the study, because she was lactose intolerant and could not eat any derivates of dairy products, including M&Ms.

Descriptive Information and Scoring of the Measures

The dependent variable, number of consumed M&Ms was quantified utilizing grams consumed by each participant. Prior to conducting further analyses, the data were explored and normality of M&M gram consumption was assessed using a Q-Q plot, a histogram of participant's scores, and the Kolmogorov-Smirnov (*KS*) statistic (Field, 2000). A visual inspection of the histogram revealed that participants' scores were positively skewed. Similarly, the Kolmogorov-Smirnov statistic revealed that there was a significant deviation from normality, KS (1, 130) = .095, p = .006. A square root transformation is among the recommended suggestions for data that are moderately positively skewed (Tabachnick & Fidell, 2001). The transformation was performed and the data more closely approximated a normal distribution, KS (1, 130) = .060, p = .200. The mean M&M gram consumption score for participants was 27.34 (SD = 17.42). Totals ranged from 0 to 76 M&M grams consumed.

The mean score on the Revised Restraint Scale was 11.39 (SD = 5.43). Scores on this measure ranged from 1 to 25. Seventy-one participants (54.62 %) were classified as unrestrained eaters and 59 (45.38 %) were classified as restrained eaters.

The Relationship Assessment Scale (RAS) was scored by calculating the sum of the seven questions, with higher scores indicating greater satisfaction. The maximum score was 35 and a score of 21 was considered the midpoint as it was the sum participants would receive if they rated their relationship as average for all the responses. Participants scoring below the midpoint rated their relationship below average and were excluded

from the study. The mean relationship assessment score was 30.48 (SD = 3.77) and participants scores ranged from 19 to 35. Sixty-two participants were classified as committed in a happy relationship of a minimum of one year in length, and sixty-eight participants were in the non-committed status, meaning they were single, or involved in a relationship less than one year in length.

The Eating Disorder Examination Questionnaire (EDEQ) was used as a diagnostic measure to confirm that no participants qualified for a diagnosis of an eating disorder. Participants had to indicate on a seven point likert scale the number of days they engaged in the behaviour in the last 28 days. An endorsement of 0 meant no days, and an endorsement of 6 meant everyday. Both the overall score of the EDEQ and the four subscales of the EDEQ, restraint, eating concern, shape concern, and weight concern were calculated. A comparison with community norms provided by the author of the EDEQ revealed no significant differences. The EDEQ also contains diagnostic questions which when endorsed reveal the extent to which participants are actively engaging in eating disorder symptomatology. No scoring procedure was needed as participants who endorsed yes to questions about purging behavior such as vomiting, laxative use, extreme exercise, and diuretic use were automatically excluded from the study. This is because they were exhibiting active symptoms at the time of the study, and might potentially qualify for a diagnosis of an active eating disorder. Similarly, participants who endorsed frequently eating unusually large amounts of food in a discrete period of time, with the feelings of losing control were also excluded from the study as they were exhibiting symptoms that could be reflective of active Binge Eating Disorder.

The ranges, means, and standard deviations for the participants' descriptive information and all measures are displayed in Table 4.

Reliability Analyses

Prior to further analyses, the internal reliability Cronbach alpha coefficients for all the measures were calculated. These are included in Table 4. The overall reliability analysis revealed coefficients ranging from .77 to .92. It has been recommended that reliability for measures used for research purposes range from .70 and up (Kaplan & Saccuzzo, 1997). Thus, all measures were in an acceptable range.

Mate Desirability Analysis - Hypothesis One

An independent t-test was conducted to verify this sexual selection theory in evolutionary theory. In particular, when physical attractiveness is controlled for, women will prefer men with evolutionarily desirable qualities over men who do not possess those traits. This a replication of previous studies that have both demonstrated and confirmed this finding. In short, it was noted that these females did find the evolutionarily desirable males desirable, compared to the evolutionary undesirable males. A significant difference was found, where participants exposed to the evolutionarily desirable mates rated them as desirable ($M = 4.29$, $SD = .62$) and indicated that they would be happy with their mate choice, and those participants exposed to the evolutionarily undesirable mates did not rate them as desirable ($M = 1.62$, $SD = .63$), $t\ (130) = 6.706$, $p < .001$. The range in ratings of desirability of the evolutionarily desirable mates was 3 (2-5), with only one individual rating the mate below the midpoint of the scale at a score of two, and

Table 4

Descriptive Data for Participants and Study Measures (N = 129)

Variable	Range	Mean	Standard Deviation	Cronbach's Alpha
Age	17-25	21.11	1.26	
Program Year	1-6			
RRS	1-25	11.39	5.43	.79
RAS	19-35	30.48	3.77	.82
EDEQ	0-87	27.14	19.57	.92

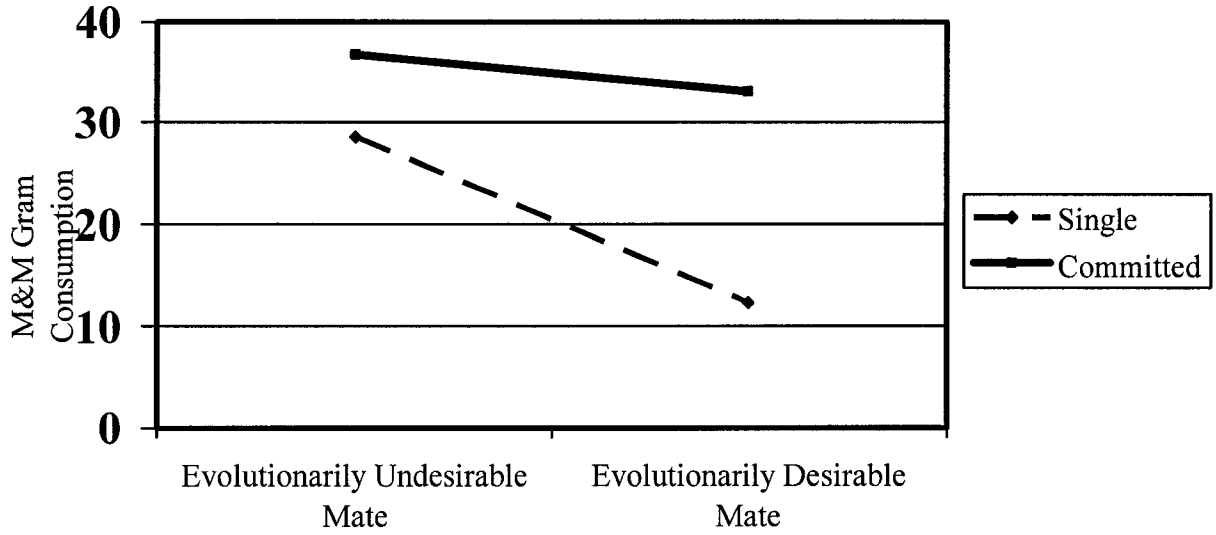
Note:
RRS: Revised Restraint Scale
RAS: Relationship Assessment Scale
EDEQ: Eating Disorder Examination Questionnaire

similarly, the range for ratings of the evolutionarily undesirable mates was also 3 (1-4), with only one individual rating the mate above the midpoint of the scale at a score of four.

Primary Analyses

A 2 X 2 X 2 between-groups factorial analysis of variance (ANOVA) was used to investigate the effects of mate exposure (evolutionarily desirable mate vs. evolutionarily undesirable mate), relationship status (committed vs. non-committed) and restraint status (restrained, unrestrained), on the participants' eating behaviour. The analysis revealed a main effect of mate description such that individuals exposed to the evolutionarily desirable mates ate less regardless of relationship or restraint status, $F(1, 122) = 16.27, p < .001$. A main effect of relationship status was also revealed, such that single participants ate less overall then committed participants, $F(1, 122) = 32.47, p < .001$. These results were qualified by a significant interaction between relationship status and mate description, $F(1, 122) = 5.38, p < .05$ (see Figure 1 for a visual illustration of the results). When exposed to the evolutionarily desirable mates, the single participants ate significantly fewer M&Ms ($M = 12.29$, $SD = 11.68$) than the committed participants ($M = 33.06$, $SD = 17.28$) (Figure 1). Simple effects tests showed that committed participants did not differ in M&M consumption across the levels of the mate description, $t(60) = .850, p = .399$. However, single participants ate significantly less M&Ms when exposed to the evolutionarily desirable mates ($M = 12.29$, $SD = 11.68$) than when exposed to the evolutionary undesirable mates ($M = 28.53$, $SD = 12.39$), $t(66) = 5.56, p = .001$. Additional simple effects tests revealed significant differences between single and committed participants in M&M consumption for both levels of the mate

Figure 1. Two Way Interaction between Relationship Status and Mate Status



descriptions. When exposed to the evolutionarily desirable mates, single participants (M = 12.29, SD = 11.68) ate less and committed individuals (M = 33.06, SD = 17.28) ate more, t (63) = 5.72, p = .001. When exposed to the evolutionarily undesirable mates, single participants (M = 28.53, SD = 12.39) also ate less than the committed individuals (M = 36.81, SD = 17.40), t (63) = 2.22, p = .030. Further, a main effect of restraint status was evident, whereby restrained eaters ate more overall compared to unrestrained eaters, F (1, 122) = 7.26, p < .05.[1]

[1] All raw, untransformed data have been reported in the body of the text to ensure conceptual clarity. The statistics resulting from the square root transformations are reported as follows: Unrestrained, Single Desirable M = 2.96 (SD = 1.01); Unrestrained, Single Undesirable M = 4.96 (SD = 1.25); Unrestrained, Committed Desirable M = 5.41 (SD = 1.68); Unrestrained, Committed Undesirable M = 5.34 (SD = 1.45); Restrained, Single Desirable M = 3.45 (SD = 1.98); Restrained, Single Undesirable M = 5.53 (SD = 1.03); Restrained, Committed Desirable M = 5.70 (SD = 1.37); Restrained, Committed Undesirable M = 6.58 (SD = 1.13).

Chapter IV

Discussion

The first hypothesis of this study stated that participant's rating of the evolutionary desirable mates would be significantly higher, and thus more favorable, than participants' rating of the evolutionary undesirable mates. This hypothesis was supported and replicated previous studies showing that women prefer males who possess evolutionarily desirable characteristics (Barash & Lipton, 2002; Buss, 1999; Buss et al., 1990; Davis, 1990). These results directly support the sexual selection theory of evolution suggesting that females favour males who display the characteristics necessary to provide for their well-being and that of their offspring.

The second hypothesis of the current study was that single, restrained women, when exposed to a desirable mate, would eat the least amount of M&Ms. This predicted three-way interaction was not found. Instead, the analyses revealed a significant interaction between relationship status and mate description such that single women ate the least amount of M&Ms when exposed to the evolutionarily desirable mate descriptions. This finding is important for many reasons. Past research has examined male's perceptions of women based on their eating behaviour (Mooney et al., 1994), as well as women's eating behaviour while in the presence of others (De Luca & Spigelman, 1979; Herman et al., 1979), including physically desirable men (Copeland et al., 1995; Pliner & Chaiken, 1990). Pliner and Chaiken (1990) found that participants ate less in the presence of an attractive male or female confederate, and found an overall effect where participants ate less in the presence of a partner of the opposite sex. Similarly, Copeland, Woods, and Hursey (1995) found that average restrained women's eating was

significantly depressed following interaction with a partner whom subjects considered physically attractive. In both cases, the dining partner's physical attractiveness was manipulated and shown to have an effect such that physically attractive partners induced a reduction in eating. However, the effect of evolutionarily desirable characteristics on women's eating while controlling for physical attractiveness had never been investigated. This study is the first study to provide information regarding women's eating behaviour when exposed to evolutionarily desirable potential mates. In short, it shows that the evolutionary qualities of a male do have an impact on how much women will eat. It adds support to the many examples in today's society of women's concerns about appearing attractive to potential mates. Specifically, knowledge of this behaviour in daily functions is evident in fashion magazine articles that offer advice on how to eat daintily while out on a date, and in television and movies which depict how to appear feminine to men.

Further, the finding that single women eat less M&Ms overall than committed women clearly supports the idea that women who have not yet found a partner pursue thinness to a greater extent than women who have found a mate. The fact that this is magnified by exposure to a desirable mate confirms that eating less and pursuing thinness is an evolutionary strategy for these women. In other words, some women who are searching for a potential partner pursue thinness, because they see it as an advantage. This is confirmed by the finding that they eat even less when the mate is evolutionarily desirable. Women apparently feel that their chances of getting that desirable mate are increased by eating less and being thinner. It is important to note that this study provides direct evidence that women restrict their eating while they have the cognitive

representation of a potential mate. Thus, the study does not allow us to measure whether single women eat less chronically, at all times.

In terms of ultimate causation, these results are compatible with and provide complementary support for one facet of Abed's Sexual Competition Hypothesis for Eating Disorders. Abed theorized that females set their body template at an abnormally low weight in order to compete with other females for the mating rights with males (1998). Further, Abed felt that this phenomenon would characteristically be seen in females who are looking for males with evolutionarily desirable traits (1998). In short, this study has provided evidence for Abed's theory on a global level, in demonstrating that females eat less when exposed to evolutionarily desirable mates.

Further, this current study's finding that single women eat less while in the presence of evolutionarily desirable mates is compatible with the proximal theories currently available as explanations for eating disorders. In terms of biological theories for eating disorders, Gatward (2001) has argued that ancestral women who could demonstrate anorexic qualities such as restrictive eating behaviour and thinness as a survival mechanism were widely sought after as mates. This is due to uncertain environmental conditions that plagued the human race making food resources scarce, and the ability to engage in restrictive eating valued. The finding that single women ate less in front of potential evolutionarily desirable mates is directly compatible with this biological theory for eating disorders. In short, it could be taken as direct evidence that females are still engaging is ancestral mating techniques to maximize their potential of attracting a mate.

Present research on societal influence and social theories for the development and maintenance of eating disorders also aligns with the current findings. Of particular relevance is the research where adolescent girls who viewed themselves in the eyes of their peers believed that if they were thinner and more attractive, they would be popular with opposite-sex peers (Lieberman et al., 2001). Our research with single university women who have clearly been shown to restrict their eating in the presence of a desirable mate draws attention to the pervasiveness of the societal influences. Also, past research revealed that subjects assumed that an attractive individual was more likely to find an acceptable partner than those individuals who were perceived as less attractive (Dion et al., 1972). Much research has shown that women perceive men as desiring thinness, and that women themselves want to be thinner than what men want them to be (Fallon & Rozin, 1985; Rozin & Fallon, 1988). This societal pressure to appear attractive, and thus thin to potential partners, could be directly observed in the results where all females ate less, and single females ate the least when in the presence of the desirable mate. Perhaps these females equated eating less with the ability to obtain a suitable, evolutionarily desirable mate. In sum, the desire to alter one's appearance to what is now considered socially "attractive" interacts with and parallels the evolutionary theory of mate selection.

It is important to note that if social influence was deemed to be the main reason for the amount of M&M's consumed, all women would have had to demonstrate the restrictive behaviour in all conditions. In short, it is entirely possible that single women would be eating less than committed women as they may be more susceptible to the social influence. However, it is clear that evolution plays the primary role, because it was the direct manipulation of the evolutionary characteristics that influenced the amount of

M&Ms consumed by single women. Single women ate less when exposed to the evolutionarily desirable mates. This means that something within the description of the evolutionary quality of the desirable mates influenced the women's eating behaviour, which directly supports the evolutionary theory.

Thus, in terms of the development and maintenance of eating disorders, the current research serves to support proximal causes such as social and biological theories for eating disorders as well as provide direct evidence for the ultimate cause; evolution.

In terms of restraint status, both the predicted main effect of restraint status and the three-way interaction between relationship status, mate description, and restraint status was not found, due to restrained eaters consuming more than unrestrained eaters. It was predicted that restrained eaters would eat less M&Ms than unrestrained eaters in both hypotheses, however the restrained eaters ate significantly more grams of M&Ms than the unrestrained eaters, regardless of mate exposure. Thus, according to restraint theory, something about the exposure to the mate descriptions, desirable or undesirable, caused restrained eaters to break their cognitive restraint.

One reason could be that the exposure to males who are specifically looking for mates evoked some type of negative emotion severe enough to cause dieting females to break their diet. It is well known in the literature and recognized that many males prefer females who are stereotypically feminine, of which thinness is a characteristic (Chaiken & Pliner, 1987). It is conceivable that simple exposure to males who will be judging the female who responds to the ad creates a sense of discomfort in dieters about their self-image, causing them to break their diet. In addition, restrained eaters have been shown to endorse experiencing lower levels of self esteem then unrestrained eaters; self-esteem is

largely unrelated to body size, but highly related to restraint status (Drewnowski et al., 1982; Heatherton et al., 1988; Pliner, 1990). Taken together, the low self esteem and low self image with the knowledge from past research has revealed that threats to an individual's ego can directly lead to a weakening of cognitive restraint, and therefore, to disinhibition (Kahan, Polivy, & Herman, 2003). It could be that when dieters were exposed to the undesirable mates, they became discouraged and thought, "are these males the only ones that I have left to choose from?" and when exposed to the desirable males thought, "I will never end up with a mate of this caliber." These thoughts may cause enough distress to lead to weakened cognitive restraint and disinhibition.

Recent research has revealed another possibility for why restrained eaters consumed more M&Ms then unrestrained eaters (Stirling & Yeomans, 2004). This study explored the effect of availability of a forbidden food on subsequent eating behavior in restrained and unrestrained women. They found that although subjects were instructed not to eat the food provided for the exposure period, women in the restrained group consumed a small quantity of the chocolate, whereas unrestrained women consumed none. In terms of the current research, perhaps these restrained women also viewed chocolate as a forbidden food, and upon exposure to the food, felt compelled to consume some.

As well, the fourth hypothesis that single females who are still potentially looking for a mate would eat fewer M&Ms compared to the committed individuals in the study, regardless of mate status was supported. Thus, all single women ate less than the committed women, but even less, when exposed to the desirable mates, findings that were revealed through the post hoc simple effects tests. These findings are qualified by the

interaction, and reveal a key difference between females who are committed and happy in a relationship with their mate, and females who are still pursuing relationships. The fact that single females are engaging in significant food reduction when compared to committed individuals while in the presence of a potential mate, regardless of that mate's status, lends support to Abed's theory that women's food intake, and thus body template, is moderated in some fashion by the presence of an available mate. It is interesting to note that committed females ate more than single females regardless of the mate that they were exposed to. This could be because committed females are less concerned about a bowl of snack food, and cognitively viewed the additional food as negligible in the larger picture of their lives. On the contrary, single individuals who may be devoting more time and energy to pursuing or maintaining a thin shape, may view a bowl of snack food as a direct impediment to their goal of finding an evolutionarily desirable mate.

Limitations of the Current Study

A major potential limitation of the current study concerns the characteristics of the sample. The sample was composed primarily of university students who identified themselves as Canadian or Caucasian. As well, the participants were young, with a mean age of 21 years, with little variation. By only measuring participants who are university students, we were not able to compare females of all ages, to determine if high school females or older women engage in these same behaviours. This limits the generalizability of these findings.

Another limitation of the study could be the cross-sectional nature of the study. It provided a one-time measure of participants' eating. A measure of individuals' eating behaviour for longer periods, in a variety of different situations may have provided more

extensive data. In sum, having data on women's eating behaviour over a long period of time would allow stronger confirmation of the current findings.

In addition, utilizing a theoretical cut-off to categorize restraint status may have decreased the likelihood of finding significant results. The most common method for tabulating restraint is to dichotomize the variable (Herman & Polivy, 1980), however other studies have examined restraint using a three level split (Copeland et al., 1995; Stein, 1988). The fact that the findings were significant considering the dichotomization suggests that they are robust. There is a possibility that other significant effects may have been found if participants were classified on three levels of restraint, however the size of the sample did not allow for this type of comparison.

Finally, by using mate packages instead of real life mates for exposure, it is possible that the ability to find significant results was decreased. However, the fact that three main effects and one interaction was significant in spite of the paper-based mates, again suggests that results are robust. It is possible that employing male confederates to pose as potential mates would induce greater overall effects in the participants' reactions to the mates.

Suggestions for Future Research

A suggestion for future research is to replicate the study, while including both high school age females, and females in the age range of 30-50 years. This would provide key information about whether the current results are also occurring with both younger and older females. There is an expectation that high school females would also be engaging in restrictive eating behaviour but perhaps less strongly given that they are just starting to explore potential mates. As women get older, dating becomes more a

means of mate sorting and selection whether the motive is conscious or not. This may be more intense at the university level when females are typically looking for lifetime partners (Rice, 1995). In terms of older females, it is unknown whether they would restrict their eating in the presence of evolutionarily desirable mates, given that older females are likely to be more secure in themselves and more independent (Rice, 1995). A longitudinal study examining women first in college, then at ages 27, 43, and 52 revealed women reporting decreased dependence and increased decisiveness and confidence (Rice, 1995). Based on those findings, it would be interesting to replicate the study in other age groups to evaluate whether evolutionary theory is still significant for these populations. To date, no studies have examined any age population and their eating habits relative to their desire to find a mate.

Conclusions

The current study was based on Abed's Sexual Competition Theory for Eating Disorders (1998). This study was designed to critically examine whether females modify their eating when exposed to evolutionarily desirable males. The results provide clear evidence that single females restrict their eating in the presence of a desirable mate.

More specifically, the study investigated how females' eating behaviour is affected by exposure to evolutionarily desirable and undesirable mates. Based on males' preferences for younger, attractive females, Abed hypothesized that vulnerable females would engage in eating disordered behaviour to ensure that they themselves will possess those desired characteristics (1998). As well, he felt that the current social environment raises the stakes for females to be thin. Environmental factors include but are not limited to, increased divorce rates, increased female economic and social independence, and

increased ability for females to control or modify their body shapes. As a result of these external pressures, Abed postulated that females set their body shape at a lower template in order to more effectively compete with other females (1998). The desired result for females would be to look the thinnest, and thus, most attractive.

The findings of this study have important implications for eating disorder prevention programs for females. By targeting females who are entering high school, supplementary programs could be developed and added to eating disorder psychoeducational training to address the strong negative consequences of comparisons with other females. Finally, based on these results, the goal of future research should be to further assess females' eating behaviour within the context of mate selection. More specifically, research conducted by running females in groups would address the social aspect of Abed's theory, which claims that women make direct comparisons with other women. By adding the ability to socially compare with other females in the experimental procedure, while exposing them to the evolutionarily desirable mates and measuring their food intake, it will be possible to see if social comparison further moderates the relationship between eating behaviour and mate selection.

Chapter V

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Chapter VI

Appendix A

UNIVERSITY OF WINDSOR

CONSENT FORM

CONSENT TO PARTICIPATE IN RESEARCH

Mate Selection and Evolution

You are asked to participate in a research study conducted by Sara Robillard (Master's Thesis) and Dr. Josee Jarry, from the Psychology Department at the University of Windsor. The results will be contributed to a Master's Thesis that is being sponsored by the National Science and Engineering Research Council. If you have any questions or concerns about the research, please feel to contact Dr. Josee Jarry (253-3000, ext 2237) in the Department of Psychology.

PURPOSE OF THE STUDY

The purpose of this study is to assess partner qualities and the reasoning behind why people choose certain partners over others.

PROCEDURES

If you volunteer to participate in this study, we would ask you to do the following things. The researcher will require you to spend twenty minutes: reading the two candidates descriptions, filling out a questionnaire concerning your choice of partner, and writing down your justification for your partner choice that is approximately one page in length. Afterwards, you will be asked to fill out some additional questionnaires which should take approximately 15 to 20 minutes.

The researcher will ask that you set aside 30 to 45 minutes for the total length of participation time. The research will take place in room 287 of Chrysler Hall South. If so desired, participants will be able to access the research findings in the Psychology Department and will be made available in June of 2004.

POTENTIAL RISKS AND DISCOMFORTS

You will be asked a variety of questions which may be personal in nature. A risk associated with this study is the possibility that thinking about these personal issues may raise some psychological and emotional concerns for you. If during or after the study, you have concerns you wish to discuss please contact the Psychological Services Centre on Sunset at 253-3000 ext. 7012.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

You will not benefit from the current study other than the opportunity to learn about and contribute to psychological research. The benefit to society is increasing scientific knowledge in the area of evolution.

PAYMENT FOR PARTICIPATION

Finally, to thank you for your participation in this study, you may be eligible to receive two bonus points toward an undergraduate psychology course of your choice.

CONFIDENTIALITY

Any information you provide will be used for research purposes only, which may eventually include publication in a research article, or use of your anonymous data in subsequent studies. Your name will not appear on any of the questionnaires you fill out or in any future publications, and will only be disclosed with your permission. My signature on this sheet indicates that I agree to participate in this study assessing mate qualities. Signing this form indicates that I understand the following:

1. I am a volunteer and can withdraw from the study at any time.
2. The data I provide is confidential, and will be securely stored in the Department of Psychology at Windsor University for seven years.

PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may exercise the option of removing your data from the study. You may also refuse to answer any questions that you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so. If at any time during the study, you have questions, please feel free to ask the examiner. Also, please do not discuss this study with anyone, as they may also be participating in the study. If other participants have inside knowledge of this study, the integrity of the study may be compromised.

RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. This study has been reviewed and received ethics clearance through the University of Windsor Research Ethics Board. If you have questions regarding your rights as a research subject, contact:

Research Ethics Co-ordinator
University of Windsor
Windsor, Ontario
N9B 3P4

Telephone: 519-253-3000 ext. # 3916
E-Mail: ethics@uwindsor.ca

SIGNATURE OF RESEARCH SUBJECT/LEGAL REPRESENTATIVE

I understand the information provided for the study "Mate Selection and Evolution" as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form. I have received explanations about the nature of the study, its purpose, and procedures.

Name of Subject

Signature of Subject Date

SIGNATURE OF INVESTIGATOR

In my judgment, the subject is voluntarily and knowingly giving informed consent to participate in this research study.

Signature of Investigator

Appendix B

UNIVERSITY OF WINDSOR

CONSENT FORM – POST STUDY

CONSENT STATEMENT FOR WEIGHT AND HEIGHT MEASUREMENT POST STUDY

You have just participated in a research study conducted by Sara Robillard and Dr. Josee Jarry at the University of Windsor entitled: The Effect of Exposure to a Desirable Mate on the Eating Behaviour of Restrained and Unrestrained Eaters: An Evolutionary Perspective.

As a final part of the larger study you have just completed, you have been asked to allow the investigator to obtain a measure of your height and weight, so your body mass index (BMI) can be calculated.

The information you provide the investigator will remain confidential and will be disclosed only with your permission. Any information you provide will be used for research purposes only, which may eventually include publication in a research article.

Taking part in this final portion of this study is completely voluntary. If you do not wish to be weighed or have your height measured, you are free to refuse without any penalty or loss of bonus points.

If you are willing to participate in this study and understand all that will be asked of you in participating, please sign your name following this consent statement.

I hereby acknowledge that, after reading this statement, I am willing to allow the investigator to measure my height and weight. I understand that all information I provide will be used for research purposes only and that anonymity is assured. I also realize I am free to withdraw from the study at any time without penalty.

Signature of Participant Date

Signature of Investigator Date

Appendix C

Dating Advertisement

(July, 2003, Toronto Star) - This NEW Toronto Dating Agency has 2 different communities: casual dating, and long term romance - 2 options to meet your needs.

The LONG TERM ROMANCE brings people together who share the desire to meet that special person that they can share the rest of their lives with.

Because this dating agency is looking to make life long connections, individuals are required to write up their profiles entirely on their own. This agency does not have categories that you HAVE to fit into, or information that you have to provide. Remember, this agency is looking to connect serious individuals, interested in long term relationships, so the more well-rounded description you provide, the easier it will be for us to find that special person. The only requirement is that you provide a picture with your profile that we will take right at the agency. Remember, first impressions are everything.

Security is a priority, and all applicants who want to be a member of this exciting new agency **must** agree to participate with the procedures, and will be **thoroughly screened** for honesty on the application. Unlike other agencies, you will have no worries that the person advertising their attributes is telling anything but the truth!

This is a new front line style of dating connections that is guaranteed to offer lots of new and interesting personals not found on the other dating sites. This is the most popular "newest" dating site on the Web. To become a member of either site, the one time cost is $200 Canadian.

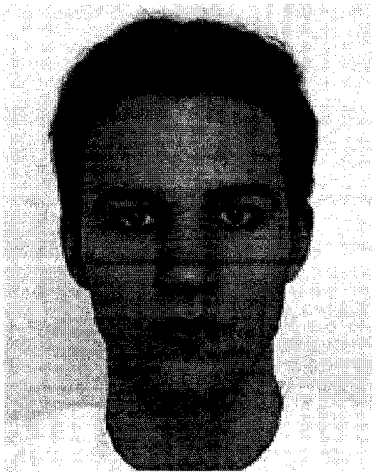
The following are 2 descriptions of 2 different males who hope to be potential partners. They were provided by the company for research purposes. This task involves looking at 2 pictures and accompanying descriptions of the candidates and indicating which male you would prefer if you were choosing based on a long term relationship (either common law, or marriage). You have to choose one of them. Please answer all the questions as honestly as you can. Remember, all of your responses will be kept completely confidential. There is no way in which we can identify you with your responses and we have truly no interest in doing so.

You will be filling out 2 questionnaires based on your choice and then be asked to write down why you choose your mate, approximately a page in length. (Space will be provided for this). The first questionnaire will address how important these partner characteristics are to you and the second questionnaire will address the degree to which you feel that your 'partner choice' possesses those qualities. You will have exactly 20 minutes to read the descriptions, choose your mate, answer the questionnaires and write down why you have made your choice.

Appendix C

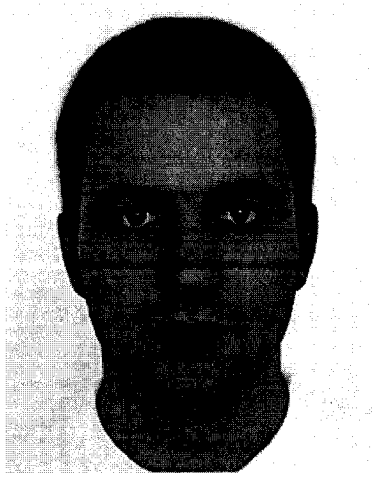
Mate Descriptions

Mate One



Alex

Mate Two



Glenn

General Information

Age	26 years old	**Age**	27 years old
Height	6'1''	**Height**	6'
Weight	205 pounds	**Weight**	195 pounds
Hair Colour	Light Brown	**Hair Colour**	Black
Eye Colour	Green	**Eye Colour**	Brown

Appendix C

Evolutionarily Manipulated Mate Descriptions to accompany Package A.

Desirable Mate Descriptions

1. Hi, my name is Alex. I grew up in Barrie, Ontario and I have two brothers and one sister. I just graduated from the University of Toronto, Pharmacy program and have recently moved back to Barrie where I have since opened up two pharmacies in the area. I work on average four days a week, spending two days at each pharmacy during the week. I enjoy spending time with my family and my sister's children. I have recently purchased my own home from an estate sale, and spend my free days exploring the acreage that came with it. I often get together with my friends on Sundays at home and we have BBQ's and play baseball. I enjoy all sorts of activities, and hold season tickets to both the Toronto Symphony Orchestra and the Toronto Maple Leafs. I like to cook and I enjoy rollerblading. My friends would say that I am an honest, hardworking, loyal, funny guy and that I enjoy life to the fullest. I am hoping to find someone special who shares my goals interests and will want to share their life with me.

2. Hi my name is Glenn. I was born and raised in St. Catherine's with my two sisters. I have been living in St. Catherine's for two years since graduating from the McMaster Medicine program. I am a general practitioner and I have co-ownership in a clinic that recently opened up in St. Catherine's. I am nearing completion of my specialization course in surgery and will have one additional year of internship before registering as a full surgeon. My hobbies include playing squash in the summers and skiing in Aspen in the winters where I own a condominium. Due to my part-ownership of the clinic I set my own hours and often work three or four days a week. I recently bought a small yacht and often hold evening parties while sailing around Lake Erie. Also, one morning a week, I spend time at a free clinic seeing children who can not afford any procedures that are not covered by the Ontario Health Plan. When asked, my friends would unanimously agree that I am a dependable, warm, and caring, honest individual who is not shy of commitment and looking for that 'special' one.

Appendix C

Evolutionarily Manipulated Mate Descriptions to accompany Package B.

Undesirable Mate Descriptions

1. Hi, my name is Alex. I grew up in Barrie, Ontario and I have two brothers and one sister. I am currently working at Pizza Pizza as a delivery guy and I will be up for promotion to pizza cook in six month's time. I generally work evenings and weekends but I do have the weekdays free to hang out. I enjoy shooting pool and have recently joined a league. I still live at home with my family, because the rent is cheap, it allows me to support my comic book collection, and I can borrow the car. Even though my sister's kids are hanging around my living arrangement is suitable because it will also allow me to pay for most of our dates. I often get together with my friends on my off time and we jam with our guitars. I hate to cook, but I get free pizza which we will be able to enjoy together. When asked, my friends would say that I enjoy a good time and live for the moment.

2. Hi my name is Glenn. I was born and raised in St. Catherine's with my two sisters. Currently, I divide my time between working at a retail discount store and writing lyrics for songs, which I hope to sell to a singer someday. I still live at home, (in the basement), which guarantees some privacy. I love computer games, and I am currently the champion of 'War of the World's,' an online computer game. I am also good at fixing cars, and I am currently fixing up an old '88 Chevy that I hope to get on the road someday soon. My friends say that although I am a little unpredictable at times, I usually follow through with things, and that I am lots of fun to hang out with. I am looking for that one person who also finds my unpredictable nature appealing and thinks that I could be the one.

Appendix D

Partner Questionnaire – Importance of Characteristics

This task involves identifying characteristics that you would view as important when choosing a long-term partner (common law or marriage). Please indicate to what degree you think each attribute would be important to you with '1' being 'not at all important' to '5' being 'extremely important'.

1	**2**	**3**	**4**	**5**
Not at all Important		Somewhat Important		Extremely Important

	Partner Characteristics	**Scale**
1.	How important is attractiveness?	1 2 3 4 5
2.	How important is age?	1 2 3 4 5
3.	How important is generosity?	1 2 3 4 5
4.	How important is intelligence?	1 2 3 4 5
5.	How important is physique (athletic prowess)?	1 2 3 4 5
6.	How important is status of employment (job or no job)?	1 2 3 4 5
7.	How important is profession or job choice?	1 2 3 4 5
8.	How important is perceived financial stability?	1 2 3 4 5
9.	How important is education?	1 2 3 4 5
10.	How important is honesty?	1 2 3 4 5
11.	How important is his ability to be emotionally supportive?	1 2 3 4 5
12.	How important is a desire for a long term commitment that will likely lead to marriage?	1 2 3 4 5
13.	How important is his ability to interact with children in a positive manner?	1 2 3 4 5
14.	How important is maturity?	1 2 3 4 5
15.	How important is loyalty?	1 2 3 4 5
16.	How important is resources?	1 2 3 4 5
17.	How important is his ability to be a good provider?	1 2 3 4 5
18.	How important is health or healthy behaviour?	1 2 3 4 5
19.	How important is social status?	1 2 3 4 5
20.	How important is ambitiousness and industriousness?	1 2 3 4 5

I would be happy to have a serious relationship that could lead to marriage with my partner choice, or if I am in a serious relationship would like these qualities in my partner.

1	**2**	**3**	**4**	**5**
Not at all accurate		It's fairly accurate		Extremely accurate

Appendix D

Partner Questionnaire

This task involves answering questions on a scale about your long-term partner (common law or marriage) choice. Please indicate to what degree to which each attribute influenced your partner choice with '1' being 'not at all' to '5' being 'extremely'.

1 Not at all **2** **3** Somewhat **4** **5** Extremely

	Partner Characteristics	**Scale**
1.	His attractiveness?	1 2 3 4 5
2.	His age?	1 2 3 4 5
3.	His generosity?	1 2 3 4 5
4.	His intelligence?	1 2 3 4 5
5.	His physique (athletic prowess)?	1 2 3 4 5
6.	His status of employment (job or no job)?	1 2 3 4 5
7.	His profession or job choice?	1 2 3 4 5
8.	His perceived financial stability?	1 2 3 4 5
9.	His education?	1 2 3 4 5
10.	His perceived honesty?	1 2 3 4 5
11.	His perceived ability to be emotionally supportive?	1 2 3 4 5
12.	His perceived desire for a long term commitment that he hoped would lead to marriage?	1 2 3 4 5
13.	His perceived ability to interact with children in a positive manner?	1 2 3 4 5
14.	His perceived maturity?	1 2 3 4 5
15.	His perceived loyalty?	1 2 3 4 5
16.	His perceived resources?	1 2 3 4 5
17.	His perceived ability to be a good provider?	1 2 3 4 5
18.	His health or healthy behaviour?	1 2 3 4 5
19.	His social status?	1 2 3 4 5
20.	His perceived ambitiousness and industriousness?	1 2 3 4 5

I would be happy to have a serious relationship that could lead to marriage with my mate choice.

1 Not at all accurate **2** **3** It's fairly accurate **4** **5** Extremely accurate

In the following space, please provide a written description, approximately a page in length, indicating why you choose the mate that you did.

Appendix E

Demographic Questionnaire

Personal Information

Please answer the following questions:

1. What is your age?

< 17	17	18	19	20	21	22	23	24	25	>25

2. What is your ethnicity? _____

3. What is your religious affiliation, if you have one? _____

4. What year of school are you in?

1	2	3	4	5	6	>6

5. What is your program and major? Program & Major _____

6. What is your marital status?

Single	Relationship < 1 year	Relationship >1 year	Living Together	Married	Separated	Divorced

7. What is your sexual orientation?

Heterosexual	Homosexual	Bi-Sexual

8. Do you have any allergies or dietary restrictions?

_____

9. Do you restrict your caffeine intake?

_____

10. Do you have either type 1 or type 2 diabetes?

_____

11. Do you have any food aversions?

_____

Appendix F

Eating Questionnaire

Instructions: The following questions are concerned with the PAST FOUR WEEKS ONLY (28 days). Please read each question carefully and circle the appropriate number on the right. Please answer all the questions.

	ON HOW MANY OUT OF THE PAST 28 DAYS . . .	No Days	1-5 Days	6-12 Days	13-15 Days	16-22 Days	23-27 Days	Every Day
1	Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight?	0	1	2	3	4	5	6
2	Have you gone for long periods of time (8 hours or more) without eating anything in order to influence your shape or weight?	0	1	2	3	4	5	6
3	Have you tried to avoid any foods which you like in order to influence your shape or weight?	0	1	2	3	4	5	6
4	Have you tried to follow definite rules regarding your eating in order to influence your shape or weight; for example, a calorie limit, a set amount of food, or rules about what or when you should eat?	0	1	2	3	4	5	6
5	Have you ever wanted your stomach to be empty?	0	1	2	3	4	5	6
6	Has thinking about food or its calorie content made it much more difficult to concentrate on things you are interested in; for example, read, watch TV, or follow a conversation?	0	1	2	3	4	5	6
7	Have you been afraid of losing control over eating?	0	1	2	3	4	5	6
8	Have you had an episode of binge eating?	0	1	2	3	4	5	6
9	Have you eaten in secret? (Do not count binges).	0	1	2	3	4	5	6
10	Have you definitely wanted your stomach to be flat?	0	1	2	3	4	5	6
11	Has thinking about shape or weight made it much more difficult to concentrate on things you are interested in; for example, read, watch TV, or follow a conversation?	0	1	2	3	4	5	6

	ON HOW MANY OUT OF THE PAST 28 DAYS . . .	No Days	1-5 Days	6-12 Days	13-15 Days	16-22 Days	23-27 Days	Every Day
12	Have you had a definite fear that you might gain weight or become fat?	0	1	2	3	4	5	6
13	Have you felt fat?	0	1	2	3	4	5	6
14	Have you had a strong desire to lose weight?	0	1	2	3	4	5	6

15. On what proportion of times that you have eaten have you felt guilty because of the effect on your shape or weight? (Do not count binges). Circle the number which applies:

None of the times	**A few of the times**	**Less than half of the times**	**Half the times**	**More than half the times**	**Most of the time**	**Every time**
0	1	2	3	4	5	6

16. Over the past four weeks (28 days), have there been any times when you have felt that you have eaten what other people would regard as an unusually large amount of food given the circumstances?

No	**Yes**
0	1

17. How many such episodes have you had over the past four weeks? _____

18. During how many of these episodes of overeating did you have a sense of having lost control over your eating? _____

19. Have you had other episodes of eating in which you have had a sense of having lost control and eaten too much, but have not eaten an unusually large amount of food given the circumstances?

No	**Yes**
0	1

20. How many such episodes have you had over the past four weeks? _____

21. Over the past four weeks have you made yourself sick (vomit) as a means of controlling your shape or weight?

No	**Yes**
0	1

22. How many times have you done this over the past four weeks? _____

23. Have you taken laxatives as a means of controlling your shape or weight?

No	Yes
0	1

24. How many times have you done this over the past four weeks? _____

25. Have you taken diuretics (water tablets) as a means of controlling your shape or weight?

No	Yes
0	1

26. How many times have you done this over the past four weeks? _____

27. Have you exercised hard as a means of controlling your shape or weight?

No	Yes
0	1

28. How many times have you done this over the past four weeks? _____

	OVER THE PAST FOUR WEEKS (28 DAYS) Please circle the number which best describes your behaviour?	Not at all		Slightly		Moderately		Markedly
29.	Have your weight influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
30.	Have your shape influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
31.	How much would it upset you if you had to weigh yourself once a week for the next four weeks?	0	1	2	3	4	5	6
32.	How dissatisfied have you felt about your weight?	0	1	2	3	4	5	6
33.	How dissatisfied have you felt about your shape?	0	1	2	3	4	5	6
34.	How concerned have you been about other people seeing you eat?	0	1	2	3	4	5	6
35.	How uncomfortable have you felt seeing your body; for example, in the mirror, in shop window reflections, while undressing or taking a bath or a shower?	0	1	2	3	4	5	6
36.	How uncomfortable have you felt about others seeing your body; for example, in communal changing rooms, when swimming or wearing tight clothes?	0	1	2	3	4	5	6

Appendix G

Relationship Assessment Scale (RAS)

Instructions: This is a 7-item instrument designed to measure satisfaction in relationships. It is not limited to marital relationships. Please note that scoring for Items four and seven are reversed. If you are NOT currently in a relationship, please skip this questionnaire and go onto the next one.

1. How well does your partner meet your needs?

Poorly		Average		Extremely Well
1	2	3	4	5

2. In general, how satisfied are you with your relationship?

Unsatisfied		Average		Extremely Satisfied
1	2	3	4	5

3. How good is your relationship compared to most?

Poor		Average		Excellent
1	2	3	4	5

4. How often do you wish you hadn't gotten in this relationship?

Never		Average		Very Often
5	4	3	2	1

5. To what extent has your relationship met your original expectations?

Hardly at all		Average		Completely
1	2	3	4	5

6. How much do you love your partner?

Not Much		Average		Very Much
1	2	3	4	5

7. How many problems are there in your relationship?

Very Few		Average		Very Many
5	4	3	2	1

8. How long have you been in this relationship with your partner? _____

Appendix H

Eating Habit Questionnaire

The following questions refer to your normal eating pattern and weight fluctuations.

Age: _____ Sex: _____ Height: _____ Weight: _____

1. How often are you dieting?

Never	Rarely	Sometimes	Usually	Always

2. What is the maximum amount of weight (in pounds) that you have ever lost within one month (circle one)?

0-4	5-9	10-14	15-19	20+

3. What is your maximum weight gain within a week (in pounds)?

0-1	1.1-2	2.1-3	3.1-5	5.1+

4. In a typical week, how much does your weight fluctuate (in pounds)?

0-1	1.1-2	2.1-3	3.1-5	5.1+

5. Would a weight fluctuation of 5 pounds 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 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. What is your maximum weight ever? _____

11. How many pounds over your desired weight were you at your maximum weight?

0-1	1-5	6-10	11-20	21+

12. When you break your diet do you react by (circle one):

Going right back on the diet	Compensating by eating less for a while	Continue to eat non-diet foods and start the diet another day	Get rid of the food by vomiting or taking laxatives	Not applicable

Appendix I

WRITTEN DEBRIEFING

Thank you for participating in my master's thesis research entitled, "The Effect of Exposure to a Desirable Mate on the Eating Behaviour of Restrained and Unrestrained Eaters – An Evolutionary Perspective.

The purpose of this study was to look toward evolution as the ultimate cause of eating disorders. Behaviour has both proximate and ultimate causes, where proximate causation is concerned with the environmental stimuli that trigger behaviour, and ultimate causation is concerned with the evolutionary significance of the behaviour.

Current theories have offered proximal explanations to the existence of eating disorders. Although they definitely function as contributing factors in the environment, they still fail to explain why males are much less likely to fall prey to the same eating pathology as females, why it declines with age, or why eating disorders are actually occurring. Prior research shows that eating disorders arise out of increased intra-sexual competition between females for evolutionarily desirable mates. Specifically, current conditions in the world have increased females' ability to both control their body shape and their mating behaviour, creating a more competitive environment where ultimately, some females succumb to the competitive pressures through the development of Anorexia Nervosa (Abed, 1998).

Thus, from an evolutionary perspective, female competition for mate selection may be an underlying force driving the development of eating disorders, through their intrasexual competition for mates and their desire to appear attractive. I will investigate this hypothesis utilizing individuals who restrain their eating behaviour as restraint is both a precursor and an analogue of eating disorders. As well, I will be assessing both females who are in committed and uncommitted relationships, as it is my belief that committed females will not be looking for a mate, and thus will not adjust their eating behaviour due to exposure to a potential mate. I believe that uncommitted dieters will eat the least, given that they are still searching for a mate, and thus want to appear as evolutionarily attractive as possible. The purpose of this study is to investigate the relationship between restraint, eating disorders, evolution and mate selection. The hypotheses are as follows: All females will eat less in the presence of a desirable than undesirable mate, single females will eat less than committed females, and restrained, single females will eat the least of all groups.

The reason that we needed to be deceptive about the underlying nature of the study, was to enable the researchers to obtain an accurate picture of whether individuals modify their eating behaviour when exposed to the concept of a desirable mate. As well, the researchers also needed to obtain the most current and up to date weight and height information as it adds to important information that we need for assessing restraint status. As mentioned prior, this information will be kept confidential and anonymous. Due to the nature of the study, the height and weight measurement component had to occur at the

end, and could not be mentioned in the consent form as it would have damaged the validity of the study.

If so desired, participants will be able to access the research findings in the Psychology Department and will be made available in June of 2004. If at any time after the study, you have questions, please feel free to phone the psychology department and talk with the researcher, Sara Robillard, or her supervisor, Dr. Josee Jarry.

VITA AUCTORIS

Sara Robillard was born in 1979 in Thunder Bay, Ontario. She graduated from Fort William Collegiate Institute in 1998 with the Governor General's Award for Academic Excellence. From there she went on to study at Lakehead University where she obtained a Bachelor of Arts with Specialized Honours in Psychology, First Class Standing. She will continue in September of 2004 working toward a Doctor of Philosophy in Clinical Psychology at the University of Windsor.