The importance of positive cognitive processes in psychological well-being

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THE IMPORTANCE OF POSITIVE COGNITIVE PROCESSES IN PSYCHOLOGICAL WELL-BEING

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ABSTRACT

Introduction

Clinical psychologists have traditionally focused on understanding and treating psychological distress, and psychological theories have rarely been applied to understand positive psychological well-being. This project is interested in applying the principles of Cognitive Theory, a well-established model for the mechanisms underpinning psychological disorders, to understanding positive psychological states.

Method

Semi-structured interviews were conducted with undergraduate students to investigate how they think when they feel well. Items derived from these interviews were used in the design of two measures of positive cognition (one of positive core-beliefs and one of positive assumptions). These measures were administered to a larger sample of students, in a battery of questionnaires, examining other psychological variables and well-being. The results were analysed, to investigate the relationship between positive cognition and psychological well-being.

Results

The findings provide evidence in support of the psychometric properties of the two measures, suggesting that positive cognitions can be reliably and validly measured. Correlation analyses indicated a positive relationship between positive cognition and psychological well-being. Regression analyses indicated that positive core-beliefs predict psychological well-being, although self-esteem was the best predictor. Core-beliefs had some unique predictive power, when other variables were accounted for.

Discussion

The findings provide some support for the hypothesis that positive cognitions exist and are related to psychological well-being in a way predicted by cognitive theory. The study also produces two measures of positive cognition, which have the potential to be developed and used in future research. Methodological issues are discussed along with the implications of the findings for theory, clinical practice and future research.

1. INTRODUCTION

Clinical psychologists have traditionally focused their efforts on understanding individuals with poor psychological well-being. The current research is concerned with developing our understanding of positive psychological well-being in particular, by attempting to apply the principles of cognitive theory to understand these states. This introduction begins with a definition of terms and provides a review of the different models and assessments that have been devised to understand and measure psychological well-being. Existing models are introduced, focusing particularly on cognitive theory, an approach for which there is a growing empirical evidence base. Evidence for the existence of positive cognitions (and positive cognitive theory) is critically reviewed and so are studies that have attempted to apply cognitive therapy to address positive psychological well-being. Ways forward in the development of this area are suggested, and a number of hypotheses stated for investigation.

1.1 DEFINITIONS OF TERMS

The field of "well-being" research is extremely broad, extensive and conceptually diffuse (Andrew and Robinson, 1991). The terms positive health, quality of life subjective well-being, psychological well-being, life satisfaction, happiness and others are used interchangeably and there is lack of clarity and consistency concerning the definitions for, and understanding of the overlaps between, these complex constructs (Zautra and Hempel, 1984; Bowling, 1997). This introduction will begin by providing definitions for some of the key concepts in the field of well-being research.

1.1.1 Positive Health

Health is usually referred to negatively, as the absence of disease, illness and sickness (Bowling, 1997). This view is underpinned by a "disease model" of health, where an individual's ill health is understood to be solely attributable to pathological abnormality, indicated by signs and symptoms. The WHO (1948) proposed a definition of health as "*a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*" *p.28*, which suggests a broader conceptualisation of what it means to be healthy. A more recent definition of health (Wright, Brownbridge, Fielding, and Stratton, 1990) defines health in terms of a three dimensional structure; freedom from unpleasant symptoms and sensations, ability to perform conventional roles and duties and possession of physiological, psychological and social resources. There is now greater importance placed on assessing domains such as quality of life, social health and well-being when measuring health status, rather than relying solely on medical outcomes such as mortality and morbidity (Bowling, 2001).

1.1.2 Quality of life

Quality of life is a term that is much used in health-related research. Crawford, Parker and McKinlay (1992) suggest that quality of life is an abstract and complex concept comprising many different factors that all contribute to an individual's personal satisfaction and self-esteem. It is defined as "*a concept representing individuals' responses to the physical, mental and social effects of illness on daily living which influence the extent to which personal satisfaction with life circumstances can be achieved*" *p4*. Crawford et al (1992) stress that measurement of quality of life should aim to assess not only physical well-being, but also individual's perceptions of their well-being, satisfaction and self-worth.

1.1.3 Well-being

Well-being is most often referred to as subjective well-being, which is concerned with how and why people experience their lives in positive ways (Deiner, 1984). It has been defined as "*the degree to which an individual judges the overall quality of his or her life-as-a-whole favourably*" *p8* (Veenhoven, 1991) and is hypothesised to represent a psychological summing up of the quality of an individual's life in society (Andrews and Robinson, 1991).

1.1.4 Psychological Well-being

Psychological well-being has been defined as "*the explicitly evaluative aspect of mental functioning*" (Schmutte and Ryff, 1997, p552), but is most often used to refer to levels of an individual's psychological or psychiatric distress (Bowling, 1997). This conceptualisation understands psychological well-being to be the absence of negative states (e.g. anxiety or depression), like a medical model. It has been suggested that this definition ignores positive functioning and does not adequately define what it means to be psychological well (Ryff, 1989).

1.1.5 Happiness

Happiness has been defined as "*transitory moods of gaiety and elation that reflect the affect that people feel toward their current state of affairs*" (Campbell, Converse & Rodgers, 1976, p4). It is a description of an affective state and refers to a time frame within the recent past, rather than describing an individual's more global feelings about their life.

1.1.6 Summary

The definitions illustrate the considerable overlap that exists between these similar concepts but suggest that well-being (or psychological well-being) is one of a number of variables, that contribute to an individual's overall feelings of quality of life and positive health. The next section aims to examine models of psychological well-being in more detail.

1.2 MODELS OF WELL-BEING

Throughout history, individuals have been preoccupied with trying to understand what it means to be happy and well (Diener, 2000). Well-being has been conceptualised and measured in many different ways, largely reflecting the interests of the theorist. Studies of well-being have been undertaken by economists (Heliwell, 2001), government organisations (Frey and Stutzer, 2000), sociologists (Portes, 1998), public health researchers (Bartlett and Coles, 1998a), psychiatric epidemiologists (Meltzer, Gill, Petticrew and Hinds, 1995) and others, and all differ in the way they conceptualise well-being, the terms used and the variables they measure to serve as an indictor. These methodologies also differ in the extent to which they focus on objective (externally-rated e.g. housing, economic status) and subjective (self-rated) measures of well-being (Johnston, Wright and Weinman, 1995). This study is interested in psychological conceptualisations of well-being and therefore intends to focus on psychological, rather than other models.

Many conceptualisations of psychological well-being understand it to be a lack of distress (Fava, 1999). This has meant that the majority of measures of psychological well-being focus on detecting the absence of psychological well-being i.e. the

prevalence of distress. Bowling (1997) provides a review of measures of psychological well-being which almost exclusively reviews tools used in the detection of psychiatric and psychological disorders, such as depression and anxiety. Bartlett and Coles (1998a) review measures of psychological well-being for use in public health medicine, and refer to the current difficulty in finding assessments that provide some measurement of positive well-being, rather that merely the presence/absence of neurotic symptoms. In particular, they point to the lack of measures that can be used to assess non-clinical adult populations. Two exceptions to this, are the work of Diener (1984) and Ryff (1989) who have both attempted to develop more sophisticated models of well-being that more adequately define what is means to be well.

1.2.1 Subjective Well-Being Model

Diener (1984) proposed that subjective well-being is best understood as arising from two components; an individual's reported feelings of affect which represent a more emotional component, and their rational or intellectual evaluations of their lives, assessed through measures of life satisfaction, which represent a more cognitive component (Andrews and Mckennel, 1980). These components will be reviewed in more detail below.

1.2.1.1 Affect

Affect has been implicated in well-being since the pioneering work of Bradburn (1969) who investigated the structure of psychological well-being. He found positive and negative affect to be independent and concluded that the balance between the two, offered a measure of well-being. This theory has been supported by studies that have found positive and negative affect to be uncorrelated, and to correlate with different

variables (Bradburn, 1969; Diener, Smith & Fujita, 1995). Schmutte and Ryff (1997) suggest that the relationship between affect and well-being is complex. Ratings of affect taken over a time-scale of a few weeks offer a true measure of well-being, but recent ratings of affect (e.g. in the last day) offer an indication of happiness, which may not necessarily be related to well-being. Longer-term ratings of affect (e.g. over the last year) are proposed to provide an indication of an individual's stable affect pattern, reflecting a personality trait, rather than subjective well-being.

1.2.1.2 Life Satisfaction

Life satisfaction is often seen as the key indicator of well-being (Ryff and Keyes, 1995; Diener, Suh, Lucas, and Smith, 1999) and is understood to be a cognitive process by which an individual assesses their progress toward desired goals (George, 1981). It assumes that the individual makes a global assessment of their quality of life based upon their own chosen criteria (Diener, 1984) and it has been shown to be a separate construct from positive and negative affect (Lucas, Diener and Suh, 1996).

1.2.2 Psychological well-being model (Ryff, 1989)

Ryff (1989) suggests that the task of defining the essential features of psychological well-being has never been adequately undertaken. Ryff (1995) argued that existing conceptualisations of well-being do not provide adequate or detailed enough formulations of positive psychological well-being. She suggests that they place too much emphasis on affect, which may at times be in conflict with more global positive functioning. For example, studies have found that the pursuit of one's goals requires effort and discipline, which may be at odds with short-term happiness (Waterman, 1984) and that individuals who have seemingly poor levels of well-being (such as those

who have been abused or unemployed), may still report themselves to be happy (Diener, Sandvik, Seidlitz, and Diener, 1993; Taylor and Brown, 1988).

Ryff (1989) argues that the focus on understanding psychological well-being as a balance between positive and negative affect, and feelings of life satisfaction, has produced measures of well-being that have been extensively evaluated, but that are underpinned by little theoretical rationale. Bradburn's (1969) study for example, provided a definition for the structure of psychological well-being and a way to operationalise happiness, but Ryff (1989) argues this was not the research goal, and that conclusions concerning the nature of happiness were empirically derived (i.e. data driven), after results indicated that measures of affect and functioning did not correlate. Similar arguments have been directed at the way conceptualisations of well-being have been inferred from the life satisfaction literature (Sauer and Warland, 1982). Ryff (1995) concludes that there is more to being well, than feeling happy and satisfied with life, and that comprehensive accounts of psychological well-being need to understand individuals' view about themselves and their lives.

To address the criticisms detailed above, Ryff (1989) devised a multi-dimensional model of psychological well-being based upon psychological and philosophical theory that addresses positive functioning. Psychological theories of positive psychological functioning (Maslow, 1968; Rogers, 1961), life span developmental perspectives (Erickson, 1959; Buhler, 1935; Neugarten, 1973) and positive mental health (Jahoda, 1958) were combined with philosophical formulations of the good life (Russell, 1930; Mill, 1873) and sociological ideals (Antonovsky, 1993) to develop a model of

psychological well-being. The model proposes that six domains are important in individuals' psychological well-being;

- Autonomy
- Environmental mastery
- Personal growth
- Positive relations with others
- Purpose in life
- Self-acceptance

Ryff's model provides a detailed formulation of psychological well-being and the dimensions that might underpin it. Measures have also been developed that allow assessment of individuals' levels of psychological well-being, according to these dimensions. However, Ryff's conceptualisation has met criticism for being prescriptive, concerning the factors that are important in well-being. Diener, Sapyta, and Suh (1998) suggest the crucial factor in well-being to be an individuals' own subjective feelings of what it means to be well, and argue that the model does not address this. It has also been criticised for being informed by exclusively western thinking, which limits its universality (Christopher, 1999). Despite these criticisms, the model provides an account of positive well-being that is underpinned by psychological theory and has allowed measures to be devised to assess positive psychological well-being. The next section reviews measures of psychological well-being.

1.3 MEASUREMENT OF WELL-BEING

As illustrated in the preceding chapter, different models for psychological well-being have been devised and this has led to use of different measures (McDowell and Newell, 1996). The assessments that exist are diverse, both in terms of the life domains they assess, and the methodologies they use, but correspond to the models described in the previous section. McDowell and Newell (1996), in their review of health measurement scales, suggest that measures of psychological health or subjective well-being have focused on evaluating individuals' psychological distress, life-satisfaction and affect.

1.3.1 Measuring psychological distress

The BDI[1] and HADS[2] assess the extent of symptoms of psychological distress and are widely used as measures of psychological well-being. However, the extent to which these measures assess distress, disorder, psychological, emotional, or mental well-being is unclear, and there has been much debate over the way these scales conceptualise well-being (McDowell and Newell, 1996). These assessments focus on negative psychological well-being and individuals are categorised as either "normal" or "abnormal", and the measures tell us very little about individuals with high levels of well-being.

1.3.2 Measuring life satisfaction

Measures of life satisfaction such as the Life satisfaction Index (Neugarten, Havinghurst, and Tobin, 1961) aim to assess an individual's overall assessment of their life, or their feelings concerning any discrepancy between their aspirations and achievements (Campbell et al, 1976). Some explicit or implicit comparison group is

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[1] BDI is the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, and Erbaugh, 1961)
[2] HADS is the Hospital Anxiety and Depression Scale (Zigmond and Snaith, 1983)

usually involved. Global questions about overall life satisfaction or domain specific questions about work, income social relationships and neighbourhoods (Andrews and Robinson, 1991) are usually employed. Measures of life-satisfaction often have acceptable validity, but self-report has been found to be influenced by factors such as mood at time of completion, social desirability and the ordering of items (Deiner, 2000).

1.3.3 Measuring affect

The Affect Balance Scale (Bradburn, 1969), PANAS[3] (Watson, Clark, and Tellegen, 1988) and Oxford Happiness Scale (Argyle, 1987) are all used as single-item indicators of well-being. These focus on measuring individuals' affect responses, particularly to day-to-day experiences.

1.3.4 Measuring other constructs

Other methodologies have been used to assess psychological well-being. These include the administering of measures believed to correlate, e.g. self-esteem, and the use of measures of more global functioning, such as quality of life. Bowling (1997) suggests that most treatment evaluation studies use measures of quality of life as indicators of change. However, these measures focus on objective criteria and have been criticised for not evaluating individuals' subjective perceptions of their well-being (Huppert and Whittington, 2002). Ryff (1995) has devised the Psychological Well-Being Scales (Ryff and Keyes, 1995), based upon her model of positive psychological well-being. They comprise six, 20-item scales, that aim to assess individual's functioning within each of the domains proposed by her model. Studies have been undertaken to evaluate their

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[3] PANAS is the Positive and Negative Affect Scale

psychometric properties, and they have been found to have acceptable validity and reliability (Ryff and Keyes, 1995; Ryff and Singer, 1996).

The preceding sections have provided an introduction to the main theories and measures of psychological well-being. The next section reviews theories that have been developed to understand what leads to psychological well-being.

1.4 PREDICTORS OF PSYCHOLOGICAL WELL-BEING

The models of psychological well-being provide descriptions of what the construct is, but provide little information on how it arises or what factors predict it. This section aims to critically evaluate models that have been derived to try and understand what leads individuals to experience psychological well-being. Two main approaches have been used; the Gap/Ratio approach (Mason and Faulkenbery, 1978) and the Social Psychological Influences Approach (Andrews and Robinson, 1991).

1.4.1 The Gap/Ratio approach

This approach suggests that an individual's feelings of well-being reflect a gap or ratio between what they aspire to and what they perceive themselves as having (Mason and Faulkenbery, 1978). For example the smaller the gap between an individual's aspirations and achievements the higher the level of well-being. This model provides an explanation for individuals who have seemingly better objective levels of well-being than average, but report lower levels of well-being. The idea has been developed to produce Multiple Discrepancies Theory, which is a modelling technique to predict the relative importance of different factors in understanding well-being (Michalmos, 1985). Multiple Discrepancies Theory has been found to account for 50% of the variance in

measures of global happiness and life satisfaction (Michalmos, 1985). However, the approach has been criticised for a lack of empirical evidence to substantiate it (Andrews and Robinson, 1991).

1.4.2 Social Psychological Influences Approach

This approach aims to understand well-being as arising from individual social and psychological factors and researchers have attempted to assess the extent to which well-being can be predicted by these variables. Abbey and Andrews (1985) found 54% of the variance in scores on measures of quality of life, could be explained by participants' reporting of mood and other psychosocial factors. Factors such as age, self-esteem, locus of control and stress have also been found to be predictors of well-being (Deiner, 1984; Andrews and Robinson, 1991). The model has particular relevance for the relationship between psychological variables and well-being and so the evidence is reviewed below.

1.4.2.1 Demographic predictors

Demographic variables are important in predicting health outcome (Wilkinson, 1992) but the factors mediating this relationship are often unclear. Research has found that socio-demographic variables are generally poor predictors of both subjective well-being (Diener, 1984) and psychological well-being (Ryff and Singer, 1996). Age, gender, class, ethnicity, even taken in combination, rarely account for more than 10% of the variance (Veenhoven, 1984). Ryff and Singer (1996) suggest that understanding who does, and does not, possess high well-being, requires closer examination of people's lives and experiences.

1.4.2.2 Life-events/Stress

Life-events are known to provoke stress, have been implicated in disease onset (Bowling, 2001) and are known to impact on psychological well-being (Brown and Harris, 1978). Olinger, Kuiper and Shaw (1987) suggest there is a well known relationship between depression and negative life-events, with depressed persons experiencing more negative life-events than non-depressed controls. The relationship between life-events and psychological well-being however, is not simple and the hypothesis has been criticised for inadequately accounting for individual appraisal (Brown, 1991). For example, divorce may be stressful for some individuals, but a relief for others. It is also argued that life-events result in mixed responses e.g. a baby may bring joy but also sadness at loss of independence, and an accumulation of minor events can also lead to stress (Kanner, Coyne, Schaefer and Lazarus, 1981).

1.4.2.3 Personality

Research has found personality traits to be related to well-being. Positive affect has been found to be associated with extraversion and negative affect with neuroticism (Emmons and Diener, 1985). Costa and McCrae (1980) found individuals' scores on neuroticism and extraversion predicted their scores on the Affect Balance Scale, ten years later. Schmutte and Ryff (1997) investigated the relationship between personality and psychological well-being, as measured by the Psychological Well-being Scales (Ryff, 1996). They found that personality was predictive of well-being, but concluded that the relationship was complex.

1.4.2.4 Psychological Factors

Interpersonal variables are known to be important in the origin of negative psychological states and factors such as self-esteem, self-efficacy and locus of control have been found to predict subjective well-being (Diener et al, 1999). Self-esteem refers to an individual's overall affective evaluation of their worth or value (Rosenberg, 1965) and is known to be one of the strongest predictors of well-being (Diener, 1988). Self-esteem is believed to be important in the aetiology of psychological disorders and specific treatments have been devised to increase individual's self-esteem and consequently their psychological well-being (Fennell, 1999).

An individual's sense of personal control over their life has been found to be related to well-being (Diener, 1988). Internal-external locus of control (Rotter, 1966) differentiates whether an individual's belief system is characterised by internal control (life-events perceived to be dependent on their behaviour) or external control (life-events perceived to be out of their control). Individuals with higher internal locus of control have been found to report higher levels of well-being (Diener et al, 1999). Self-efficacy, the belief that one is able to respond to and control external situations, has also been found to be positively related to psychological well-being and particularly to underpin persistence in the face of barriers and recovery from set-backs (Schwarzer, 1992).

1.4.2.5 Social Factors

Social support is known to modify the impact of illness and to be positively related to well-being (Bowling, 2001; Andrews and Robinson, 1995). It has been proposed that social support serves four functions; increasing self-esteem, providing useful

information, providing practical support and social companionship (Cohen and Wills, 1985). Several models have been proposed for the way in which social support mediates its effects (Singer and Lord, 1984; Cohen, 1988) and these have largely focused on direct mechanisms, e.g. where changes to the individuals' thinking lead to reduced stress, or indirect mechanisms e.g. where other factors lead to changes in behaviour.

1.4.3 Conclusion

The Gap Ratio and Social Psychological Influences approaches provide understanding of the factors that predict well-being. There is considerable empirical support for a relationship between different biopsychosocial factors and psychological well-being, but existing models are largely descriptive, and provide less insight into the mechanisms by which psychological well-being arises.

1.5 INTERIM SUMMARY

The preceding sections have reviewed how researchers have attempted to define, conceptualise and measure well-being. Existing models have been criticised for focusing solely on adverse psychological states, but Ryff's model in particular, attempts to provide a formulation for positive psychological functioning. Research has been conducted to understand the factors that lead to psychological well-being, but little is known about underlying mechanisms. Clinical psychology has considerable understanding of psychological disorders, but this has infrequently been applied to understand positive psychological states. The next section reviews research into psychological well-being, focusing particularly on cognitive theory, an approach that has been particularly effective in understanding and treating psychological disorders.

1.6 CLINICAL PSYCHOLOGY AND PSYCHOLOGICAL WELL-BEING

Clinical Psychology has historically concentrated on understanding and ameliorating psychological distress and has largely been influenced by a disease model of human functioning (Seligman and Csikszentmihayi, 2000). This has led to significant developments in the understanding of, and treatments for, mental health problems, resulting in reduced distress and improved quality of life for many individuals (Gillham and Seligman, 1999). Effective assessment techniques and therapeutic interventions are now available to treat a wide range of psychological disorders previously thought to be incurable or intractable (Roth, Fonagy, Parry and Woods, 1998; Seligman, 1994). Despite the considerable benefit that has resulted from this focus there has been a cost. Psychological understanding has been little applied to understand fulfilled individuals and thriving communities and Seligman (2000) suggests that theorists have neglected the possibility that building strengths could be an important and powerful component in therapy. Fava (1999) highlights that "well-being" and "happiness" do not feature in Bergin and Garfield's (1994) Handbook of Psychotherapy and Behaviour Change, illustrating the lack of interest in this area. It is suggested that clinical psychology needs to shift it's preoccupation with solely repairing the worst things in life, to also building the best qualities in life, which may have implications for the treatment and prevention of mental health difficulties (Seligman and Csikszentmilhayi, 2000; Gillhan and Seligman, 1999).

Clinical psychology has not completely ignored positive psychological well-being. Over forty years ago, Parloff, Kelma and Frank (1954) stressed that psychotherapy should not solely aim to reduce symptoms, but should aim to increase personal effectiveness (Fava, Rafanelli, Cazzaro, Conti and Grandi, 1998a). Ellis and Becker (1982) developed a

version of Rationale-Emotive Therapy, which aimed to improve happiness. It comprised therapeutic techniques to remove the main blocks to personal happiness (shyness, feeling of inadequacy, feeling of guilt etc), but the approach was not developed further and did not subsequently affect clinical practice (Fava, 1999). Horowitz and Kaltreider (1979) devised interventions based on positive states of mind, but these have remained marginal to general psychotherapeutic practice (Fava, 1999). Other therapeutic interventions that aim to address the importance of focusing on positive functioning include the Brief Solution-Focused Therapies (de Shazer and Berg, 1992) and Well-Being Therapy (Fava, 1999), which comprises therapeutic techniques based upon Ryff's model (see later discussion). However, the majority of psychological interventions aim to improve individuals' quality of life by reducing their symptoms of psychological distress.

1.7 COGNITIVE THEORY AND THERAPY

Within the rapid development in the understanding and treatment of psychological disorders, the application of the principles of cognitive theory (Beck, 1976) has been considerable, and particularly efficacious. Cognitive theories and therapies have been devised and evaluated for a wide range of psychological disorders and there is a growing body of evidence that they can be efficacious (Hawton, Salkovskis, Kirk and Clark, 1997; Roth et al, 1998).

1.7.1 Cognitive Theory

Cognitive therapy is a structured, short-term, present oriented psychotherapy, which focuses on solving current problems and modifying dysfunctional thinking and behaviour (Beck, 1995). It is based upon the work of Beck (1970) and Ellis (1962) and

despite being originally devised for the treatment of depression, has now been adapted for a wide range of neurotic and affective disorders (Clark and Fairburn, 1997).

The cognitive model hypothesises that the way people behave (and their emotional and physiological reactions) is not solely determined by external events, but is mediated by the way they think (Brewin, 1988), i.e. it is not a situation itself that determines what people feel, but rather the way in which they construe it (Beck, 1970). The cognitive model proposes that distorted or dysfunctional thinking underpins psychological distress and leads to adverse effects on mood and behaviour.

This distorted thinking is hypothesised to occurs at three levels; negative automatic thoughts (NATs), core-beliefs and assumptions. NATs are quick evaluative thoughts that "pop" into people's minds without deliberation or reasoning, triggered by certain situations. They are rapid and brief and result in emotion. It is hypothesised (Beck, 1970) that NATs reflect underlying core-beliefs. Core-beliefs are beliefs individuals develop in childhood, about themselves, other people and the world. They are deeply held and fundamental to an individual, and in many cases they are rarely articulated, and are regarded as absolute truth (Beck, 1995). The model proposes that they act as an information filter, and when activated, cause individuals to selectively focus their attention on information that confirms the belief, disregarding or discounting information that does not (Young, 1990). This results in the belief being maintained, even though it may be inaccurate or unhelpful. Core-beliefs are characterised as being global, over-riding and over-generalised. The relationship between NATs and core-beliefs is mediated by an intermediate level of cognition called assumptions. Assumptions often take the form of "if...then...." statements (e.g. if I am fat, people

will not like me). They are beliefs that are general and often conditional, but are less absolute than core-beliefs. When activated, assumptions influence how individuals feel and behave.

Cognitive therapy aims to help individuals to challenge their dysfunctional beliefs at all three levels and to develop a thinking style that is more reality based and functional. This leads to an improvement in mood and behaviour. Modification of patients underlying assumptions and core-beliefs is thought to be necessary for longer-term improvement (Beck, 1995).

1.8 COGNITIVE THEORY AND PSYCHOLOGICAL WELL-BEING

Despite providing many techniques and measures for investigating the way people think, feel and behave, the pursuit of understanding about the nature of cognitive processes has mostly exclusively involved attempting to assess levels of "dysfunctional" thinking in clinical populations. Fewer studies have investigated cognitive processes in non-clinical samples or in individuals with high levels of psychological functioning. Harper and Cleese (1999) provide an analogy that highlights that this is somewhat illogical. They propose that if you were trying to learn how to play golf, you would not devote years to studying the world's worst players. Consequently, why has research aiming to understand psychological well-being focused solely on examining processes in individuals with poor psychological functioning? It is proposed that it may be fruitful to use the experimental methods and techniques devised from cognitive theory, to try and understand how people who are psychologically well think, feel and behave.

There have been few attempts to devise a "positive" cognitive theory or a cognitive theory of psychological well-being. However, it could be hypothesised that a positive cognitive model would comprise a number of key components;

- That *positive* automatic thoughts, core-beliefs and assumptions exist
- That when activated, they result in positive emotional states that in turn, influence individual's behaviour.
- That these process might underpin and contribute to "positive psychological states" such as happiness, or psychological well-being, in the same way as negative cognition and emotions contribute to states of psychological distress, such as depression.

The next section aims to review evidence that positive cognition exists and may be related to psychological well-being.

1.8.1 Evidence for "positive" cognitive theory

There has been some attempt to measure positive cognition and to understand the importance of this in psychological disorders. The Positive Automatic Thoughts Questionnaire (ATQ-P, Ingram and Wiskicki 1988) was designed to complement the Automatic Thoughts Questionnaire (Hollon and Kendall, 1980), a measure of negative thinking created for use with individuals with depression. It was designed to evaluate positive changes in thinking as a result of therapeutic interventions and has been found to be valid and reliable in adult (Ingram and Wiskicki, 1988) and adolescent (Jolly and Wiesner, 1996) populations. However, much of the use of the ATQ-P has been in differentiating depression from anxiety (Kendall, Howard, and Hays, 1989) and it has been less used to understand positive psychological functioning. For example, Kendall et al (1989) found that depressed individuals had reduced positive self-talk (as well as

increased negative), but attempts have not been made to evaluate whether the opposite was true of individuals with positive psychological functioning. Schwartz and Garamoni's (1989) proposed the "States of Mind" model which suggests that psychopathology arises because of the relative balance of positive and negative cognition. The model suggests that optimal cognitive functioning consists of a ratio of 2:1 positive to negative thoughts and that this underpins effective coping. A similar "power of non-negative thinking" model was devised by Kendall et al (1989), which also incorporated the role of neutral thoughts. These models have been found to offer insight into different psychological disorders and have been shown to change as a result of successful psychological interventions (Schwartz and Garamoni, 1989), but have not been applied to understand the important components of positive psychological functioning. For example, do very well individuals experience no negative thoughts, experience them but ignore them, (possibly because of an information processing bias, as predicted by cognitive theory) or experience both positive and negative, but the balance between the two is such that they feel very well? There have been few attempts to address these issues, or to develop existing theories to understand the role of positive cognitions in psychological well-being and the mechanism by which they exert their effect.

There are existing measures for negative core-beliefs and assumptions as proposed by cognitive theory. The Young Schema Questionnaire (Young, 1990) is a measure designed to assess negative core-beliefs or dysfunctional schemas. The Dysfunctional Attitude Scale (Weissman, 1979) is a measure of the beliefs and assumptions by which individuals organise their lives. However, extensive literature searches were unable to

highlight details of any studies that have attempted to measure either positive core-beliefs, or positive assumptions.

Despite some evidence in support of the proposed positive cognitive model, the majority of studies have only examined the role of positive cognition in psychological disorders. Less effort has been made to understand the mechanisms by which positive cognitions might exert their effect, and whether they relate to positive psychological states.

1.8.2 Positive Cognitive Therapy

There have been few attempts to apply cognitive therapy to address positive psychological functioning. Gillham and Seligman (1999) highlight that much of the focus of cognitive therapy is in trying to challenge the "downward spirals" observed in many psychological disorders (e.g. Clarks' Panic model, Clark, 1986) by challenging the thinking patterns, which then leads to improved emotional well-being and more functional behaviour. However, they propose that cognitive therapy does more that this and that it also creates "positive spirals" which can be understood as opposites of "negative spirals". For example, a client, through therapy, may begin to have increasing success in the world, which leads to an increase in their cognitions relating to improved control and optimism. This may then mean that they manage situations more effectively and take on greater challenges. This further strengthens their positive beliefs and resulting emotions and behaviours, creating a "positive spiral".

Fava (1999) has devised a short-term well-being-enhancing therapy, based upon Ryff's multidimensional model of psychological well-being. The structure of the therapy uses

techniques from Rational-Emotive Therapy (Ellis and Harper, 1961) and cognitive therapy (Beck, Rush, Shaw and Emery, 1979). For example, clients are asked to keep a diary of episodes of well-being and to rate them on a 0-100 scale. They then focus on identifying automatic thoughts and beliefs that cause them to prematurely interrupt the feeling of well-being. Individuals are assessed using Ryff's measures of psychological well-being and specific interventions are planned aimed at improving functioning within these domains. The treatment has been found to be effective using randomised control trial methodology, for the treatment of residual symptoms in clients with affective disorders, (Fava et al, 1998a) and when provided in combination with cognitive behavioural therapy, for the preventing of relapse of recurrent depression (Fava, Rafanelli, Grandi, Conti and Belluardo, 1998b).

The literature provides some evidence that interventions aimed at enhancing positive psychological functioning may have clinical utility. However, there has been little attempt to develop a model for the mechanism by which positive cognitions might exert their effects, or to significantly adapt cognitive therapy treatments to address positive functioning.

1.9 RATIONALE FOR STUDY

A great deal of research effort has concentrated on devising theories and therapies for disorders of psychological functioning and of particular efficacy, has been the application of the principles of cognitive theory to a wide range of psychological disorders. Despite the understanding these theories have provided, there have been few studies examining how people who have "positive" psychological functioning think. Understanding of psychological well-being has developed considerably in recent years,

and in particular the work of Ryff has resulted in the development of a multi-dimensional theory and measures of psychological well-being. These have the advantage of being underpinned by a theoretical model and also allow the assessment of positive psychological functioning, rather than solely the absence of psychological distress. Despite research efforts to understand the predictors of psychological well-being, subsequent, valid and empirically supported models for the mechanism by which an individual becomes psychologically well, have not been devised. Existing theories are characterised by poor explanatory power and a paucity of supporting evidence. It is proposed that cognitive theory, which has excellent explanatory power in understanding adverse psychological states, may provide a model for the mechanisms by which positive psychological states arise. This study is therefore, interested in investigating the relationship between cognitive theory and psychological well-being.

1.10 AIMS

This study aims to investigate how people think when they feel "well", hypothesising that there will be similar "positive" cognitive processes to those proposed by Beck. If these constructs do exist, the study aims to evaluate whether they can be reliably and validly measured. It will then aim to investigate whether there is a relationship between these positive cognitive processes and psychological well-being, hypothesising that in the same way as negative thinking has been associated with adverse psychological states (i.e. depression), positive thinking should be associated with positive psychological states.

1.11 RESEARCH QUESTIONS

1. Are their similar "positive" cognitive processes to the "negative" cognitive processes proposed in Beck's model of cognitive therapy?
2. Can positive core-beliefs and assumptions be reliably and validly measured?
3. Do "positive" cognitive processes predict psychological well-being?
4. Do "positive" cognitive processes predict psychological well-being better than other variables previously known to predict it?

1.12 HYPOTHESES

1. Positive core-beliefs and assumptions exist and can be elicited through discussion.
2. Positive core-beliefs and assumptions can be reliably and validly measured.
3. There is a relationship between positive cognitive processes and psychological well-being.
4. Positive cognitive processes will predict a significant amount of the variance in psychological well-being compared to other factors known to predict it.
5. Positive cognitive processes will be unique predictors of psychological well-being (i.e. will predict a significant amount of the variance when the other factors are accounted for).

2. METHOD

2.1 DESIGN

The research project comprised two studies;

2.1.1 Study 1

A semi-structured interview, to generate items for use in the construction of the two measures:

- A measure of positive core-beliefs
- A measure of positive assumptions

2.1.2 Study 2

A questionnaire survey, with the aim of;

- Evaluating the psychometric properties of the two measures of positive core-beliefs and assumptions.
- Investigating the relationship between positive cognition and psychological well-being.

2.2 PARTICIPANTS

2.2.1 Study 1

Participants were volunteer under-graduate and post-graduate students, recruited through personal contacts.

2.2.2 Study 2

Participants were volunteers, recruited from an undergraduate student population.

2.3 MEASURES

The assessment battery comprised 11 measures, all of which were self-administered, with the testing time ranging from 25-35 minutes. All measures were chosen for use in the study because they were valid, reliable, brief, simple and quick to complete. The following measures were administered (for copies of assessments see appendix 1).

2.3.1 Measures of positive cognition

2.3.1.1 The Positive Core-beliefs Questionnaire (PCBQ)

The PCBQ was developed in the initial stages of this research project (the method of construction will be detailed in the next section). It is a 27-item measure, which asks participants to rate their belief in a number of statements concerning themselves and the world. The scale is self-administered and participants rate their beliefs on a scale of 0-100. Participant's scores are summed to provide a total score and a mean can be calculated. The psychometric properties of the measure will be detailed in the results section.

2.3.1.2 The Positive Assumptions Questionnaire (PAQ)

The PAQ was developed in the initial stages of this research project (the method of construction will be detailed in the next section). It is a 23-item measure, which asks participants to rate their belief in a number of statements concerning themselves and the world. The scale is self-administered and participants rate their beliefs on a scale of 0-100. Participant's scores are summed to provide a total score and a mean can be calculated. The psychometric properties of the measure will be detailed in the results section.

2.3.1.3 The Positive Automatic Thoughts Questionnaire

The Positive Automatic Thoughts Questionnaire (ATQ-P, Ingram and Wisncki, 1988) is a self-report scale, assessing the frequency of positive thought. The measure was designed using an undergraduate student population. Participants were asked to recall a situation in which they had experienced something positive or were in a good mood, and then asked to attempt to re-experience that situation as vividly as possible. They were asked to write down five thoughts that had occurred to them. The experimenters screened responses and selected items that were unambiguously positive for the measure.

Individuals are asked to rate the occurrence over the last week of 30 positive, self-relevant, cognitions. They are told that they will read a list of self-statements that sometimes "pop into peoples' heads" and are asked to rate how frequently these or similar thoughts, have automatically occurred to them during the last week. They are told to rate how *frequently* the thoughts occurred, not whether they believe them, on a 5-point Likert scale. Responses are rated from 1 (not at all) to 5 (all the time) and responses for all items are summed, to produce a total score (between 30-150).

Ingram and Wisnicki (1988) report a mean ATQ-P score of 103.31 for their original sample and this value is supported in a more recent study by Ingram et al (1995).

Ingram, Kendall, Siegle, Guarino and McLaughlin (1995) provide a review of the psychometric properties of the ATQ-P. They suggest the measure to be reliable, citing studies by Burgess and Haaga (1994), who calculated reliability coefficients for alpha (0.95), inter-item and total scale (0.37-0.77) reliabilities. Baldree, Ingram and Saccuzzo (1991) found the measure to have a split-half reliability coefficient of 0.92. Ingram et al

(1995) conclude that ATQ-P shows adequate convergent and discriminant validity. It was found to be inversely correlated with negative affect states, to conform to theoretical predictions of the states-of-mind model, and to show appropriate relationships with existing measures of cognition. The authors conclude that the ATP-Q is an effective measure of positive self-statement frequency.

2.3.2 Measures of psychological well-being

2.3.2.1 The Psychological Well-Being Scales (PWBS)

The scales of Psychological Well-being (Ryff, 1989) were created, based upon a theoretical model of psychological well-being, which proposes that psychological well-being is underpinned by six domains. The PWBS are structured, self-report instruments that serve as indicators for these constructs (Ryff, 1989). The original scales included 20 items per domain, but 14, 9 and 3-item versions have been developed (the 9-item version will be used in this study). The scales comprise a series of statements with which participants need to agree, or disagree on a six-point Likert scale (1- strongly disagree, 6 - strongly agree). The six scales are scored independently, with high scores indicating high self-ratings of psychological well-being (negative items are scored in reverse). Scores for the six scales can be summed, to provide an overall measure of psychological well-being.

The 20-item measures have good reliability and validity (Ryff, 1989). Internal consistency coefficients range from 0.87-0.93 and test-retest coefficients, 0.81-0.85 (Ryff, 1989). The measures have been found to have adequate convergent validity, with positive correlations (ranging from 0.25-0.73) derived, when compared with existing measures of psychological well-being. Divergent validity was also calculated by

correlating with a measure of negative functioning (i.e. depression) and acceptable coefficients were obtained (-0.3 to -0.6). Published psychometric data for the 9-item versions are not yet available, although Ryff advocates their use (Ryff, 2001, personal correspondence).

2.3.2.2 The Affect Balance Scale

The Affect Balance Scale (Bradburn, 1969) is a measure of general psychological well-being. It comprises 10 items, which measure two dimensions, positive and negative affect, and the balance between the two is believed to be a measure of well-being. The two sub-scales are independent, although both correlate with happiness (Bradburn, 1969). It has been used in a wide variety of settings and populations.

The scale is self-administered and respondents are asked to focus on feelings during the past few weeks and to answer questions in a "yes-no" format. Items are scored and ratings for each scale (positive and negative) are obtained by summing responses. Scores range from 0 to 5 and the affect balance score is calculated by subtracting the score for the negative affect scale from the positive affect scale and adding a constant of 5 (to avoid negative scores). Scores range from 0 to 10 with higher values representing more positive affect balance.

Bowling (2001) concludes that the measure has acceptable levels of validity and reliability, citing a study by George and Bearon (1980), who concluded it to be the best measure of affect. The scale has been correlated against an index of neurotic traits, (0.48, Berkman, 1971) and with morale measures (0.61-0.64, George & Bearon, 1980).

Acceptable reliability coefficients have been reported (Bradburn, 1969) for inter-item (0.19-0.75, positive scale and 0.38-0.72, negative) and 3-day test-retest (0.76).

2.3.3 Psychological variables

2.3.3.1 General Health Questionnaire - 12

The General Health Questionnaire (GHQ) was designed by Goldberg (1978) and is the most commonly used international scale for detecting psychiatric illnesses (generally anxiety and depression) (Bowling, 2001). It was designed as a tool for use in general population surveys, in community and medical settings, and is a measure of "usual state", not of longer-term problems. Goldberg (1992) devised a shortened, 12-item version (used in this study) and it has been found to perform well in detecting psychiatric disorder. The scale is self-administered and comprises 12 items, which ask respondents whether they have recently experienced a particular symptom or item of behaviour. Responses are scored on a Likert scale (0-4) with high scores indicating greater probability of clinical disorder.

Goldberg and Williams (1988) evaluated the psychometric properties of the GHQ-12 and calculated coefficients for internal consistency (Cronbach's alpha, 0.82-0.90), split-half reliability (0.83), and test-retest reliability (0.73). Validity has been evaluated by assessing the measure's sensitivity to detect cases of psychiatric disorder. In the original validation, sensitivity was 93.5% and the specificity in detecting cases of disorder only, was 78.5 %. Johnston et al (1995) suggest that there have been six further studies validating the GHQ-12 against standardised interviews of psychiatric disorder and each produced satisfactory sensitivity and specificity figures.

2.3.3.2 Self-Esteem Scale

The Self-Esteem Scale (Rosenberg, 1965) is the most widely used measure of self-esteem (Johnston et al, 1995). The scale asks participants how much they agree or disagree with ten statements, half of which assess positive self-esteem, and half negative. The measure was designed to be global and brief. The scale is self-administered and participants rate items on a four point scale ranging from strongly agree (1) to strongly disagree (4). For the negative scales, the items are scored in reverse. The scale gives a range of scores from 10-40, with low scores indicating high self-esteem.

There is little data available on the psychometric properties of the RSE scale even though it is widely used (Johnston et al, 1995). Concerning validity, Rosenberg (1965) reports the measure to significantly correlate with self-esteem, assertiveness, sociability and depression, but acknowledges that the items were chosen on face validity. Robinson and Shaver (1973) found the scale to correlate with Coopersmith's Self-Esteem Inventory (0.59-0.60). Johnston et al (1995) cite studies by Blascovich and Tomaka (1993) and Rosenberg (1986), which suggest the scale to have adequate test-retest reliability (0.82-0.88) and internal consistency (Cronbach's alpha 0.77-0.88).

2.3.3.3 The Life-events Scale

The Life-events Scale (Holmes & Rahe, 1967), also known as the Social Readjustment Rating Scale is a 43-item questionnaire, which measures the frequency of different types of life-event, experienced during the last year. It is based on the idea that life-events are stressors, which test our ability to cope, and the strain may make individuals susceptible to illness and mental health problems, such as anxiety and depression

(Holmes and Rahe, 1967). The measure includes life-events such as marriage, death of a partner, pregnancy, problems at work, and holidays, and items are ordered by the degrees of readjustment needed following the event. The scale is self-administered and comprises 43 questions, which ask participants to indicate the life-events they have experienced in the last year. Each life-event is allocated a score and items are summed to produce a total score. Holmes and Rahe (1967) suggest the risk of experiencing physical and or mental illness to be based upon the following normative data; low <149, mild = 150-200, moderate = 200-299, major > 300.

Holmes and Rahe (1967) found the results to be extremely consistent and the scale has been validated for use in different contexts e.g. hospital, (Volicer & Bohannon, 1975) and with different ages (Muhlenkamp, Gress, and Flood, 1975).

2.3.3.4 The Generalised Self-Efficacy Scale

The generalised self-efficacy scale (Schwarzer and Jerusalem, 1992) assesses the strength of an individual's belief in his or her own ability to respond to novel or difficult situations, and to deal with any associated obstacles or setbacks. It is a self-administered, 10-item scale that requires respondents to indicate the extent to which each statement applies to them. For each item there is a four choice response from "not at all true" (1) to "exactly true" (4). The score for each of the ten items is summed to give a total score with the higher the score, the greater the individual's sense of self-efficacy. For comparison purposes, Schwarzer (1993) provides a mean score for a community sample of 29.28 (SD, 4.6). There were no gender or age differences found.

All normative data and psychometric analyses have been conducted on German samples (Johnston et al, 1995), although the measure has been found to have acceptable reliability (internal consistency alphas, 0.82-0.93; test-retest 0.47-0.63), and validity when correlated with constructs such as self-esteem (0.52), internal control beliefs (0.40) and anxiety (-0.54) (Schwarzer, 1993).

2.3.3.5 The Social Support Scale

The Social Support Scale (Sherborne and Stewart, 1991) was developed for patients in the Medical Outcomes Study (MOS, Sherbourne and Hays, 1990). The measure was designed for use in population surveys and reflects more recent conceptual thought on the subjective components of social support (Bowling, 2001). The scale is multi-dimensional and provides a total functional social support score and scores for four subscales. The measure deliberately focuses on subjective feelings of social support rather than objective. The scale is self-administered and participants respond on a five-point choice response scale. For each item, respondents are asked how often each kind of support is available to them if they needed it. Items for each of the sub-scales, and the overall index, are summed to produce totals, with higher scores indicating more support.

Sherbourne, Meredith, Rogers and Ware (1992) provide data suggesting the scale has adequate construct validity, with patients with high levels of social support having better physical functioning and emotional well-being. Factor analysis supported the construction of the scale with four dimensions and an overall index. Sherborne and Stewart (1991) suggest the scale to have acceptable reliability (item-scale correlations between 0.72- 0.90, internal consistency (alphas) >0.91), and to be fairly stable over time.

2.3.3.6 Eysenck Personality Questionnaire – Extraversion

The Eysenck Personality Questionnaire – Revised (EPQ-R, Eysenck & Eysenck, 1991) measures the three dimensions of personality; emotionality (neuroticism), extraversion-introversion and tough-mindedness (psychoticism) and includes a lie scale. The extraversion sub-scale aims to assess the extent of an individual's extraversion characteristics. The scale is self-administered and comprises 23 questions, answered in a yes (1) no (0) format, which ask individuals about themselves, and their lives. Three items are scored in reverse, and the scores for all items are summed to produce a total. Higher scores indicate higher levels of extraversion.

The Extraversion sub-scale of the EPQ has been subject to rigorous evaluation of its reliability and validity and the findings are reviewed in Eysenck and Eysenck (1975). They conclude the measure to have adequate reliability and validity. The extraversion sub-scale was chosen since it has been shown to be associated with psychological well-being, but the other sub-scales of the EPQ-R were not administered to reduce the length of the assessment battery.

2.4 PROCEDURE

2.4.1 Study 1

2.4.1.1 Stage 1

A semi-structured interview was developed by the researcher and their supervisor based upon a methodology used in a previous study (Cooper, Todd, and Wells, 1998).

The interview comprised questions aiming to provide data on the way individuals think, feel and behave when they feel well and the following methodology was used;

- Participants were asked to think of a recent time in their life when they felt that things were going well.
- Several definitions of "being well" were provided to ensure that participants had a good understanding of what was being asked of them.
- They were asked to try and remember a specific moment, during this time, when they remember feeling particularly well.
- They were asked to focus on this time and to try and remember as closely as they could what was happening, and how they were feeling. They were advised to use cues (e.g. what they might have been able to see/smell at the time) to assist them, and were given several minutes to remember as effectively as possible.
- Discussion techniques were then used to explore and elicit the thoughts, feelings and behaviours the individuals were experiencing at this time.
- The "downward arrow" technique, used in cognitive therapy (Burns, 1980), was then used to elicit core-beliefs and assumptions, underlying the way the participants were thinking and feeling at this time.
- This process was continued until all thoughts, feelings and behaviours experienced at the time were elicited.

The interview schedule was piloted several times and revised in response to participant feedback. Minor amendments were made to the initial instructions.

2.4.1.2 Stage 2

The final version of the interview was conducted by the researcher with five participants. The interview was audio-recorded and verbatim notes taken. Interviews

were conducted until it was felt that an exhaustive list of core-beliefs and assumptions had been generated and further interviews were not highlighting new items (i.e. that had not already been derived from interviews with previous participants). The data generated from the interviews, was used to create two measures.

2.4.1.3 Stage 3

Participant responses were analysed, by examining the written notes and listening to the audiotapes, and the positive core-beliefs and assumptions were extracted. This process was also, independently, undertaken by another researcher, to ensure similar items were extracted. The first measure aimed to develop a list of "positive core-beliefs" i.e. deeply held, absolute, positive beliefs the individual may hold concerning themselves and the world around them, for example, "I am lovable". Positive core-beliefs were easily identified during the interview, a definitive list was derived and the Positive Core-Beliefs Questionnaire (PCBQ) was designed.

The second measure aimed to develop a list of "positive assumptions" i.e. a list of positive beliefs or rules the individual might hold about the way they see the world. Positive assumptions are often referred to as "if, then" statements, for example, if people like me, then I am lovable (Greenberger & Padesky, 1995). These were more difficult to access during the interview than positive core-beliefs, since individuals had a tendency to shift from describing positive automatic thoughts, straight to core-beliefs. While some positive assumptions were generated during interviews, there were not enough for a measure. Consequently, attempts were made by the researcher and their supervisor to generate positive assumptions, based upon the automatic thoughts and core-beliefs already obtained. This process involved trying to predict the assumptions

that might mediate the positive core-beliefs and positive automatic thoughts. For example, an individual who holds the core-belief "I am lovable" together with the positive automatic thought "there are many people who care about me" might hold the assumption "if people care about me, it means I am lovable". This process was continued until sufficient positive assumptions were generated and the Positive Assumptions Questionnaire (PAQ) was designed.

For both measures, a decision was taken to use a 0-100 rating scale. This was because this scale is the most similar to what would be used, if undertaking cognitive theory in clinical practice. The two measures developed were piloted on 10 volunteers (trainee clinical psychologists) who provided feedback. Minor revisions were made to the instructions for the PAQ.

2.4.2 Study 2

A link was established with the chair of the university ethics committee, who agreed to facilitate the recruitment of participants. Through this contact, further links were made with the heads of schools from which students would be recruited. These were;

- Psychology
- Geography
- Law
- Biological and Molecular Sciences

Permission was sought to conduct the study and individual lecturers were contacted. Students were recruited *en masse* from lectures, where a brief presentation was made at the beginning, detailing the study rationale. A prize draw was organised so that all

participants who wished, could provide contact details, and their names would be entered into a prize draw to win one of two prizes of £50. Questionnaire packs were handed out which comprised a front sheet for demographic data (age, gender), an information sheet about the study (please see appendix 2 for a copy), an information sheet detailing sources of support, the contact details sheet and copies of the measures. Only those individuals who expressed a willingness to complete the survey participated. The researcher returned to a subsequent lecture, later in the day, to collect completed assessments. Questionnaire packs and prize draw contact details sheets, were collected separately to ensure confidentiality was maintained.

A sub-group of the sample were revisited after a three-week delay and re-completed the Positive Assumptions Questionnaire and the Positive Core-beliefs Questionnaire to allow estimates of test-retest reliability to be ascertained.

2.5 ETHICAL APPROVAL

Ethical approval for both study 1 and 2 was sought from the Oxfordshire Psychiatric Research Committee (OPREC). Once approval had been granted a separate application was made to Oxford Brookes University, who also approved both studies (please see appendix 3, for copies of approval letters). Prior to granting approval Oxford Brookes University asked the researcher to clarify and expand upon a number of methodological issues. Most significantly, there was a concern about how any distress experienced by participants would be dealt with. A separate sheet was included with the questionnaires, detailing local sources of support.

3. RESULTS

3.1 OVERVIEW OF RESULTS SECTION

This section begins with descriptions of the sample's demographic characteristics and provides results for participants' scores on the individual measures, and comparisons with normative data. The main body of the chapter is concerned with presenting the results of the statistical investigations into the main hypotheses.

3.2 MISSING DATA

For measures where only one or two data points were missing, this was dealt with by pro-rating the missing scores. If more than two items were uncompleted for any one measure, then all of the data from that questionniare was excluded from analysis.

3.3 DESCRIPTION OF THE SAMPLE

3.3.1 Study One

Interviews were conducted with 5 participants. They had a mean age of 24.4 (SD=3.36) and there were more females (80%) than males (20%). These individuals were slightly older than those recruited for the main study. The PCBQ and the PAQ were then piloted on 10 clinical psychology trainees who had a mean age of 26.8 (SD=1.48) and there were more females (90%) than males (10%). Clinical psychology trainees were not recruited from the same student population as the main study, but were used because they were able to provide more detailed feedback (because of their specialist understanding) concerning the construction of the measures.

3.3.2 Study Two

There were 227 participants who completed assessments, but three subjects' information was not included in the final analysis (1%), because of incomplete or faulty completion of questionnaires. This produced a final sample size of 224, which is an estimated response rate of approximately 72% (see appendix 4 for calculation). The demographic characteristics of the final sample can be seen in tables 1 and 2. Sixty three (39%) of the participants failed to provide demographic information (i.e. information on age and gender), although fortunately, for most of these, gender could be ascertained from the prize draw information. Participants were aged between 18 and 48 with a mean age of 21.57 years (SD[4], 5.94). There were more women (69%) than men (26%) and to ensure that there was no significant effect of gender, t-tests (or Mann-Whitney test for non-normally distributed variables), were conducted to compare male and females on each of the measures. No significant differences were found between males and females on any of the measures, suggesting that gender was not a confounding variable. Eighty six percent of the sample entered the prize draw.

Table 1: Demographic Characteristics – Age

Measure	Sample			
	n	mean	SD	Min-Max
Age	161	21.57	5.94	18-48
Missing	63			
Total	224			

[4] SD (and SDs) refers to standard deviation(s)

Table 2: Demographic Characteristics – Gender and Prize Draw

Measure		Sample	
		n	%
Gender	Men	58	26
	Women	154	69
	Missing	12	5
	Total	224	
Prize Draw	Yes	193	86
	No	31	14
	Missing	0	0
	Total	224	

Of the 224 participants whose data were used, 65 (29%) were recruited from psychology, 55 (25%) from geography, 66 (29%) from law and 38 (17%) from biological sciences. Analyses were undertaken to evaluate whether these groups were equivalent on the assessments administered. The normality of the data were analysed and with the exception of the Life-events Scale[5] were not found to meet the assumptions for parametric analysis. Attempts were made to transform the data, but this did not result in normality being achieved. A series of Kruskal-Wallis Tests were therefore performed (and a one-sample t-test for LES), with course (four conditions) as the independent variable and the measures administered as the dependent variables. There was a significant main effect of course being taken, for PAQ ($\chi^2_{(3)}=13.15$, $p<0.01$), General Health Questionnaire[6] ($\chi^2_{(3)}=14.90$, $p<0.01$) and Affect Balance Scale[7] ($\chi^2_{(3)}=9.92$, $p<0.05$). Individual post-hoc Mann-Whitney tests indicated that psychologists reported significantly higher scores on the PAQ than lawyers ($p<0.05$), and both

[5] In future, the Life-events Scale will be referred to as LES
[6] In future, the General Health Questionnaire will be referred to as GHQ
[7] In future, the Affect Balance Scale will be referred to as ABS

psychologists and geographers reported significantly higher scores than biological scientists ($p<0.01$). On the GHQ, lawyers and biological scientists reported significantly higher scores (i.e. more psychiatric morbidity) than psychologists and geographers respectively, both comparisons ($p<0.05$). On the ABS, geographers reported higher levels of well-being than lawyers and biological scientists, both comparisons ($p<0.01$).

Despite these statistically significant differences found between the four groups of students, the mean differences were small and it was thought that the statistically significant findings were likely to reflect the large sample size, rather than any meaningful difference. Consequently, no further analyses were conducted to explore the influence of the course.

3.4 CHARACTERISTICS OF THE SAMPLE ON THE MEASURES

The mean and SDs of the sample's scores on the measures are illustrated in table 3. The varying sample sizes reflect those individuals who failed to complete certain measures within the assessment battery.

Table 3: Characteristics of the sample on the measures

Measure	Sample			
	n (missing)	**mean**	**SD**	**min-max**
Positive Core-beliefs Questionnaire	224 (0)	72.37	13.23	4 - 96
Positive Assumptions Questionnaire	224 (0)	63.20	14.72	0 - 93
Positive Automatic Thoughts Questionnaire	224 (0)	93.37	20.65	37 - 141
Psychological Well-being Scales				
Total Score	215 (9)	235.75	31.17	156-303
Autonomy	216 (8)	35.96	7.44	10-54
Environmental mastery	219 (5)	37.71	6.56	23-52
Positive relations	216 (8)	41.75	7.66	19-53
Personal Growth	215 (9)	41.81	6.19	24-54
Purpose in life	217 (7)	40.06	6.38	24-54
Self-acceptance	215 (9)	38.54	8.45	14-54
Affect Balance Scale	223 (1)	6.09	2.00	1 - 10
General Health Questionnaire	223 (1)	2.71	2.92	0 - 11
Life-events Scale	224 (0)	243.56	124.52	0 - 607
Self-esteem Scale	224 (0)	20.27	4.90	10 - 36
General Self-efficacy Scale	224 (0)	29.91	4.20	14 - 40
Eysenck Personality Questionnaire - Extraversion	223 (1)	15.81	5.46	2 - 24
Social Support Survey	224 (0)	77.79	13.58	19 - 95

Where possible, one sample t-tests were undertaken to investigate whether the sample was representative of the normal population. The data were not normally distributed, but Kirkwood (1988) suggests that when a sample size is large (in this case $df = 224$) a normal distribution for the sample mean can be assumed, and statistical advice was that

a one sample t-test was appropriate. No normative data were available for the new measures of positive cognition or for the PWBS (9-item versions).

3.4.1 Positive Cognition

Participants scored a mean total of 93.37 (SD, 20.65) on the PATQ, which is slightly below the mean of 107.15 (SD=18.55) obtained in Ingram and Wisnicki's (1988) original sample. The findings of a one-sample t-test ($t=-9.99$, $p<0.001$) suggested that current participants reported significantly fewer positive automatic thoughts than students in the original sample. However, they reported significantly more positive automatic thoughts ($t=20.90$, $p<0.001$) than has been found in clinical populations (Ingram et al, 1990).

3.4.2 Psychological Well-Being

The sample scored most highly on the Positive Relationships subscale of the PWBS and least on Autonomy, although there do not seem to be large mean differences between the different sub-scales. Overall, the sample reported positive well-being on the Affect Balance Scale (mean=1.1, SD=2).

3.4.3 Psychological variables

Participants' scores on the GHQ were converted to the 0,0,1,1, method of scoring to allow comparisons with normative data (Bowling, 1997). Forty per cent of the sample scored 3 or more on the GHQ which, according to Johnson et al (1995) is indicative of psychiatric disorder. A study investigating health in young people (Prescott-Clarke and Primatesta, 1998) used the GHQ-12 with a cut-off of four or more, as indicative of psychological distress. They found 14% of males and 23% of females to meet the

criteria, which compares with 33% and 29% of males and females in this sample respectively. This suggests that overall, the levels of psychiatric morbidity in the current sample were higher than in the general population.

Participants' self-esteem scores were found to be significantly below ($t=-41.44$, $p<0.01$) those found by Rosenberg (1989), in the general population (mean=34.73, SD=4.86). This suggests the current sample has higher self-esteem than the general population (the Self-esteem Scale is scored negatively).

Participants' scores on the General Self-efficacy scale were similar to those provided by Schwarzer (1993) (mean=29.28, SD=4.6), but a one sample t-test ($t=2.25$, $p<0.05$) suggested there was a significant difference between the groups, with the participants in the current sample reporting slightly lower feelings of self-efficacy.

Both males and females were found to be significantly more extraverted than Eysenck and Eysenck's (1991) original sample of students of the same age (males, $t=2.15$, $p<0.05$; females, $t=3.15$, $p<0.01$).

It was not possible to directly compare participants' scores on the Social Support Survey with a similar sample, since it has not been evaluated in a non-clinical or student population. However, the overall support index (mean=17.79, SD=13.58) was significantly above ($t=8.47$, $p<0.001$) that obtained in the original clinical sample (mean=70.1, SD=24.2, Sherbourne and Stewart, 1991).

Finally, the sample as a whole had experienced a considerable number of life-events and according to the criteria proposed by Holmes and Rahe (1967) were at moderate risk of experiencing physical or mental illness.

3.5 SUMMARY

The results suggest that the current sample is broadly representative of a student population, but with considerable more females recruited than males. Assessment scores suggest that levels of well-being were lower and levels of psychiatric morbidity were higher than might be expected in the general population, although participants reported higher levels of well-being than might be expected in a clinical population.

3.6 INVESTIGATION OF HYPOTHESES

3.6.1 Hypothesis 1: Positive core-beliefs and assumptions exist and can be elicited through discussion

During the semi-structured interviews participants were easily able to access and describe positive cognitive processes. To provide data in respect of the above hypothesis, a brief overview of the types of responses offered by participants will be detailed. It is acknowledged that these have not been subject to rigorous sampling methods and aim simply to provide an illustration of the types of responses generated.

All participants reported to understand what was meant by *feeling well* in the wider sense of the word, and all could describe a time in their life when they felt particularly well, and a specific situation when they experienced the sense strongly. When describing well-being, participants reported emotions such as contentment, excitement, and satisfaction, thoughts such as "isn't life great" and "everything is going to be OK"

and physical sensations such as heart fluttering and feeling warmth. Investigations indicated that feelings of well-being were often underpinned by more global cognitive evaluations. Detailed questioning highlighted positive core-beliefs and assumptions to be underpinning many of the thoughts and emotions described above. For example, in one instance, the thought "isn't life great" was underpinned by the belief "I am successful" and "the future is bright". In several cases, individuals' positive feelings and thoughts concerned their relationships. These were underpinned by views about themselves such as "I am lovable" and "if my partner loves me, then I am worthwhile".

Further evidence in support of the above hypothesis comes from the findings of the pilot and main studies. All participants completed the measures of positive core-beliefs and assumptions without difficulty and the researcher received no verbal or written feedback that the measures did not make sense. The evidence thus suggests that core-beliefs and assumptions exist, and that they can be meaningfully elicited through discussion and a self-report questionnaire.

3.6.2 Hypothesis 2: Positive core-beliefs and assumptions can be reliably and validly measured

The above hypothesis was addressed by investigating the psychometric properties of the PCBQ and PAQ.

3.6.2.1 Pre-Analysis Checks

Kolgomorov-Smirnoff tests revealed that the total scores for the PCBQ ($z = 0.90$; $p = 0.39$) and PAQ ($z = 0.92$; $p = 0.36$) were normally distributed and that it was appropriate for parametric analyses to be conducted.

3.6.2.2 Psychometric Properties of the Positive Core-beliefs Questionnaire

Internal consistency

Pearson correlation coefficients were undertaken to investigate the relationship between all items contained within the PCBQ. All *r* values were found to be significant at $p \leq 0.01$ except one, suggesting all items (except one) within the PCBQ to be correlated. The internal consistency of the PCBQ was calculated and a Cronbach's Alpha coefficient ($\alpha = 0.96$), indicated that 96% of the measured variance was reliable, with only 4% due to random error. Bowling (2001) suggests that alpha coefficients above 0.80 indicate a high level of internal consistency. Cronbach's alpha coefficients were also calculated as if each item had been deleted from the questionnaire. When items were analysed individually, there were none that would have significantly altered the overall alpha value if removed. Item-total correlations were calculated and the resulting coefficients ranged from 0.47 to 0.85 and were all significant at $p<0.001$, suggesting good internal consistency (Kline, 1986).

Test-Retest Reliability

Fifteen participants completed the PCBQ and PAQ a second time, 3 weeks after the original assessment was completed. Test-retest reliability was calculated for the measures. A Kolgomorov-Smirnoff Test on the PCBQ delayed total score ($z = 0.53$; $p = 0.94$) indicated that the data were normally distributed. Pearson correlation coefficients (*r*) were calculated to compare the PCBQ total scores when the original survey was completed and when it was re-completed, after 3 weeks delay. The results ($r = 0.85$; $p<0.001$) indicate a high degree of test-retest reliability. Pearson correlation coefficients were also calculated for each of the individual items and the majority of test-retest correlations were found to be significant at the $p<0.01$ (*r* range 0.58-0.92)

which is defined as modest to very high correlation (Cohen & Holliday, 1982). Item 25 ("I am trustworthy") was not found to be significant ($p=0.12$) although it derived a correlation coefficient of 0.42 which is still defined as a modest correlation (Cohen and Holliday, 1982). Paired-sample t-tests were undertaken to compare individual's total and item scores at the different times and, with the exception of item 20 ("I am optimistic", significant at $p<0.05$) no significant differences were found. The results indicate that the PCBQ has acceptable test-retest reliability over a short time interval, although two of the items were less reliable. A decision was taken to not remove these, since the test-retest data were derived from a small sample ($n=15$) and the reliability of the measure was thought to require further investigation.

Convergent validity

Examining the convergent validity of the PCBQ specifically, Spearman correlation coefficients were calculated to assess the relationship between PCBQ, self-esteem, self-efficacy and GHQ. The results are shown in Table 4.

Table 4: Validity of the PCBQ

	Correlation (ρ) with PCBQ
Self-esteem Scale	-0.65, $p<0.01$
General Self-efficacy Scale	0.52, $p<0.01$
General Health Questionnaire	-0.47, $p<0.01$

Positive core-beliefs were found to be significantly correlated with self-esteem, self-efficacy and GHQ ($p<0.01$). Participants with a higher rating of positive core-beliefs rated their self-esteem and self-efficacy to be higher (on the SES, high self-esteem is indicated with low scores) and symptoms of psychological distress to be lower.

3.6.2.3 Psychometric Properties of the PAQ

Internal consistency

Pearson correlation coefficients were undertaken to investigate the relationship between all items contained within the PAQ. All *r* values were found to be significant at $p \leq 0.01$, suggesting all items within the PAQ to be correlated. The internal consistency of the PAQ was calculated and a Cronbach's Alpha coefficient ($\alpha = 0.94$), indicated that 94% of the measured variance was reliable, with only 6% due to random error, which is a high level of internal consistency. Cronbach's alpha coefficients were also calculated as if each item had been deleted from the questionnaire. When items were analysed individually, there were none that would have significantly altered the overall alpha value if removed. Item-total correlations were calculated and the resulting coefficients ranged from 0.55 to 0.76 and were all significant at $p < 0.001$, suggesting good internal consistency.

Test-retest reliability

A Kolgomorov-Smirnoff test on the PAQ delayed total score ($z = 0.73$; $p = 0.65$) indicated that the data were normally distributed. Pearson correlations coefficients (*r*) were calculated ($r = 0.85$; $p < 0.001$) and indicated a high degree of test-retest reliability. Pearson correlations were calculated for each of the individual items. Only six of the 23 items were found to be significant, although of the remainder, only eight items produced correlation coefficients that were below the value of 0.4, suggested by Cohen & Holliday (1982) to be an acceptable level of reliability. To further investigate the test-retest reliability, paired-sample t-tests were undertaken to compare individual's total and item scores at the different times. Only item nine of the PAQ ("If I get on well with people, it means I am likeable") was found to be significantly different at $p < 0.01$.

Convergent Validity

Spearman correlation coefficients were calculated to assess the relationship between the PAQ, self-esteem, self-efficacy and GHQ. The results are shown in Table 5.

Table 5: Validity of the PAQ

	Correlation (*r*) with PAQ
Self-esteem Scale	-0.16, $p<0.05$
General Self-efficacy Scale	0.15, $p<0.05$
General Health Questionnaire	-0.21, $p<0.01$

Positive assumptions were found to be significantly correlated with self-esteem and self-efficacy, which suggests that there is a significant relationship between positive assumptions and these constructs. However, the results should be interpreted with caution, as the correlation coefficients were all low. The measure was also negatively correlated with GHQ score suggesting that individuals with higher ratings of assumptions reported fewer symptoms of psychological distress. Again, this correlation was also relatively low.

3.6.2.4 Further investigations of validity

Convergent validity was also assessed by examining the relationship between the three measures of cognition, which cognitive theory would predict would be positively correlated. Before all analyses, Kolgomorov-Smirnoff Goodness of Fit tests were undertaken to ensure the data were normally distributed. Pearson correlations were undertaken and Table 6 below illustrates the correlation coefficients, which were all found to be significant ($p<0.01$), suggesting participants' scores on the three measures were

positively related. However, the correlations between the PAQ and the PATQ and PCBQ are moderate, as defined by Cohen and Holliday (1992).

Table 6: Correlation coefficients between the positive cognition measures

	PATQ	PCBQ	PAQ
PATQ	-	0.61	0.23
PCBQ		-	0.40
PAQ			-

Cognitive theory would also predict that the three measures of positive cognition would be correlated with positive affect (as measured by the positive affect subscale of the Affect Balance Scale). Spearman's correlations (since the data were not normally distributed) were undertaken and Table 7 below illustrates the correlation coefficients.

Table 7: Correlation coefficients between positive cognition and positive affect

	PATQ	PCBQ	PAQ
Affect Balance Scale - positive affect	0.31	0.31	0.20

The PATQ, PCBQ and PAQ were all significantly ($p<0.01$) positively related to positive affect, although according to Cohen and Holliday's (1992) criteria, these are all defined as low correlations. The results provide some evidence that the measures are positively related to positive affect, although the relationship may not be very strong.

3.6.2.5 Conclusions

The results indicate that the PCBQ has shown acceptable reliability and validity but the findings provide rather less clear evidence concerning the psychometric properties of the PAQ, particularly in relation to test-retest reliability.

3.6.3 Hypothesis 3: There is a relationship between positive cognitive processes and psychological well-being

Pearson correlations (and Spearman's for the ABS) were conducted to investigate the relationship between the measures of positive cognition and psychological well-being. The results (see table 8) indicate that all correlations were significant at $p<0.01$, except between positive assumptions and PWBS, significant at $p<0.05$.

Table 8: Correlation between positive cognition and psychological well-being

	Psychological well-being scales	Affect Balance Scale
PATQ	0.49	0.39
PCBQ	0.63	0.42
PAQ	0.14	0.21

3.6.3.1 Pre-analysis checks

There were 213 cases included in this analysis as 11 were removed due to missing data. Five independent variables[8] were found to be significant predictors, meaning the ratio of cases to IVs is approximately 43 to 1, which meets the minimum requirement of a 5 to 1 cases to IV ratio and a minimum case number of 100 as recommended by Tabachnick and Fidell (1989). The correlation coefficients between all variables were calculated and examined. Sixty per cent of these were found to be significant at $p<0.01$ and it was therefore appropriate to continue with regression analyses.

Unfortunately, because of an administration error, demographic information for a subset of the sample (geography students) was unavailable. This posed a difficulty since the

[8] In future, independent variable(s) will be referred to as IV(s) and dependent variable(s) as DV(s)

intention was to include demographic variables in the regression analyses as potential predictors of psychological well-being. This meant that geography students' data could not be included, which would reduce the sample size by a quarter. To address this, following statistical advice, initial regression analyses were undertaken, including demographic data (i.e. with the geography sub-sample excluded). The results indicated that neither age nor gender were significant predictors of psychological well-being on either outcome measure. Consequently, when the full regression analyses were conducted, it was felt appropriate to exclude demographic variables, since they were not significant predictors.

An enter multiple linear regression was performed to calculate the proportion of the variance in psychological well-being predicted by the three measures of positive cognition. The enter method was used to ensure that the maximum variance in psychological well-being was predicted by the measures of positive cognition i.e. all three variables were forced into the regression equation. Two separate analyses were conducted using the two different measures of psychological well-being (the Psychological Well-being Scales and the Affect Balance Scale). The PWBS total score was entered as the dependent variable and the PATQ, PCBQ and PAQ were entered as independent variables. Using the enter method a significant model emerged. The regression equation was significant, $F_{(3, 211)} = 53.11$, $p < 0.001$ and altogether, 43% of the variability in psychological well-being ($R^2 = 0.43$) was predicted by knowing scores on the positive cognition measures. Table 9 illustrates the multiple regression table and the significant variables.

Table 9: Hypothesis 3 - Regression equation (PWBS)

	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
(Constant)	133.35	10.07	13.24	.000
PATQ	0.27	0.10	2.71	.007
PCBQ	5.04E-02	0.01	8.35	.000
PAQ	-1.41E-02	0.01	-2.57	.011

The PATQ (t=2.71) and PCBQ (t=8.35) were significant positive predictors at $p<0.01$ and the PAQ (t=-2.57) was a significant negative predictor at $p<0.05$.

The analysis was re-run with the Affect Balance Scale total score as the dependent variable. A significant model resulted ($F_{(3, 219)} = 17.47$, $p<0.001$) although only 19% of the variance ($R^2 = 0.19$) was accounted for. Table 10 illustrates the multiple regression table and the significant variables.

Table 10: Hypothesis 3 - Regression equation (ABS)

	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
(Constant)	0.90	0.75	1.19	0.24
PATQ	2.30E-02	0.01	3.10	0.002
PCBQ	1.16E-03	0.00	2.55	0.01
PAQ	5.41E-04	0.00	1.39	0.17

The PATQ was the most powerful significant predictor (t=3.10, $p<0.01$) followed by the PCBQ (t=2.55, p=0.01). The PAQ was not found to be significant.

The results provide evidence of a relationship between the positive cognitive measures and psychological well-being, although this was stronger for the PCBQ and PATQ. Individuals who reported higher scores on the PCBQ and PATQ also reported higher psychological well-being.

3.6.4 Hypothesis 4: Positive cognitive processes will predict a significant amount of the variance in psychological well-being compared to other factors known to predict it.

3.6.4.1 Psychological Well-Being Scales

A stepwise multiple linear regression was performed to determine which factors contributed to an individual's reported feelings of psychological well-being, as measured by the PWBS. The stepwise method was used to generate the best predictive model for the variance in psychological well-being, based upon the psychological variables. A stepwise method enters each variable individually, and selects or rejects it based upon its predictive power. The PWBS total score was entered as the DV and the psychological variables as the IVs.

Using the stepwise method, a significant model emerged. The regression equation was significant, $F_{(4, 208)} = 79.54$, $p<0.001$. Altogether, 61% of the variability in psychological well-being ($R^2 = 0.61$) was predicted by knowing scores on four independent variables. Table 11 below, shows the multiple regression table and the significant predictor variables.

Table 11: Hypothesis 4 - Regression Equation (PWBS)

	R^2	Unstandardized Coefficients		t	Sig.
		B	Std. Er.		
(Constant)		160.03	22.14	7.23	.000
Self-esteem Scale	0.47	-2.53	0.39	-6.55	.000
Social Support Survey	0.54	0.67	0.10	6.38	.000
Positive Core-beliefs Questionnaire	0.59	1.90E-02	0.01	3.61	.000
General Self-efficacy Scale	0.61	1.28	0.42	3.07	.002

The regression equation revealed that self-esteem was the strongest predictor of psychological well-being ($t=-6.55$, $p<0.001$), followed by social support ($t=6.38$, $p<0.001$), positive core-beliefs ($t=3.61$, $p<0.001$) and self-efficacy ($t=3.07$, $p<0.01$). Positive automatic thoughts, positive assumptions, extraversion, and life-events were not found to be significant predictors. Following analysis, the assumptions of normality, linearity and homoscedasticity of residuals were investigated and found to be met.

3.6.4.2 Affect Balance Scale

A stepwise multiple linear regression was performed to determine which factors contributed to whether an individual reported feelings of psychological well-being as measured by the ABS. The Affect Balance Scale was entered as the DV and the other variables as the IVs. Using the stepwise method, a significant model emerged, $F_{(4, 216)} = 37.545$, $p<0.001$. Altogether, 41.0% of the variability in psychological well-being ($R^2 = 0.41$) was predicted by knowing scores on four independent variables. Table 12, shows the multiple regression table and the significant variables.

Table 12: Hypothesis 4 - Regression Equation (ABS)

	R^2	Unstandardized Coefficients		t	Sig.
		B	Std. Er.		
(constant)		11.43	1.28	8.91	.000
General Health Questionnaire	0.31	-0.16	0.02	-6.76	.000
Self-esteem Scale	0.37	-0.13	0.03	4.41	.000
Eysenck Personality Questionnaire	0.40	6.86E-02	0.02	3.45	.001
General Self-efficacy Scale	0.41	-6.29E-02	0.03	-2.09	.038

Examination of the regression equation revealed that GHQ was the strongest (negative) predictor of Affect Balance Scale ($t=-6.76$, $p<0.001$), followed by self-esteem ($t=-0.43$, $p<0.001$), extraversion ($t=3.45$, $p<0.01$) and self-efficacy ($t=-2.09$, $p<0.05$). The positive cognition measures, life-events and social support, were not found to be significant predictors. Self-efficacy was found to be negatively related to well-being, i.e. individuals with lower ratings of self-efficacy, reported higher well-being, which is not what the literature would predict. Following analysis, the assumptions of normality, linearity and homoscedasticity of residuals were investigated and found to be met. The positive cognition measures were not found to predict Affect Balance Scale and so further analyses using this measure were not undertaken.

3.6.5 Hypothesis 5: Positive cognitive processes will be unique predictors of psychological well-being (i.e. will predict a significant amount of the variance when the other psychological variables are accounted for).

A hierarchical multiple linear regression was performed with PWBS as the dependent variable. The independent variables were entered in the following blocks;

1. The measures of self-esteem, self-efficacy, GHQ, social support and life-events. The enter method was used to ensure that all non-cognitive psychological variables were included in the analysis, ensuring the maximum predictive power.

2. The PATQ, PCBQ and PAQ. The stepwise method was used to ensure that only variables that significantly improved the predictive power were included.

Model One

The regression resulted in a significant model. The regression equation was significant, $F_{(6, 212)}=49.72$, $p<0.001$. Altogether, 59% of the variance ($R^2=0.59$) in psychological well-being was predicted. Examination of the regression equation revealed that self-esteem was the most significant predictor ($t=7.73$, $p<0.01$), followed by social support ($t=5.98$, $p<0.01$), and self-efficacy ($t=3.65$, $p<0.01$). Life-events, GHQ and extraversion did not significantly predict well-being.

Model Two

The addition of the measures of positive cognition significantly contributed to the prediction of psychological well-being. The equation remained significant at $F_{(7, 212)}=45.75$, $p<0.001$ and the amount of predicted variability increased to 61.0% ($R^2=0.61$). The R^2 change between the first and second blocks was significant ($F_{change\ (1, 21)}=9.56$,

p<0.01) and resulted in a 1.8% increase in the amount of variance accounted for. Table 13 illustrate the multiple regression table with significant predictors for the final model.

Table13: Hypothesis 5 - Regression Equation

	Unstandardized Coefficients		**t**	**Sig.**
	B	Std. Er.		
(constant)	164.68	22.57	7.30	.000
Self-esteem Scale	2.50	0.42	6.02	.000
General Self-efficacy Scale	1.19	0.42	2.82	.005
Social Support Survey	0.62	0.11	5.74	.000
Positive Core-beliefs Questionnaire	1.702E-02	0.01	3.09	.002

Examination of the regression equation revealed that PCBQ was the only significant predictor (t=3.09, p<0.01). The PATQ and PAQ did not significantly add to the prediction of well-being.

Following analysis, the assumptions of normality, linearity and homoscedasticity of residuals were investigated and found to be met. The results suggest that psychological well-being was best predicted by self-esteem, but that positive core-beliefs were uniquely predictive in addition to the other variables.

4. DISCUSSION

This chapter will cover four areas: summary of findings of the investigations into the main hypotheses, interpretations of the findings, limitations of the study and implications for clinical practice and future research.

4.1 SUMMARY OF RESEARCH FINDINGS

4.1.1 Overview of study

Items were derived for the construction of two measures of positive cognition and these were administered to 224 university students in a battery with measures of psychological well-being and other psychological variables (e.g. self-esteem). Analyses were conducted to investigate the psychometric properties of the measures, and to examine the relationship between the psychological variables and psychological well-being.

4.1.2 Investigation into main hypotheses

Hypothesis 1: Positive core-beliefs and assumptions exist and can be elicited through discussion.

The results of the semi-structured interviews indicated that participants were able to self-report positive core-beliefs and assumptions. This is supported by the findings of the main study, where participants were able to complete the measures of core-beliefs and assumptions.

Hypothesis 2: Positive core-beliefs and assumptions can be reliably and validly measured.

Positive Core-beliefs Questionnaire

The PCBQ was found to have a high level of internal consistency as reflected in the correlations between individual items and full-scale alpha coefficients. All item-total correlations were found to be acceptable, although the strength of the relationship varied. Test-retest reliability for both the total score, and individual items, was acceptable and this was supported by comparison of mean scores. The results provide evidence in support of the validity of the PCBQ. It was found to positively correlate with the PATQ and PAQ, a measure of positive affect, self-esteem and self-efficacy and to negatively correlate with psychological distress. These relationships are in line with what theory would predict.

Positive Assumptions Questionnaire

The PAQ was found to have a high level of internal consistency as reflected in the correlations between individual items and full-scale alpha coefficients. All item-total correlations were found to be significant with acceptable correlation coefficients. Test-retest reliability calculations suggested the PAQ total score to have adequate reliability, although individual item calculations indicated that only six items were significant at $p<0.05$, and only 15 items produced correlation coefficients above the acceptable level. Comparisons between mean scores at the different times, indicated that scores on two of the items were significantly different, suggesting poor levels of reliability for these items. The PAQ was found to significantly, positively correlate with the PATQ and PCBQ and with positive affect, although the coefficients were low. Investigations into the convergent validity of the PAQ highlighted that the measure was significantly

correlated with self-esteem, self-efficacy and GHQ, although the correlation coefficients were again low.

Hypotheses 3: There is a relationship between positive cognitive processes and psychological well-being.

Correlation analyses indicated positive relationships between positive cognition and psychological well-being. The PCBQ and the PATQ both had high levels of correlation with the PWBS and acceptable levels with the Affect Balance Scale. The PAQ was significantly correlated with Affect Balance Scale and PWBS, but the correlation coefficients were low. Regression analyses indicated that 41% of the variance in psychological well-being, as measured by the PWBS was predicted by the positive cognition measures, but only 19% of the variance in the Affect Balance Scale. PCBQ and PATQ were the best predictors for the two measures respectively. The PAQ was a poorer predictor of psychological well-being.

Hypothesis 4: Positive cognitive processes will predict a significant amount of the variance in psychological well-being compared to other factors known to predict it.

The relationship between the psychological variables and psychological well-being was different for the two different measures of psychological well-being. Regression analyses indicated that 61% of the variance in PWBS total score was predicted by the psychological variables, and that self-esteem was the best predictor. Social support, positive core-beliefs and self-efficacy were also significant predictors. Positive assumptions and automatic thoughts were not found to predict psychological well-being. The ABS was best predicted by psychiatric morbidity, self-esteem, extraversion

and self-efficacy. The positive cognition measures did not significantly predict psychological well-being, as measured by the Affect Balance Scale.

Hypothesis 5: Positive cognitive processes will be unique predictors of psychological well-being

The results indicated that positive core-beliefs were unique predictors of psychological well-being as measures by the PWBS. Positive core-beliefs accounted for a significant amount of the variance when the other psychological variables were accounted for. However, the proportion of the additional variance was small (1.4%).

4.2 INTERPRETATIONS OF FINDINGS

4.2.1 Positive Cognitive Theory

The findings provide some support for the idea that positive cognition (automatic thoughts, assumptions and core-beliefs) exist and operate in a way predicted by cognitive theory. The three cognitive measures were found to be positively related to each other and importantly were all found to relate to positive affect. However, the strengths of these relationships differed and the results for the different measures will be examined individually below.

4.2.1.1 Positive Core-beliefs

The findings for the PCBQ were most favourable. Positive core-beliefs were found to be measurable in a reliable way and were found to relate to other positive cognition measures and psychological variables such as self-esteem, self-efficacy and psychiatric morbidity, in a way predicted by theory.

4.2.1.2 Positive Assumptions

The data for the PAQ were less clear and two possibilities arise;

- That the theory is not upheld for positive psychological states and that positive assumptions do not exist in the same way.
- That positive assumptions do exist, but the PAQ does not adequately measure them.

There is some evidence that positive assumptions may not exist in the same way as negative assumptions do in psychological disorders. During the semi-structured interviews it was difficult to elicit positive assumptions, with individuals tending to go from describing positive automatic thoughts straight to core-beliefs, which suggests they may not exist. Many of the items for the PAQ were generated by the researcher and their supervisor (based on interview findings and knowledge of negative assumptions) but it is possible that these do not represent actual cognitive phenomena.

However, the data provide some support for the existence of positive assumptions. The PAQ has high levels of internal consistency, which suggests that the measure is measuring something (as opposed to random scoring of items). It also correlates with the other measures of positive cognition, which provides some evidence of validity. The measure had poor test-retest reliability and the relationship between positive assumptions and the other psychological variables was weak. Little is known about the validity and test-retest reliability of the Dysfunctional Assumptions Schedule (the negative equivalent of the PAQ, Oliver and Baumgart, 1985), however, in the original validation study the validity was evaluated by correlating solely against the BDI. It was found to be negatively correlated, but only with coefficients of 0.4, suggesting that the relationship between negative assumptions and mood may not be strong. In the current

study, the PAQ was found to be significantly negatively correlated with the GHQ, a similar assessment of anxiety and depression, but in line with the findings of Oliver and Baumgart (1985) the correlation coefficient was low.

It is possible that theory may not predict a strong relationship between positive assumptions and mood. Positive assumptions might be expected to relate to more global feelings of well-being (more like a trait variable) and less likely to predict more state variables, such as mood. Theory might also not predict a strong relationship between positive assumptions and other psychological variables such as self-esteem and self-efficacy. Positive assumptions resemble rules that individuals choose to live their lives by, and do not directly concern self-evaluative statements. Consequently, one might predict that the relationship between positive assumptions and these variables would be less strong that core-beliefs. The findings of this study do not allow definitive conclusions to be derived concerning the existence of positive assumptions, or the psychometric properties of the PAQ. However, the results provide enough evidence in support, to warrant further investigation, as indeed is needed for the DAS.

4.2.1.3 Positive Automatic Thoughts

Positive automatic thoughts were found to be correlated with the other cognition measures and with positive affect, which is what would be predicted by cognitive theory. This finding supports Ingram and Wisnicki (1988) who found the PATQ to be negatively related to depression as measured on the BDI. However, they did not examine the relationship between PATQ and positive affect. Cognitive theory would also predict that positive automatic thoughts would be more directly linked to affect than other cognition constructs, but there was little difference between the measures.

4.2.2 Positive cognition and psychological well-being

A model of positive cognitive theory would predict that, in the same way as negative psychological states are underpinned by negative cognition, positive psychological states should also be underpinned by positive cognition. The results provide some support for a relationship between positive cognitive processes and psychological well-being, but the strength of this relationship differed for the different positive cognition measures and measures of psychological well-being.

Examination of the correlation coefficients and regression analyses suggest that both positive core-beliefs and automatic thoughts are related to psychological well-being as measured on both the PWBS and the ABS. This suggests that individuals who hold positive core-beliefs and automatic thoughts are more likely to self-report higher levels of psychological well-being. The PAQ was only weakly related to psychological well-being and there are a number of possibilities for why this might be.

As discussed the PAQ may be a poor measure and consequently the findings are invalidated. However, it is also possible that theory might not predict a particularly strong relationship between positive assumptions and psychological well-being. This is the case for negative assumptions, which were found to be only weakly related to negative mood (Oliver and Baumgart, 1985). One hypothesis might be that if an individual endorses the assumption "If I do well it means I am successful" they pre-dispose themselves to activating their core-belief "I am successful", thus leading to increased psychological well-being. However, another hypothesis might be, that an individual who holds the belief "I am successful" unequivocally, and would disagree with this assumption, since their feelings of success are not dependent upon doing well. This individual for example would

believe they are successful, whether they do well or not. This difficulty is reflected in the relationship between assumptions and psychological distress as defined in cognitive theory. Theorists (Greenberger and Padesky, 1995; Beck, 1995) argue that it is not merely the presence of negative assumptions that predisposes individuals to psychological distress, but that it is when assumptions are held and adhered to in an inflexible and rigid way that there is some difficulty.

4.2.3 Psychological well-being, positive cognition and other psychological variables

When the measures of positive cognition were entered in comparison with the other psychological variables, core-beliefs were found to be the only significant cognitive predictor of psychological well-being (as measured by the PWBS). In addition, core-beliefs were the only uniquely predictive cognitive variables. This suggests that positive automatic thoughts and assumptions are less useful in predicting psychological well-being. However, it is possible that this reflects their relationship to positive core-beliefs. The PCBQ is the most powerful predictor of psychological well-being and since the three positive cognitions are inter-related, any predictive power they might have (in a stepwise regression) could be masked.

Self-esteem was found to be the best predictor of psychological well-being which suggests that it remains the most useful measure in understanding the factors that predict psychological well-being. There is considerable overlap between self-esteem and positive core-beliefs, since both require individuals to make evaluations about how they feel about themselves (supported by the data, indicating a high correlation between the two variables).

Consequently, the question can be posed, why do we need a measure of positive core-beliefs when we already have self-esteem, a better predictor of psychological well-being? Firstly, when entered in a hierarchical regression, positive core beliefs were found to have a unique predictive capacity (despite the additional proportion of the variance accounted for being small), which suggests that the construct and the PCBQ as a measure, is useful over and above self-esteem. Cognitive models of self-esteem have been developed (Fennell, 1999), although the mechanisms of action are less understood and have a poorer empirical evidence-base. The two constructs are likely to be related, given that self-esteem is hypothesised to be underpinned by core-beliefs. There is a need for further research to investigate the relationship between these two variables and the mechanisms underlying their unique predictive power for psychological well-being.

Examining the results for the Affect Balance Scale, they differ considerable from those for the PWBS. GHQ score was found to be the best predictor of ABS, followed by self-esteem, extraversion and self-efficacy. None of the measures of positive cognition were significant predictors when compared with the other psychological variables.

The lack of consistency in the findings for the two psychological well-being measures suggest that they are measuring different aspects of psychological well-being. It also suggests that these different aspects of well-being are predicted by different psychological variables. The main difference between the two measures is the extent to which they focus on affect. Ryff's model and measures of psychological well-being (Ryff, 1989) specifically aimed to improve upon existing measures of well-being which she felt were too focused on affect. The Affect Balance Scale assesses well-being solely by assessing the incidence of positive and negative affect in the recent past.

Consequently, it is perhaps not surprising that scores on this measure are best predicted by the GHQ, a measure that assesses the extent of affective symptoms recently experienced. It is possible that Ryff's scale may place more emphasis on assessing the broader range of psychological attributes that may underpin well-being (e.g. "I like most aspects of my personality") while the Affect Balance Scale may focus more on the feelings people experience when they feel well ("On top of the world").

It seems more likely (theoretically) that positive core-beliefs would predict global well-being (PWBS) a more trait variable and not predict transitory affective states, which are more of a state variable. For example, one difference between the PWBS and the ABS concerns the time-scale of reference. The ABS asks individuals to describe their feelings in the last couple of weeks whereas the PWBS does not provide a time-scale and asks individuals for their views concerning the lives in a more global sense. This also suggests that the two measures may tap different aspects of psychological well-being, i.e. state versus trait features and that core-beliefs may be a better trait predictor.

4.2.4 Summary

Overall, there seems some evidence in support of the idea that positive cognitions exist and that they are related to positive psychological states. The next sections aim to detail some of the methodological limitations of the study and to discuss the theoretical, clinical and research implications of the study.

4.3 METHODOLOGICAL CONSIDERATIONS

The main methodological limitation concerns the generalisability of the findings to the wider adult population. The study was conducted on students and there were more females recruited than males. Consequently, the sample were likely to be younger, better educated and with more women represented, than the normal population. This cohort effect may also have significantly impacted the selection of items for the two measures, leading to an age and cultural bias. For example, items such as "I am ambitious" or "I am independent" may be less representative of the positive core-beliefs experienced by older adults or individuals from non-western society. The PCBQ and PAQ may be biased to reflect the positive core-beliefs and assumptions of young adults and the validity of the measures to the wider general population needs to be further investigated.

The sample's mean score on the assessments also indicated higher levels of anxiety and depression than might be expected in the general population. It could be hypothesised that students are under considerable stress as a result of the academic demands, financial concerns, changing life circumstances and relationships that often accompany the academic lifestyle, and this is reflected in their levels of anxiety and depression. Participants also reported a significant number of recent life-events. This is a particular concern since the main aim of the study was to investigate psychological well-being and suggests that some of the sample might not be particularly psychologically well. The results should be interpreted with caution, particularly when trying to generalise the findings and further research needs to replicate the findings within a non-student population.

However, the sample size and response rate were good for the main study, suggesting the sample to be adequately representative of a student population. Initial between-course analyses indicated some significant differences between students from different courses, on some measures, and future analyses may wish to further examine these differences.

It might have been beneficial to undertake a more detailed study to investigate the beliefs underpinning psychological well-being prior to the design of the measures, possibly with the use of more formal qualitative methods. It is also possible that further interviews might have highlighted additional items for the measures, although efforts were made to ensure an exhaustive list of items were generated. Inter-rater reliability (for the interviews) would also have been useful. More importantly, more interviews, and more detailed interviews, might have provided further information concerning the existence and nature of positive assumptions, which proved more difficult to access and measure than core-beliefs. However, as noted earlier, there are several unresolved issues with the nature and role of assumptions in cognitive therapy and further research is needed to address these issues.

It is acknowledged that it might have been beneficial to attempt to improve the psychometric properties of the two measures before the data were used in the main study. However, in the current design it was not possible to validate the measures before the main study. The reliability data were available before the main study, but it was felt inappropriate to remove items based upon results from such as small sample size. There is clearly a need for the psychometric properties of the two measures to be evaluated with a larger sample size and a different population. One of the challenges to the

psychometric properties of the measures concerns the use of solely positively worded statements. This potentially reduces the validity of the assessments and ideally the measure would have included negative statements, or negatively worded positive statements e.g. I am not unlovable. The difficulty with the inclusion of negatively worded statements concerns the extent to which they measure the same concept. Studies have found (Kendell et al, 1989) positive and negative cognition to be unrelated and consequently the inclusion of negative items may simply have measured a different construct and provided little insight into positive psychological well-being. These issues provide a challenge and further research is needed to examine and improve the psychometric properties of the measures.

One of the difficulties of the study was overlap between the different measures. None of the measures were precision instruments and consequently it is likely that there was overlap between the different independent variables. The level of co-linearity did not challenge the validity of the regression analyses, but there was overlap between concepts such as core-beliefs and self-esteem, which might have masked significant findings. There was also some concern regarding the inter-relationship of the self-esteem scale and the PWBS. One of the sub-scales of the PWBS was Self-Acceptance, which was found to be highly correlated with self-esteem. There was a concern that much of the predictive power of the self-esteem scale might be attributable to the similarity of the measures, rather than because it was a powerful predictor of global psychological well-being. However, the self-esteem scale was also found to be a predictor of well-being on the ABS, a measure of well-being that does not overlap in the same way.

The study relied wholly on the use of self-report measures. No objective measures of psychological well-being were taken and consequently factors such as social desirability may have influenced participants' reporting on the measures. The data were anonymous and confidential, but the questionnaires were completed in public places and since they required participants to examine their beliefs concerning themselves and their lives they may have been unwilling to provide completely honest answers.

Finally, one of the limitations of the study is that the cross-sectional design does not allow conclusions to be drawn concerning whether psychological well-being is caused by, or attributable to, positive cognitive processes. It is possible to say that the two variables are positively related, but not that one leads to the other. There is a need for the further research using longitudinal, case-control or randomised designs, to further investigate the relationship between positive cognition and psychological well-being.

4.4 THEORETICAL AND CLINICAL IMPLICATIONS

Despite these methodological limitations, the findings of this study have a number of theoretical and clinical implications. Despite considerable advances in understanding what it means to be psychologically well and the factors that predict well-being, research into psychological well-being is characterised by a lack of empirically derived models for the mechanisms by which positive psychological states arise. One of the strengths of research into psychological distress (particularly cognitive theory) has been its preoccupation with devising theoretical models that have a valid, empirically tested basis. The findings of this study provide some support for the idea that a cognitive model of positive psychological functioning may help explain how positive psychological states arise and are maintained. The findings implicate positive cognitive processes as potential

contributing factors to positive psychological well-being. This is potentially of great importance. There is a considerable theoretical base that has attempted to understand how cognitive constructs lead to adverse psychological states and this body of knowledge could also, it seems, be usefully applied to understand how positive psychological states arise. For example, this knowledge could be applied at the level of positive automatic thoughts, where it might be found that these effect emotion and behaviour in the same way as negative automatic thoughts; or at a deeper level, where theories about how core-beliefs have developed and are maintained could be applied (e.g. due to early developmental processes (Young, 1990). There is also a need for further research to investigate whether the specific findings of this study have validity. For example, it may prove profitable to employ some of the rigorous experimental methods used in cognitive theory research, to further investigate the cognitive basis underpinning psychological well-being.

Research into psychological distress is characterised by a lack of attention to positive psychological functioning or human strengths (Seligman, 2001). The results provide support for the hypothesis that positive cognitive processes exist, that they can be elicited and measured, and that they are related to positive psychological states. Cognitive theory at present does not explicitly address the role of positive cognition and it is possible that these constructs have explanatory power in understanding the mechanisms and aetiology of psychological disorders as well as positive psychological states. This might in turn have implications for their treatment. Evidence for this comes from the work of Schwartz and Garamoni (1989) and Kendall et al (1989) who have found the balance between positive and negative cognition (at the automatic thoughts level) to be important in psychological disorders. However, there has been little focus

on the importance of positive core-beliefs and assumptions and their role in the aetiology and maintenance of psychological disorders and it may be beneficial to explore their role. The current findings provide no insight into the relationship between positive and negative cognitive constructs, or whether positive cognition plays any role in psychological disorders, but they do suggest that it might be useful to undertake research to investigate this area.

Treatments for psychological disorders have largely neglected to address the issue of positive functioning. Fava (1999) has developed a treatment which aims to explicitly enhance positive functioning and there is evidence for its efficacy (Fava et al, 1998a) in increasing positive functioning (and decreasing psychological distress). The findings of this study suggest that positive cognitions may play a role in the aetiology of positive psychological functioning and consequently, it may be appropriate to design therapeutic interventions, which aim to explicitly address the role of positive cognition. This may help clients attain positive psychological states as well as ameliorate more dysfunctional ways of coping (or, for example, provide protection against future disorder or relapse). If treatments were devised and found to be effective, individuals in psychological distress may benefit from interventions aimed at enhancing positive states in the acute stage of treatment. Fava et al (1998) for example, found well-being therapy to be effective in the treatment of residual symptoms for mixed anxiety and depression and suggests that it may also be effective in the prevention of relapse. Seligman (2000) argues that the future for the prevention of psychological disorders lies in the creation of a science of strengths (e.g. courage, optimism etc.), the attributes of which will act to protect individuals against mental illness and other adversities. It is acknowledged however, that these implications are not based on the direct results of this study.

Finally, this research has an implication for the wider "normal" population. If it is possible to understand what positive psychological functioning is, and the mechanisms by which one can obtain it, individuals will be able to strive for higher positive states and psychological functioning, rather than seeing health (as it is often presented) solely as the absence of illness.

4.5 IMPLICATIONS FOR FUTURE RESEARCH

There are a number of implications for future research that arise from this study. Most importantly there is a need to replicate the findings in a non-student, adult population, with more equal representation of genders. There is a need to undertake further analyses of the two measures constructed, to substantiate their validity and reliability. The measures might also benefit from analyses to shorten them, which may in turn, improve their psychometric properties. This may be particularly true of the PAQ, where there have also been issues raised concerning validity of the underlying theory. There is a need for further developments in cognitive theory to address the issue of assumptions (both positive and negative) and how they relate to other cognitive measures and psychological well-being.

There is a need for research to further investigate the relationship between positive cognition and psychological well-being and specifically, to conduct studies to address the theoretical and clinical implications issues highlighted in this discussion. It would be interesting to;

- undertake rigorous empirical (experimental) studies to test the proposed positive cognitive model.

- examine whether cognition underpins psychological well-being in exactly the same way as it does in psychological disorders.
- compare the incidence and inter-relationship of positive and negative cognition for individuals with psychological disorders and the normal population.
- examine individuals with very high levels of positive psychological well-being, to investigate whether this is underpinned by high levels of positive cognition.

It would also be interesting to examine whether psychological interventions (which may be specifically symptom-focused) bring about a change in positive cognitive constructs, that at present are not explicitly noticed or evaluated. Seligman (2001) suggests that therapy contains many positive psychological processes that go unacknowledged and unstudied. He proposes that therapeutic strategies such as building trust and instilling hope are actually enhancing positive functioning but that these are often labelled as "non-specific" effects of treatment. It is possible that therapeutic interventions exert an effect through positive functions (perhaps mediated by positive cognition), and go unnoticed because they are currently not measured. It may also be of interest to evaluate whether therapeutic interventions can be adapted to address positive cognition explicitly (e.g. as Fava), and whether they are subsequently efficacious in altering positive cognition, and reducing psychological distress. The development of psychometrically robust measures will also facilitate these investigations. Finally, there is need for Ryff's measures of psychological well-being to be validated in a UK population.

4.6 CONCLUSIONS

The study provides some evidence for the existence of positive cognitive processes that can be reliably and validly measured. There is also evidence that they may relate to

psychological well-being. There is a need for further research to investigate the psychometric properties of the two positive cognition measures. The study has highlighted a number of theoretical and clinical implications, which need further investigation. However, overall, it seems that positive cognitive processes, particularly positive core-beliefs, are important predictors of psychological well-being.

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6. APPENDICES

APPENDIX 1: MEASURES

1. The Positive Core-Beliefs Questionnaire
2. The Positive Assumptions Questionnaire
3. The Positive Automatic Thoughts Questionnaire
4. The Psychological Well-Being Scales
5. The Affect Balance Scale
6. The General Health Questionnaire
7. The Self-Esteem Scale
8. The Life Events Scale
9. The General Self-Efficacy Scale
10. The Eysenck Personality Questionnaire – Extraversion
11. The Social Support Survey

THE POSITIVE CORE-BELIEFS QUESTIONNAIRE (PCBQ)

Instructions: Listed below are different attitudes or beliefs which people sometimes hold. Please read each statement carefully and decide how much you agree or disagree with the statement. Base your answer on what you emotionally believe or feel, not on what you rationally believe to be true. Choose the rating which best describes what you usually believe or what you believe most of the time, rather than how you feel right now. Write the number in the box after the statement.

Rating Scale: 0 10 20 30 40 50 60 70 80 90 100

I do not believe this thought at all

I am completely convinced that this thought is true

Statement	Rating
I am a strong person	
I am lovable	
I am competent	
I am resilient	
I am likeable	
I have value as a person	
I am an achiever	
I have a role	
I am interesting	
I have something to contribute	
I am important	
I am successful	
I am an independent person	
I am a capable person	
I fit into a group	
I am ambitious	
I am in control of my life	
I am adventurous	
I am lucky	
I am a good person	
I am optimistic	
I am confident	
I am a responsible person	
I am a friendly person	
I am trustworthy	
I am a sociable person	
I am a fun person	

THE POSITIVE ASSUMPTIONS QUESTIONNAIRE (PAQ)

Instructions: Listed below are different attitudes or beliefs which people sometimes hold. Please read each statement carefully and decide how much you agree or disagree with the statement. Base your answer on what you emotionally believe or feel, not on what you rationally believe to be true. Choose the rating which best describes what you usually believe or what you believe most of the time, rather than how you feel right now. Write the number in the box after the statement. Don't spend too long thinking about each question, how you feel on first reading the question is fine.

Rating Scale: 0 10 20 30 40 50 60 70 80 90 100

I do not believe this thought at all ⟷ I am completely convinced this thought is true

Statement	Rating
If I am respected it means that I have value as a person	
If people care about me it means I am lovable	
If I have a good sense of humour it means I am a fun person	
If I look forward to the future it means I am optimistic	
If I do well it means I am successful	
If I complete something it means I am achieving	
If I stand my ground it means I am a strong person	
If I am able to do something by myself it means I am independent	
If I get on well with people it means I am likeable	
If I try hard at something it means I am persistent	
If my life is running smoothly it means I am in control	
If a friend asks me to do something it means I have a role	
If I bounce back after a set back it means I am resilient	
If I have a partner it means I am lovable	
If I can do something for someone it means I am useful	
If people want to talk to me it means I am interesting	
If I share others' interests it means I fit in well	
If I do a job well it means I am competent	
If I do something for others it means I am a good person	
If I have friends it means I am a sociable person	
If I am good company it means I am fun	
If I look after people it means I am responsible	
If people choose to spend time with me it means that I am likeable	

THE POSITIVE AUTOMATIC THOUGHTS QUESTIONNAIRE

Below is a list of thoughts people might have. Please could you rate how frequently each thought or a similar thought has occurred to you in the past week by place an "X" in the appropriate box;

Items	not at all	sometimes	moderately often	often	all the time
I am respected by my peers					
I have a good sense of humour					
My future looks bright					
I will be successful					
I'm fun to be with					
I am in a great mood					
There are many people who care about me					
I'm proud of my accomplishments					
I will finish what I start					
I have many good qualities					
I am comfortable with life					
I have a good way with others					
I am a lucky person					
I have friends who support me					
Life is exciting					
I enjoy a challenge					
My social life is terrific					
There's nothing to worry about					
I'm so relaxed					
My life is running smoothly					
I'm happy with the way I look					
I take good care of myself					
I deserve the best in life					
Bad days are rare					
I have many useful qualities					
There is no problem that is hopeless					
I won't give up					
I state my opinions with confidence.					
My life keeps getting better					
Today I've accomplished a lot					

PSYCHOLOGICAL WELL-BEING SCALES

The following set of questions deals with how you feel about yourself and your life. Please remember that there are no right or wrong answers. **Please place an "X" in the box that best describes your present agreement or disagreement with each statement.**

STATEMENTS	Strongly Disagree	Disagree Somewhat	Disagree Slightly	Agree Slightly	Agree Somewhat	Strongly Agree
Most people see me as loving and affectionate						
In general, I feel I am in charge of the situation in which I live						
I am not interested in activities that will expand my horizons						
When I look at the story of my life, I am pleased with how things have turned out						
Maintaining close relationships has been difficult and frustrating for me						
I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people						
The demands of everyday life often get me down						
I live life one day at a time and don't really think about the future						
In general, I feel confident and positive about myself						
I often feel lonely because I have few close friends with whom to share my concerns						
My decisions are not usually influenced by what everyone else is doing						
I do not fit very well with the people and the community around me						
I tend to focus on the present, because the future nearly always brings me problems						
I feel like many of the people I know have gotten more out of life than I have						
I enjoy personal and mutual conversations with family members or friends						
I tend to worry about what other people think of me						
I am quite good at managing the many responsibilities of my daily life						
I don't want to try new ways of doing things - my life is fine the way it is						
Being happy with myself is more important to me than having others approve of me						
I often feel overwhelmed by my responsibilities						

STATEMENTS	Strongly Disagree	Disagree Somewhat	Disagree Slightly	Agree Slightly	Agree Somewhat	Strongly Agree
I think it is important to have new experiences that challenge how you think about yourself and the world						
My daily activities often seem trivial and unimportant to me						
I like most aspects of my personality						
I don't have many people who want to listen when I need to talk						
I tend to be influenced by people with strong opinions						
When I think about it, I haven't really improved much as a person over the years						
I don't have a good sense of what it is I'm trying to accomplish in life						
I made some mistakes in the past, but I feel that all in all everything has worked out for the best						
I generally do a good job of taking care of my personal finances and affairs						
I used to set goals for myself, but that now seems like a waste of time						
In many ways, I feel disappointed about my achievements in life						
It seems to me that most other people have more friends than I do						
I enjoy making plans for the future and working to make them a reality						
People would describe me as a giving person, willing to share my time with others						
I have confidence in my opinions, even if they are contrary to the general consensus						
I am good at juggling my time so that I can fit everything in that needs to be done						
I have a sense that I have developed a lot as a person over time						
I am an active person in carrying out the plans I set for myself						
I have not experienced many warm and trusting relationships with others						
It's difficult for me to voice my own opinions on controversial matters						
I do not enjoy being in new situations that require me to change my old familiar ways of doing things						
Some people wander aimlessly through life, but I am not one of them						

STATEMENTS	Strongly Disagree	Disagree Somewhat	Disagree Slightly	Agree Slightly	Agree Somewhat	Strongly Agree
My attitude about myself is probably not as positive as most people feel about themselves						
I often change my mind about decisions if my friends or family disagree						
For me, life has been a continuous process of learning, changing, and growth						
I sometimes feel as if I've done all there is to do in life						
I know that I can trust my friends, and they know they can trust me						
The past had its ups and downs, but in general, I wouldn't want to change it						
I have difficulty arranging my life in a way that is satisfying to me						
I gave up trying to make big improvements or changes in my life a long time ago						
When I compare myself to friends and acquaintances, it makes me feel good about who I am						
I judge myself by what I think is important, not by the values of what others think is important						
I have been able to build a home and a lifestyle for myself that is much to my liking						
There is truth to the saying that you can't teach an old dog new tricks						

THE AFFECT BALANCE SCALE

We are interested in the way people are feeling these days. During the past few weeks, did you ever feel...

Please tick the YES or NO box, following each description

	Yes	No
Particularly excited or interested in something?		
So restless that you couldn't sit long in a chair?		
Proud because someone complimented you on something you had done		
Very lonely or remote from other people?		
Pleased about having accomplished something?		
Bored?		
On top of the world?		
Depressed or very unhappy?		
That things were going your way?		
Upset because someone criticized you?		

THE GENERAL HEALTH QUESTIONNAIRE

Please read this carefully:

We would like to know if you have had any medical complaints, and how your health has been in general, *over the past few weeks.* Please answer ALL the questions on the following pages simply by circling the answer which you think most nearly applies to you. Remember that we want to know about present and recent complaints, not those that you had in the past.

Have you recently:

Been able to concentrate on whatever you're doing	Better than usual	Same as usual	Worse than usual	Much worse than usual
Lost much sleep over worry	Not at all	No more than usual	Rather more than usual	Much more than usual
Felt that you were playing a useful part in things	More so than usual	Same as usual	Less useful than usual	Much less useful
Felt capable of making decisions about things	More so than usual	Same as usual	Less so than usual	Much less capable
Felt constantly under strain	Not at all	No more than usual	Rather more than usual	Much more than usual
Felt you couldn't overcome your difficulties	Not at all	No more than usual	Rather more than usual	Much more than usual
Been able to enjoy you normal day-to-day activities	More so than usual	Same as usual	Less so than usual	Much less than usual
Been able to face up to your problems	More so than usual	Same as usual	Less able than usual	Much less able
Been feeling unhappy and depressed	Not at all	No more than usual	Rather more than usual	Much more than usual
Been losing confidence in yourself	Not at all	No more than usual	Rather more than usual	Much more than usual
Been thinking of yourself as a worthless person	Not at all	No more than usual	Rather more than usual	Much more than usual
Been feeling reasonably happy, all things considered	More so than usual	About same as usual	Less so than usual	Much less than usual

THE SELF-ESTEEM SCALE

Please place an "X" in the column which you think most nearly applies to you;

	Strongly agree	Agree	Disagree	Strongly Disagree
On the whole I am satisfied with myself				
At times I think that I am no good at all				
I feel that I have a number of good qualities				
I am able to do things as well as most people				
I feel I do not have much to be proud of				
I feel useless at times				
I feel that I am a person of worth, at least on an equal plane with others				
I wish I could have more respect for myself				
All in all, I am inclined to feel that I am a failure				
I take a positive attitude towards myself				

THE LIFE EVENTS SCALE

In the past 12 months, which of these have happened to you? (please place an X in the YES or No column)

Life Event	Yes	No		Life Event	Yes	No
Death of spouse				Change in responsibilities at work		
Divorce				Son or daughter leaving home		
Marital separation				Trouble with in-laws		
Jail term				Outstanding personal achievement		
Death of close family member				Partner starts or stops working		
Personal injury or illness				Change in living conditions		
Marriage				Revision of personal habits		
Fired at work				Trouble with boss		
Marital reconciliation				Change in work hours or conditions		
Retirement				Change in residence		
Change in health of family member				Change in schools		
Pregnancy				Change in recreation		
Sex difficulties				Change in religious activities		
Gain in new family member				Change in social activities		
Business readjustment				Mortgage or loan less than £7,000		
Change in financial state				Change in sleeping habits		
Death of close friend				Change in number of family gatherings		
Change to a different line of work				Change in eating habits		
Change in number of arguments with partner				Holiday		
Mortgage or loan over £7,000				Festive season		
Foreclosure of mortgage or loan				Minor violation of the law		

THE GENERAL SELF-EFFICACY SCALE

Please place an "X" in the column which you think most nearly applies to you

	Not at all true	Hardly true	Moderately true	Exactly true
I can always manage to solve difficult problems if I try hard enough				
If someone opposes me, I can find the means and ways to get what I want.				
It is easy for me to stick to my aims and accomplish my goals.				
I am confident that I could deal efficiently with unexpected events.				
Thanks to my resourcefulness, I know how to handle unforeseen situations.				
I can solve most problems if I invest the necessary effort.				
I can remain calm when facing difficulties because I can rely on my coping abilities.				
When I am confronted with a problem, I can usually find several solutions.				
If I am in trouble, I can usually think of a solution.				
I can usually handle whatever comes my way.				

EYSENCK PERSONALITY QUESTIONNAIRE - EXTRAVERSION

INSTRUCTIONS: Please answer each question by placing an "X" in either "YES" or "NO" following each question. There are no right or wrong answers, and no trick questions. Work quickly and do not think too long about the exact meaning of the questions.

		YES	NO
1	Do you have many different hobbies?		
2	Are you a talkative person?		
3	Are you rather lively?		
4	Can you usually let yourself go and enjoy yourself at a lively party?		
5	Do you enjoy meeting new people?		
6	Do you tend to keep in the background on social occasions?		
7	Do you like going out a lot?		
8	Do you prefer reading to meeting people?		
9	Do you have many friends?		
10	Would you call yourself happy-go-lucky?		
11	Do you usually take the initiative in making new friends?		
12	Are you mostly quiet when you are with other people?		
13	Can you easily get some life into a rather dull party?		
14	Do you like telling jokes and funny stories to your friends?		
15	Do you like mixing with people?		
16	Have people said that you sometimes act too rashly?		
17	Do you nearly always have a ready answer when people talk to you?		
18	Do you like doing things in which you have to act quickly?		
19	Do you often make decisions on the spur of the moment?		
20	Do you often take on more activities than you have time for?		
21	Can you get a party going?		
22	Do you like plenty of bustle and excitement around you?		
23	Do other people think of you as being very lively?		

SOCIAL SUPPORT SURVEY

People sometimes look to others for companionship, assistance, or other types of support. How often is each of the following kinds of support available to you if you need it? Circle one number on each line.

	None of the time	A little of the time	Some of the time	Most of the time	All of the time
Someone you can count on to listen to you when you need to talk	1	2	3	4	5
Someone to give you information to help you understand a situation	1	2	3	4	5
Someone to give you good advice about a crisis	1	2	3	4	5
Someone to confide in or talk to about yourself or your problems	1	2	3	4	5
Some whose advice you really want	1	2	3	4	5
Someone to share your most private worries and fears with	1	2	3	4	5
Someone to turn to for suggestions about how to deal with a personal problem	1	2	3	4	5
Someone who understands your problems	1	2	3	4	5
Someone to help you if you were confined to bed	1	2	3	4	5
Someone to take you to the doctor if you needed it	1	2	3	4	5
Someone to prepare your meals if you were unable to do it yourself	1	2	3	4	5
Someone to help with daily chores if you were sick	1	2	3	4	5
Someone who shows you love and affection	1	2	3	4	5
Someone to love you and make you feel wanted	1	2	3	4	5
Someone who hugs you	1	2	3	4	5
Someone to have a good time with	1	2	3	4	5
Someone to get together with for relaxation	1	2	3	4	5
Someone to do something enjoyable with	1	2	3	4	5
Someone to do things with to help you get your mind off things	1	2	3	4	5

Appendix 2: INFORMATION SHEET

PLEASE TEAR OFFAND KEEP

INFORMATION SHEET

Study Title

An investigation into how people think and feel when they feel well

Introduction

You are being invited to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with friends and relatives if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.

What is the purpose of the study?

You have been invited to take part in a study trying to investigate how people feel when they feel psychologically well. The study aims to investigate how people feel about themselves and their lives and to investigate the things they feel are important in making them feel happy and well.

Why have you been chosen?

Students at Brookes University have been approached to see if they agree to volunteer to take part in the study. You have not been specifically chosen.

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you would be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason.

What would happen to me if I take part?

If you agree to take part you would be asked to complete a number of questionnaires that ask you questions about how you think and feel about yourself and your life.

Would my taking part in this study be kept confidential?

Questionnaire are completed anonymously and all information which is collected during the course of the research would be kept strictly confidential.

What would happen to the results of the research study?

The results of the study will be written up in the form a thesis and the intention if to also produce academic papers.

Who is organising and funding the research?

The study is not funded, and is being carried out a part of the research requirements of the Oxford Doctoral Course in Clinical Psychology.

Who has reviewed the study?

This study has been reviewed by the Oxfordshire Research Ethics Committee and Brookes University Ethics Committee.

Contact for Further Information

FOR MORE DETAILS OR IF YOU HAVE ANY FURTHER QUESTIONS PLEASE PHONE RUPERT on ……..

THANK YOU FOR AGREEING TO PARTICIPATE IN THE STUDY

Appendix 3: Letter of Ethical Approval

Oxford Radcliffe Hospitals NHS
NHS Trust

RJ/Imp:O01.024

Oxfordshire Psychiatric Research Ethics Committee
Research & Development Department
Room 13, Manor House
The John Radcliffe
Headley Way
Headington
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Tel: 01865 222692
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Email: Orla.Bickers@orh.nhs.uk

Dr Myra Cooper
Isis Education Centre
Warneford Hospital
Warneford Lane
HEADINGTON
OXFORD
OX3 7JX

Dear Myra

7 June 2001

Re: O01.024 – The importance of cognitive processes in positive psychological well-being.

Thank you for submitting your research application which was considered by the Oxfordshire Psychiatric Research Ethics Committee (OPREC) at its meeting on Friday, 5 June 2001, as you know. I am pleased to tell you that it was approved without the need for amendments or clarification.

Please note:

- Ethical approval is valid for three years from the date of this letter. Annual updates of the progress of the research and a report of the outcome are required. (A reminder letter will be sent when these reports are due).

- No significant changes to the research protocol should be made without appropriate research ethics committee/chairman's approval. Any deviations from or changes to the protocol which increase the risk to subjects, or affect the conduct of the research, or are made to eliminate hazards to the research subjects, should be made known to OPREC.

- OPREC should be made aware of any adverse events.

- Whilst the study has received approval on ethical grounds, it is necessary for you to obtain management approval from the relevant Clinical Directors and/or Chief Executive of the Trusts (or Health Boards/DHAs) in which the work will be done.

I should be very grateful if you could send me a copy of any publication which may arise from this study.

NB: Any research which will be conducted on NHS patients or staff, and which has been approved by a research ethics committee must carry the appropriate indemnity. May I remind you that OPREC final approval is contingent on the appropriate indemnity being in place.

With very best wishes

Yours sincerely,

Professor Robin Jacoby
Chairman
Oxfordshire Psychiatric Research Ethics Committee

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22 October 2001

Rupert Noad
ISIS Education Centre
Warneford Hospital
London Road
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Dear Mr Noad

UREC A01/02
The importance of cognitive processes in positive psychological well-being

Thank you for your letter of October 16th, providing further information on the points raised in my letter of September 28th.

I am pleased to say that your responses meet our concerns and that, on behalf of the University Research Ethics Committee, I can give approval to proceed with recruiting participants to the study at Oxford Brookes University.

Yours sincerely

Mary Boulton

Mary Boulton, PhD
Chair, University Research Ethics Committee

Cc Dr Dick Craven
Dr Chris Mcleod
Dr Julie Wintrup
Ms Jill Organ

Appendix 4: Calculation of estimated response rate

School	Sub-sample	Estimated size of class	Number packs returned	Estimated response rate
Psychology	Psychology I	70	39	56
	Psychology II	17	17	100
	Psychology III	14	9	64
Law		103	66	64
Geography		65	55	85
Biological Sciences	Cell Chemistry	42	28	66
	Physiology	14	10	71

An estimate of the response rate was calculated by averaging the response rates for the four different faculties. This was calculated to be 72%.