

# **Subjective Wellbeing: An Assessment of Competing Theories**

By

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Submitted in fulfilment of the requirements for the degree of

Doctor of Philosophy

Deakin University

June 2008

I certify that the thesis entitled: Subjective Wellbeing: An Assessment of Competing Theories

submitted for the degree of: Doctor of Philosophy

is the result of my own work and that where reference is made to the work of others, due acknowledgment is given.

I also certify that any material in the thesis which has been accepted for a degree or diploma by any university or institution is identified in the text.

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## Acknowledgements

First and foremost I would like to thank my supervisor, Professor Mark Stokes. Mark, through your supervision you provided me the challenges and stimulation I needed and desired for intellectual growth. For this I am incredibly grateful. The value of your guidance, both professional and personal, is incalculable. Also to my mum, Angela, thank you; not only for your sacrifices that have helped bring me to this point, but also for your love and support. To my dad, Graeme, your encouragement and belief in my abilities helped keep me going when the motivation fell. Thank you for your love and support. To my brother John and my sister Rosa, thank you for your love, care, friendship, and understanding. Thanks also to my extended family for your encouragement and love. To my fellow Deakin “dungeon” crew, thanks for your friendship; especially to my fellow PhD’s, Ardy, Johann, and Matt. I have no doubt the friendships we have forged will last a lifetime. A special thanks also go to my best friend, Caline. We’ve had an incredible relationship over the past few years; I sincerely appreciate and value the care and support you have given me. Thanks also to my close mate John and the rest of “team globe”, our bodyboarding adventures helped keep me sane throughout this thesis. To the other Tomyrn brothers, Justin and Luke, thanks for your fantastic friendship. To Greg, Claire, Rob, and Terry, you’re incredible generosity helped build a space for me to study and live, without which this thesis would have been a little more difficult to say the least. Also thanks to Frank O’Dea whose encouragement and support was invaluable in the latter years of my high school education. Lastly, to my grandad Ernie, you pulled through and I owe you a completed thesis. Here it is.

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## GLOSSARY

%SM: percentage of scale maximum

AIC: Akaike's Information Criterion

AGFI: Adjusted Goodness of Fit Index

ANEW: Affective Norms for English Words

AUWBI 8: Eighth survey of the Australian Unity Wellbeing Index

BDI: Beck Depression Inventory

BAWLC: Balanced Affective Word List Creation

CFI: Comparative Fit Index

DASS: Depression, Anxiety, and Stress Scale

Df: Degrees freedom

DV: Dependent Variable

ESM: Experience Sampling Methodology

FDR: False Discovery Rate procedure

GDP: Gross Domestic Product

GNP: Gross National Product

GT: Global Trait measurement

L-AUWBI 5: Fifth longitudinal survey of the Australian Unity Wellbeing Index

L-AUWBI 6: Sixth longitudinal survey of the Australian Unity Wellbeing Index

L-AUWBI 7: Seventh longitudinal survey of the Australian Unity Wellbeing Index

LDT: Lexical Decision Task

LOT-R: Life Orientation Test – Revised

LS: Life Satisfaction

M: Mean

MDT: Multiple Discrepancies Theory

MLM: Multi-Level Model(ling)

MR: Multiple Regression

MS: Mean State measurement

ms: Milliseconds

NA: Negative Affect

NEO-PI-R: NEO Personality Inventory, Revised

NFI: Normed Fit Index

NoP: No Priming



NP: Negative Priming

NvN: Negative versus Neutral task

P-A: Pleasant-activated affect

PA: Positive Affect

PACA: Pleasant-activated Core Affect

PANAS: Positive and Negative Affect Schedule

PDA: Personal Data Assistant

PLS: Plain Language Statement

PMAT: Purdue Momentary Assessment Tool

PP: Positive Priming

PvN: Positive versus Neutral task

PWI: Personal Wellbeing Index

QOL: Quality of Life

R: Recalled measurement

ResNvN: Residualised Reaction Time for Negative versus Neutral Task

ResPvN: Residualised Reaction Time for Positive versus Neutral Task

RMSEA: Root Mean Squared Error of Approximation

RSE: Rosenberg Self-Esteem scale

RT: Reaction Time

SD: Standard Deviation

SEM: Structural Equation Model(ling)

SMC: Squared Multiple Correlation

SWB: Subjective Wellbeing

SWLS: Satisfaction with Life Scale

TIPI: Ten Item Personality Inventory

VIT: Valence Identification Task

## ABSTRACT

This thesis set out to develop, examine, and test differing theoretical models of Subjective Wellbeing (SWB). SWB is the subjective evaluation of an individual's satisfaction with life. Early research into SWB found objective conditions, such as age, education, and gender, were only weakly related to SWB. As such, researchers proposed dispositional tendencies to explain the large amount of unaccounted variance in SWB. This led to the proposal that two of the major dimensions of personality, extroversion and neuroticism, were strongly related to SWB. However an analysis of this research suggested that extroversion and neuroticism typically accounted for only a small amount of variance in SWB. Thus, researchers examined other variables that might explain more variance in SWB. Such variables included self-esteem, perceived control, and optimism, which were all found to relate moderately with SWB. These three variables, along with extroversion and neuroticism, were then incorporated into a theoretical model of SWB developed by Cummins, Gullone, and Lau (2002). This model was developed based on research by Cummins (1995, 1998) who found life satisfaction to be maintained within a narrow positive range despite a diversity of samples and methodologies. In this theoretical model, it was proposed that SWB is maintained homeostatically around an individual set-point through the operation of personality in conjunction with the variables self-esteem, perceived control, and optimism. However direct empirical support for this model was lacking. Accordingly Study 1 was conducted to directly test this homeostatic model of SWB with other, empirically supported models. These models were Multiple Discrepancies Theory (MDT; Michalos, 1985) and an affective-cognitive model of SWB (Davern, 2004). MDT proposes that SWB is the direct result of a series of perceived gaps in relation to

an individual's life circumstances. In contrast, the affective-cognitive model proposes SWB is driven largely by trait affect in conjunction with MDT and personality.

Results of Study 1 did not support any of the three theoretical models. However, support was found for an affective model of SWB in which Pleasant-Activated Core Affect (PACA) was the sole predictor of SWB. Study 2 replicated these results in three independent samples. In Study 3, a Reaction Time (RT) paradigm was used to examine whether individual differences in affective processing correlated with SWB. Participants completed a valence identification task, in which RTs to correctly identify the valence of positive versus neutral, and negative versus neutral words, was measured. Individual differences in affective processing was found to significantly influence RT. Individuals high on positive affect performed worse than individuals low on positive affect. In conjunction with the RT task, individuals also completed self-report measures of SWB and trait affect. As in Studies 1 and 2, the trait PACA model of SWB provided an excellent explanation of the data. However, conclusions regarding the efficacy of this model could not be conclusively drawn, as the results from Studies 1, 2, and 3 were all based on retrospective self-reports of affect and SWB. This is problematic as research has demonstrated that such reports are subject to memory distortions and judgmental biases. Accordingly, Study 4 was conducted using a different methodology to determine the efficacy of the trait PACA model. This methodology is termed Experience Sampling Methodology (ESM). In this ESM study, participants reported on momentary affect and SWB at random intervals throughout the day for 14 days, on a personal data assistant (PDA). ESM effectively solves the problems associated with retrospective self-reports as the time lag between the signal and the response is minimal. ESM is also ecologically valid as data are collected within the context of an individual's daily life. Using

multi-level modelling and structural equation modelling, results again supported the utility of the PACA model of SWB. This result, in conjunction with the results from Studies 1, 2, and 3, strongly suggests that an affective model of SWB with trait PACA as the sole determinant of SWB provides an efficacious and parsimonious explanation of subjective judgments of life satisfaction.

## CHAPTER 1: SUBJECTIVE WELLBEING CHARACTERISTICS

### 1. Introduction

The quest for happiness is fundamental to human beings. It is a state that most people strive to achieve. Most of us can report, at least at some stage of our lives, being happy. The meaning of happiness has evolved over time; our current conceptualisations are not the same as those posited by early Greek philosophers. The basic correlate of happiness in Aristotle's time was referred to as *eudaemonia*, which roughly translates into the highest good, a state that is not pursued for its own ends, but rather, gained by leading a virtuous life. This concept of happiness is normative; happiness is judged as a desirable state from an observer's particular value framework (Diener, 1984). However modern Western notions of happiness centre on the individuals subjective experience. Most commonly, the correlate of happiness in today's society is thought to be the maximisation of pleasure and minimisation of pain.

Although the drive towards achieving happiness, whether normative or subjective, is innate to being human, the study of how and why people strive to achieve happiness is only a recent phenomenon that arose from the study and compilation of 'social indicators'. Social indicators were originally conceived of in North America in the 1960s as a response to the need to measure changes in society (Land, 1999). At the time, the typical indices used to measure societal changes were of an economic nature; for example, Gross Domestic Product (GDP) and Gross National Product (GNP). In response to this, a class of indicator was developed that purported to measure an individual's subjective satisfaction with life, which included overall happiness, and

happiness or satisfaction with various life domains (such as work, family, etc.). Subsequently, empirical research began to emerge that examined individual differences in satisfaction scores (Andrews & Withey, 1976; Campbell, Converse, & Rodgers, 1976). Following these early studies, empirical research has grown exponentially and given rise to the birth of a new field, that of 'Quality of Life' research.

Contributing to this growth in research was the move in psychology away from a strict focus on illbeing, towards a broader focus incorporating wellbeing. This followed the realisation that the absence of illbeing did not necessarily entail the presence of wellbeing. This idea is reflected in the World Health Organisations definition of wellbeing, in which wellbeing is characterised by the presence of "complete physical, mental and social wellbeing, and not merely the absence of disease or infirmity" (WHO, 1946, p.1). Psychology was now beginning to ask how and why people felt good, and how this contributed to positive mental health. This question has become the core of research in the quality of life field.

At this point, a taxonomy of definitions is required as research in this field often employs differing terms. Quality of life consists of objective and subjective components. Objective quality of life considers the degree that a life meets norm-referenced standards as judged by an impartial outsider. In contrast, subjective quality of life concerns self-appraisals of an individual's satisfaction with life (Veenhooven, 1999). The relation between objective and subjective quality of life will be discussed further in the following section, however, the remainder of this review will emphasise subjective quality of life research.

The term “subjective quality of life” is also referred to as life satisfaction (LS), and is often used interchangeably with the term Subjective Wellbeing (SWB). Researchers have hypothesised that subjective wellbeing comprises two components of evaluation (Diener, 1984; Pavot, Diener, Colvin, Sandvik, 1991). The first component is a cognitive evaluation of how satisfactory an individual rates their life, either as a whole, or in various domains. The former evaluation is generally denoted the ‘global approach’ and is typically measured via self-report by asking some variant of the question, “How satisfied are you with your life as a whole?”, whilst the latter is thought of as the domain approach and is asked by, “How satisfied are you with domain x?” It is also important to note that scores on each domain are summed to yield an overall satisfaction score. The second component of subjective wellbeing is proposed to be an affective evaluation of one’s life. That is, an evaluation that taps into the long-term affective state (i.e., pleasure and displeasure, or positive and negative affect) of an individual, often measured by self-report questionnaires. Researchers have reported that life satisfaction judgements form a separate factor from affective evaluations of one’s life (Andrews & Withey, 1976; Diener, Suh, Lucas & Smith, 1999).

Diener is a major proponent in the field of subjective wellbeing research and has amassed a large body of SWB research. In 1984, Diener published a major review of the subjective wellbeing literature in which his starting point was to note that a prior review of the field conducted by Wilson in 1967 came to two broad conclusions. Firstly, those who were the happiest were those with the most advantages (i.e., young, well-educated, healthy, etc). Secondly, that since the time of the ancient Greek philosophers, little theoretical progress had been made towards understanding happiness. Diener noted that

since the publication of Wilson's review, little had changed in terms of theoretical progress in the field of subjective wellbeing research.

This review will attempt to address the lack of theoretical progress noted by Diener (1984) by furthering the understanding of subjective wellbeing. This discussion will progress from an identification of the characteristics of SWB; to examining the variables thought to relate to SWB; to finally, critically evaluating theoretical models of SWB that attempt to integrate such variables.

## **2. Characteristics of Subjective Wellbeing**

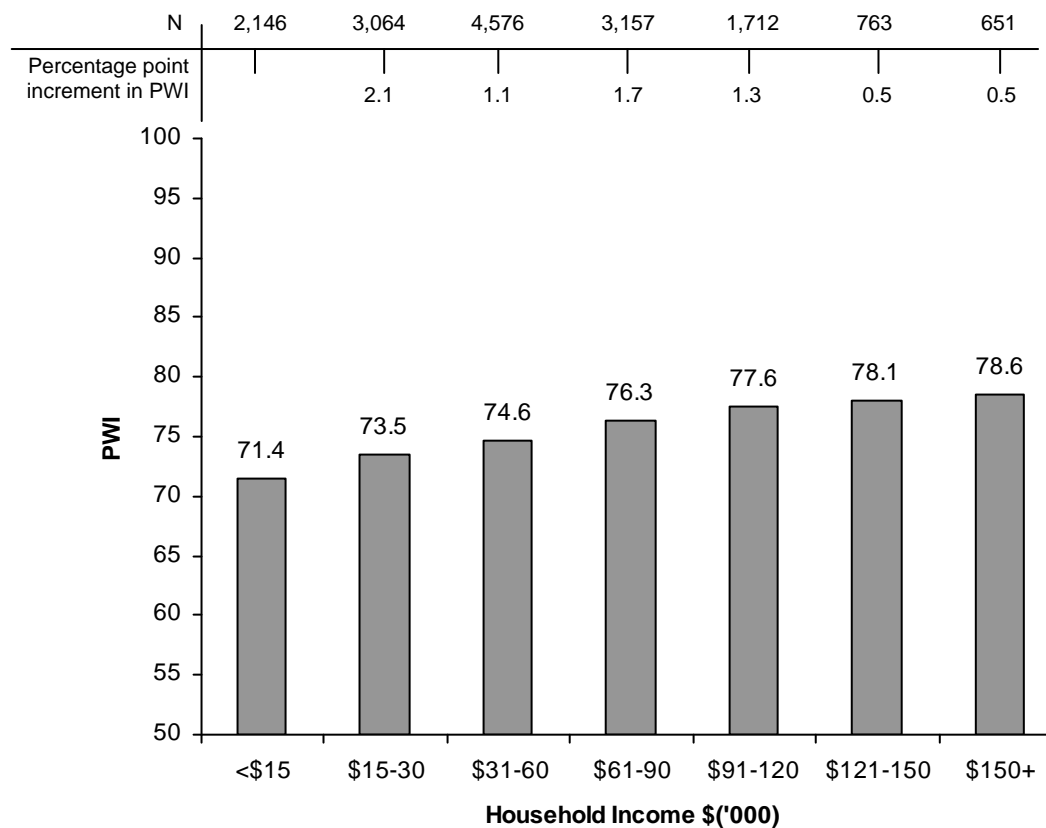
### *2.1 Objective and Subjective Wellbeing*

It is important to firstly identify the parameters of wellbeing research that this review will focus on. While quality of life can be separated into objective and subjective components, the quality of life field often does not distinguish between the two. This is evident in an analysis of the literature by Cummins (1997) in which an overwhelming majority (80%) of the definitions of quality of life referred to both objective and subjective components, whilst a minority referred to the latter only (20%). This mixture of the objective and subjective components of wellbeing leads to confusion and hinders understanding. To clear this confusion and further the understanding of subjective wellbeing, it is necessary to examine the relation between objective and subjective quality of life.



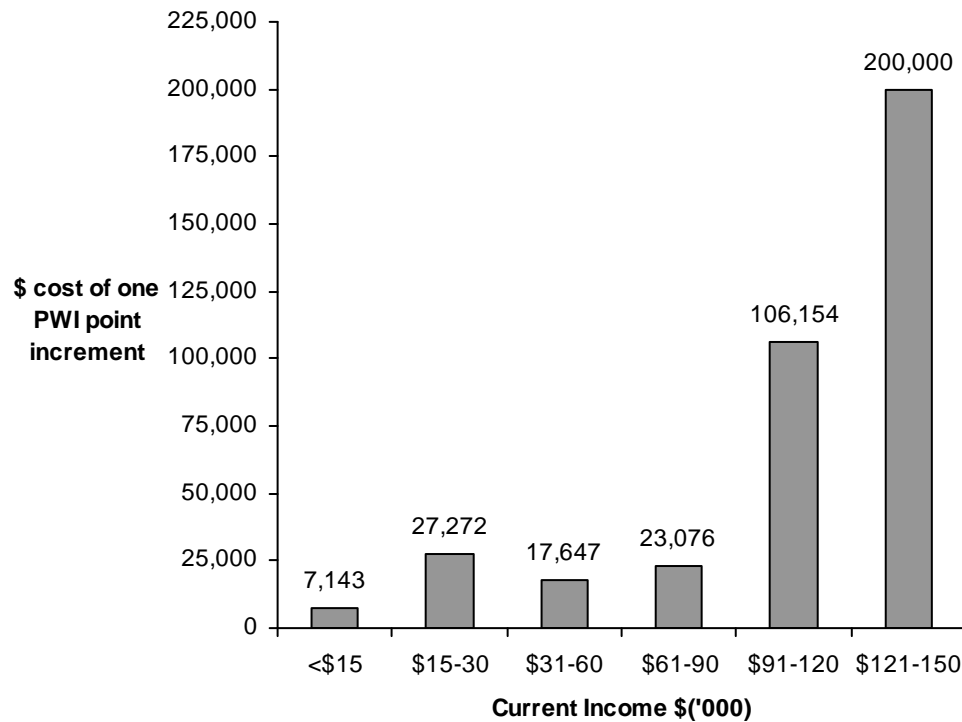
According to Diener (1984), one of the characteristics of subjective wellbeing is its subjectivity. Objective conditions are seen as potential influences, but not as an inherent or necessary part of SWB. The weak relation between objective conditions and subjective wellbeing has been highlighted by a number of studies (Cummins, 1997, 2000; Diener, 1999). In one particular study, Cummins (2000) analysed the relation between objective and subjective quality of life indicators. An evaluation of 10 studies was conducted whereby, within each study, objective indicators were correlated with other objective indicators (i.e., education and income); subjective indicators were correlated with other subjective indicators (i.e., life satisfaction and happiness), and finally, both objective and subjective indicators were correlated (i.e., education and life satisfaction). Cummins found that the average of the objective correlations ( $M=.32$ ,  $SD=.05$ ) and subjective correlations ( $M=.38$ ,  $SD=.15$ ) did not significantly differ, however, both of these average correlations were significantly higher than the average correlation between objective and subjective indicators ( $M=.12$ ,  $SD=.08$ ). This result suggested that objective and subjective quality of life indicators are poorly correlated. However, the relationship between objective and subjective indicators was proposed by Cummins to be non-linear. Specifically, when objective circumstances become detrimental, and the organism's capacity for adaptation is exceeded, objective and subjective indicators would strongly co-vary (Cummins, 2000). This co-variation has been demonstrated by studies that have examined the effect of income on subjective wellbeing. A strong relation exists when levels of income are such that a basic material standard of living cannot be achieved. For instance, in a survey of over 2,000 South Africans, Moller and Dickow (2002) found wealthy South Africans, regardless of race, reported higher life satisfaction than poorer South Africans (also see Graham & Pettinato, 2002 for an analysis of income and SWB in developing countries). However,

Diener and C. Diener (1995) note that once basic standards have been met, the effects of increasing levels of income become marginal. This curvilinear relationship between income and subjective wellbeing is illustrated in a geographically representative survey of 16,069 Australians (Cummins, Woerner, Tomy, Gibson, & Knapp, 2006). In this survey, individuals provided reports on life satisfaction as well as satisfaction with various domains. Together these domains represent the Personal Wellbeing Index (PWI), which was developed as the first level deconstruction of global life satisfaction. Individuals in this survey also provided estimates of annual gross household income, allowing the relation between SWB (as measured by the PWI) and income to be assessed. The results of this analysis are presented in Figure 1.1.



*Figure 1.1: Average household income and the Personal Wellbeing Index. The ordinate reveals mean PWI scores ranging from 50 to 100 whilst the abscissa represents categories of average household income. Figure adapted from “Australian Unity Wellbeing Index: Survey 16” by Cummins et al., 2006, p. 42. Australian Centre on Quality of Life, School of Psychology, Deakin University. Copyright Deakin University and Australian Unity Limited. Adapted with permission.*

The data in Figure 1.1 indicate that beyond the household income category of \$61-90,000, the effects of increased income diminishes. In addition, the amount of money required to raise SWB by one percentage point increases exponentially once household incomes reach \$61-90,000 (for example, an additional \$15,000 for the household income category of \$60-90,000 buys 1.3 percentage points of SWB (76.3 to 77.6); this equates to \$106,154 per point). This relationship is illustrated in Figure 1.2.



*Figure 1.2: The cost of purchasing a percentage point of subjective wellbeing. The ordinate reveals the dollar cost of achieving a one point incremental increase in PWI scores whilst the abscissa represents current household income categories. Figure adapted from “Australian Unity Wellbeing Index: Survey 16” by Cummins et al., 2006, p. 43. Australian Centre on Quality of Life, School of Psychology, Deakin University. Copyright Deakin University and Australian Unity Limited. Adapted with permission.*

In further support of this weak relation between objective and subjective measures of quality of life, economic indicators have, over the past decade, revealed an enormous increase in real standards of material wealth (Easterlin, 1995, 2005). However subjective levels of happiness have remained static (Easterlin, 1995, 2005). Despite this, most Western countries still equate economic progress to increased wellbeing. This is exemplified in a speech delivered to the World Economic Forum in 1998 by the former Prime Minister of Australia, John Howard. “The overriding aim of our agenda is to deliver Australia an annual growth rate of over four per cent on average during the decade to 2010” (Howard, 1998). Mr Howard further cemented an equating of

economic progress with wellbeing in April of 2000, when he stated that, “economic reform is about satisfying human needs. Economic reform is about making people feel more secure, *happier* [emphasis added], more able to care for their families” (Howard, 2000). In contrast to this governmental view, social research has identified that the equating of economic progress and wellbeing is at odds with the majority view of Australians. In a survey of 1,200 Australians, Eckersley (1999) found that 75% of respondents considered spending more time with family and friends was very important to improving personal quality of life. In comparison, only 38% of respondents regarded more money to buy things as very important to improving quality of life.

The constant rise in economic wealth, with no equivalent rise in quality of life, has led some researchers to propose a threshold hypothesis whereby levels of per capita Gross National Product (GNP) are strongly linked to quality of life up to a sufficient point, beyond which any greater rise in economic wealth has zero or negative effects (Max-Neef, 1995). Max-Neef provides observational evidence in support of this hypothesis. The Index of Sustainable Economic Welfare (ISEW), an index that combines social factors, income inequalities and environmental deterioration, was plotted against the per capita GNP for five different countries (United States, United Kingdom, Germany, Austria, and the Netherlands). Max-Neef found that the ISEW runs parallel to per capita GNP for the period between 1950 and the 1970s. However, as per capita GNP continued to rise from the 1970s onwards, in all countries the ISEW not only levels off but also declines sharply. This led the author to speculate that such countries may have approached a point in which quantitative growth must be metamorphosed into qualitative development for progress in quality of life to result. In

other words, economic growth, in and of itself, is not sufficient to produce increases in individuals' or countries' happiness and satisfaction.

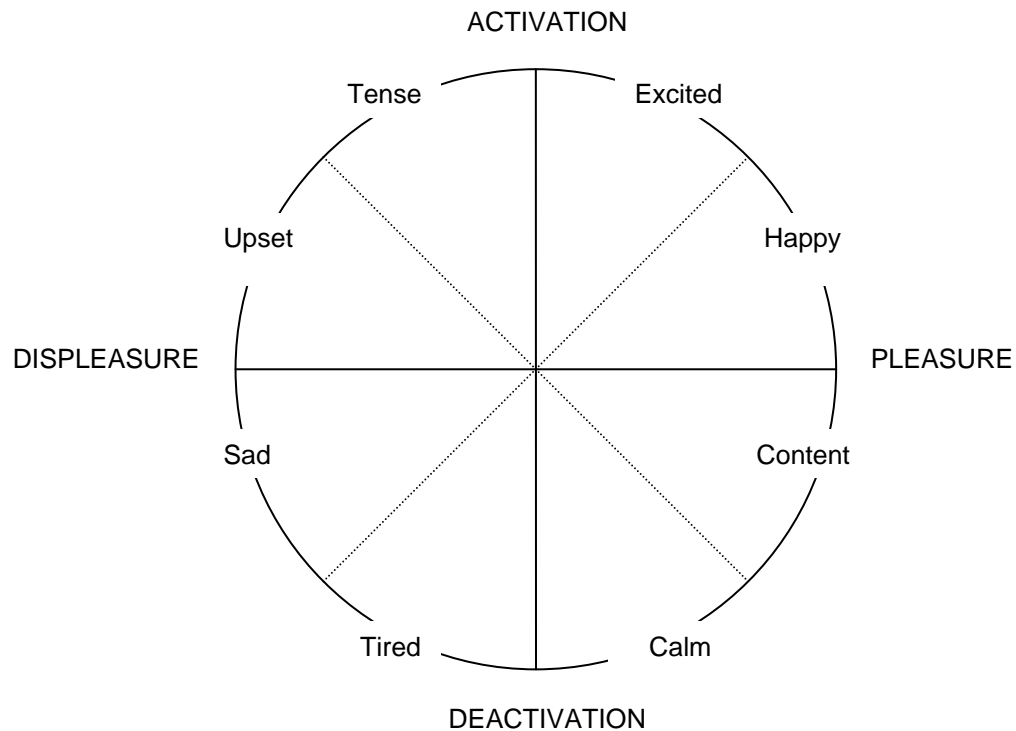
The empirical research reviewed above demonstrates that objective quality of life, best exemplified by economic indicators such as GDP and GNP, is minimally related to subjective experiences of wellbeing. As such, a necessary distinction between objective and subjective quality of life has been proposed by Cummins (1997). As the quality of life literature often employs definitions conflating objective and subjective components, Cummins argues for a consensus on the definition of quality of life based upon three key propositions: (a) quality of life refers to both objective and subjective dimensions of human life, (b) the objective dimension incorporates norm-referenced measures of wellbeing, and (c) the subjective dimension includes measures of perceived wellbeing. Cummins notes that the subjective dimension is often referred to as "Subjective Wellbeing". As such, in this review subjective wellbeing will be considered synonymous with the terms subjective quality of life, and wellbeing.

Based on the discussion of the distinction between objective and subjective quality of life, and the weak relation between the two, the subject of the current review will focus on subjective quality of life.

## *2.2 Affect and Subjective Wellbeing*

As mentioned previously, affect is of central importance to considerations of life satisfaction as it is proposed to comprise a major component of SWB (Diener et al., 1999). Along with research into SWB, affect research often employs differing terms.

Terms such as mood, emotion, valence, and affect are often used interchangeably. Russell (2003) notes that this is problematic, as emotions are qualitatively different from moods and affect. Emotions include a substantial evaluative component, as an emotion is usually directed at, or attached to, an event or object. For instance, an individual, encountering a snake, is afraid *of the snake* (or more precisely, of the snake causing physical harm; Russell, 2003). In comparison, moods are often, although not always, objectless. In a search for the primitive components associated with affect, valence, moods, and emotions, Russell proposed what he termed “Core Affect”. Core affect is the combination of two objectless dimensions of pleasure-displeasure and activation-deactivation, and is the primitive component associated with felt emotion and moods. Specifically core affect is a consciously accessible neurophysiological state comprised of a blend of hedonic and arousal values. It is simple, objectless, universal, and ubiquitous, existing prior to any attribution about its cause. Therefore, core affect is not cognitive or reflective, as cognitive events are intrinsically about something (Russell, 2003). This distinction between emotions and moods is applied throughout this thesis. In addition, moods and affect will be considered synonymous. The structure of Russell’s core affect is presented in Figure 1.3.



*Figure 1.3: Schematic description of Russell's (2003) Core Affect. Adapted from "Core Affect and the Psychological Construction of Emotion" by J.A. Russell, 2003, Psychological Review, 110(1), p. 148. Copyright 2003 by the American Psychological Association, Inc. Adapted with permission.*

The model of core affect given in Figure 1.3 is represented by a circumplex. A circumplex is a model in which constructs can be organised roughly around a ring within a two-dimensional space. The idea of a circumplex to describe affect was first introduced by Wundt (1897) where affect terms were placed around the dimensions of tension-release, pleasant-unpleasantness, and excitement-calm in a sphere. Following this organisation of affect into a circumplex by Wundt, the idea of affect being described by two dimensions has persisted. Typically, researchers have described the first dimension of the unrotated factor solution as hedonic tone (Cropanzano, Weiss, Hale, & Reb, 2003), or pleasantness-unpleasantness (Yik, Russell, & Feldman Barrett, 1999). This dimension comprises the horizontal axis of the circumplex and is anchored



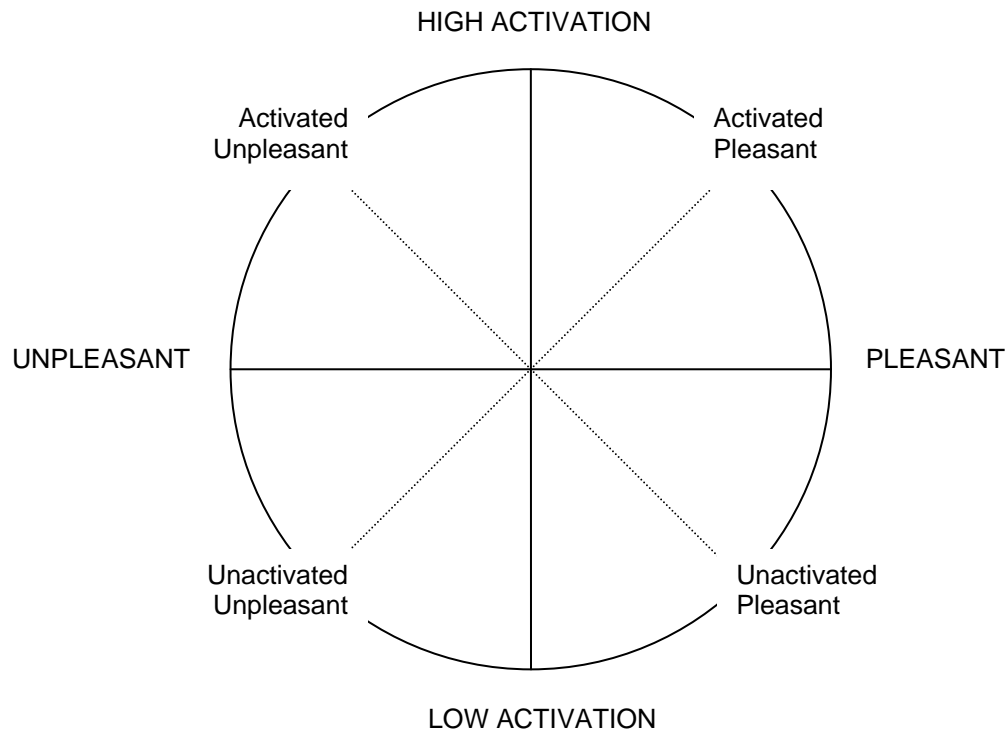
by terms such as *happy* and *contented* for the pleasant pole, and *upset* and *sad* for the unpleasant pole. Following the extraction of the pleasant-unpleasantness dimension, a second dimension was extracted that relates to the intensity with which one experiences positive and negative emotions. This dimension has been labelled activation-deactivation (Cropanzano et al., 2003) and comprises the vertical axis of the circumplex. Terms that anchor this dimension include *tense* and *alert* for the activated pole, and *fatigued* and *calm* for the deactivated pole.

The circumplex model of affect is one of many different structures used to describe affect. To determine the utility of Russell's (2003) core affect, and the circumplex model of affect, it is necessary to examine some of the more popular alternative structures of affect.

The most common and widely cited model of affect was provided by Watson, Clark, and Tellegen (1988) who, following psychometric research, found positive and negative emotions to cluster together. Watson et al. interpreted this as evidence for the separability of positive and negative affect, labelling the cluster of positive emotions positive affect (PA), and the cluster of negative emotions negative affect (NA). High PA is characterised by pleasurable engagement. However, low PA does not indicate presence of negative affect. A low PA state could best be characterised by the absence of positive 'activated' affect (i.e., enthusiastic or excited) indicated by descriptors such as tired or bored (Watson et al., 1988). This also applies to NA, which is characterised by feelings of distress and unpleasurable engagement. High NA is most related to states such as hostility or anger. In contrast, low NA indicates a state characterised by calmness or relaxation. The Positive and Negative Affect Schedule (PANAS) developed

by Watson et al. purports to measure both PA and NA. Participants are asked to rate adjectives on a scale anchored from 1 (very slightly or not at all) to 5 (extremely) according to how strongly that adjective describes how they feel. The adjectives include, distressed, upset, scared, and hostile for NA; excited, enthusiastic, active, and interested for PA. It is important to note that these adjectives do not measure the low poles of each dimension of PA and NA (such as tired and bored or calm and relaxed). This shortcoming has been addressed in an alternative structure of affect, Larsen and Diener's (1992) eight combinations of pleasantness and activation.

Larsen and Diener (1992) began by cautioning researchers that Watson et al.'s (1988) proposed dimension of "Positive Affect" is misleading as it does not consider states such as happiness, contentment, and pleasure to comprise PA. Similarly, Watson et al.'s proposed NA dimension excludes states such as sadness, which is considered a central exemplar of negative affect (Larsen & Diener, 1992). Thus, Watson et al.'s proposed dimensions only sample high activation affective states, thereby excluding a large portion of an individual's affective experience. To correct for this, Larsen and Diener put forth a version of the circumplex model of affect with simpler labels to avoid confusion. The authors began from the premise that affective states vary on both valence and activation. Thus, the horizontal axis of the circumplex is labelled pleasantness, and the vertical axis of the circumplex is labelled activation (see Figure 1.4).



*Figure 1.4: Schematic description of Larsen and Diener's (1992) Affect Circumplex. Adapted from "Structure of Self-Reported Current Affect: Integration and Beyond" by M.S.M. Yik et al., 1999, Journal of Personality and Social Psychology, 77(3), p. 601. Copyright 1999 by the American Psychological Association, Inc. Adapted with permission.*

In Figure 1.4 any state falling in the upper half of the circumplex is prefixed with "activated" whilst any state falling on the right half of the circumplex is prefixed with "pleasant". This yields eight combinations of affect, ranging from activated unpleasant affect, to unactivated pleasant affect. Larsen and Diener (1992) do not provide empirical evidence supporting their model, and as such, no conclusions could be drawn as to its utility. It does however, seem an intuitive structure of affect.

An alternative structure of affect has also been provided by Thayer (1987). In comparison with Larsen and Diener (1992), Thayer proposed a model of affect with a focus on activation rather than activation and pleasantness. Specifically, Thayer's

structure of affect comprises two dimensions, energetic arousal and tense arousal. These dimensions are proposed to form different subjective energy states. For example, calm-tiredness and calm-energy are states that occur without appreciable tension. Such states may be seen as somewhat similar to Larsen and Diener's pleasantness (for calm-energy) and low-activation (for calm-tiredness). Conversely, tense-energy and tense-tiredness are states which involve varying levels of energy with chronic anxiety or tension. Such states may be considered similar with Larsen and Diener's high activation (for tense-energy) and unpleasantness (for tense-tiredness). Empirical support for these separate affective states was provided by Thayer in a study of 18 undergraduates. Following moderate exercise, individuals reported states associated with calm-energy. Thayer also found that following ingestion of a sugar snack, participants reported states associated with tense-energy followed by states associated with tense-tiredness. However these effects were not significant.

These four different structures of affect each attempt to account for an individual's affective experience. In order to draw conclusions regarding the utility of any of these four structures of affect, it is necessary to examine an empirical test of each model. This test was conducted by Yik et al. (1999), who examined the four different structures of affect: Russell's (2003) circumplex; Watson and Tellegen's (1985) positive and negative affect; Thayer's (1987) tense and energetic arousal; and Larsen and Diener's (1992) eight combinations of pleasantness and activation. Yik et al. hypothesised that although these four structures have each been proposed as general descriptors of affective states, considerable overlap occurs such that these four constructs can be integrated into one circumplex model. The authors tested this hypothesis using two separate data sets. The first data set comprised 198 undergraduates from Boston, whilst

the second data set comprised 217 undergraduates from Vancouver. All participants completed the Current Mood Questionnaire (CMQ; which purports to measure momentary pleasant, unpleasant, activated, and deactivated states), in order to test the vertical and horizontal axes of the circumplex respectively. The authors took measures to ensure that the CMQ items did not overlap with those from other constructs. In particular, participants from the Boston sample only completed scales corresponding to Watson et al.'s (1988) PA and NA dimensions. Similarly, participants in the Vancouver sample only completed scales corresponding to Larsen and Diener's and Thayer's constructs of affect. Each of the four constructs was assessed with three scales, all using different response formats. The first scale comprised an adjective list, with adjectives sourced from the original authors of the construct. Each adjective was rated on a Likert scale with responses ranging from 1 (not at all), to 5 (extremely). The remaining two scales comprised a set of statements to which participants indicated their degree of agreement (scale two) and how well the statements described their current feelings (scale three).

Yik et al. (1999) then tested: (a) the bipolarity of the four structures, (b) the adequacy of the measurement model for each structure, (c) whether the dimensions of pleasant-unpleasant and activated-deactivated could account for substantial variance in each structure, and (d) whether the four structures could be incorporated into one two-dimensional circumplex model of affect. The results of the analysis by Yik et al. will thus be presented in the above order beginning with (a) the test of bipolarity.

In the test of bipolarity for the pleasant-unpleasant and activated-deactivated dimensions (measured using the CMQ) in the Boston sample, pleasant-unpleasant correlated at  $-.92$

across the three response formats, whilst activated-deactivated correlated at  $-.77$ . In the Vancouver sample these correlations were  $-.89$  and  $-.71$  respectively. For Watson and Tellegen's (1985) construct, high and low PA correlated at  $-.73$  whilst high and low NA correlated at  $-.79$ . For Larsen and Diener's (1992) construct, activated-pleasant and unactivated-unpleasant correlated at  $-.52$  whilst activated-unpleasant and unactivated-pleasant correlated at  $-.76$ . Thayer's (1987) energy and tiredness dimensions correlated at  $-.69$  whilst the dimensions of tension and calmness correlated at  $-.66$ . These results led Yik et al. (1999) to conclude that although not all pairs could be considered perfect bipolar opposites (as indicated by a correlation approaching  $-1$ ), they fit the pattern expected of bipolar opposites.

Yik et al. (1999) tested the appropriateness of the measurement models for each structure using confirmatory factor analyses. A confirmatory factor analysis of the CMQ, with four latent constructs measuring the pleasant, unpleasant, activated, and deactivated quadrants, provided a moderate fit to the data in the Boston sample ( $\chi^2/df=3.11$ , RMSEA=.10, AGFI=.82, CFI=.95). The measurement model provided a better fit to the data in the Vancouver sample ( $\chi^2/df=2.36$ , RMSEA=.07, AGFI=.87, CFI=.98). In addition, this model provided a significantly better fit to the data in both samples than a model which fixed the correlations between the latent constructs to zero. The measurement model for Watson and Tellegen's (1985) structure provided a good fit to the data ( $\chi^2/df=2.11$ , RMSEA=.07, AGFI=.88, CFI=.98), as did the measurement model's for Larsen and Diener's (1992) structure ( $\chi^2/df=1.75$ , RMSEA=.06, AGFI=.90, CFI=.99) and Thayer's (1987) structure ( $\chi^2/df=2.16$ , RMSEA=.07, AGFI=.88, CFI=.99). For each construct, the model specifying correlations between the latent constructs provided a significantly better fit to the data than a model specifying no

relationship between the latent constructs. Based on these results Yik et al. concluded that the individual structures of the four models were adequately measured.

The main hypothesis of the study conducted by Yik et al. (1999) was that the two dimensions of pleasant-unpleasant and activation-deactivation could account for a large proportion of variance in the four different structures of affect, thereby pointing toward the possibility that these structures were describing the same two-dimensional space and could be integrated into such a space. The authors tested this hypothesis by firstly comparing Larsen and Diener's (1992) structure and Thayer's (1987) structure. The authors found that correlating and combining these two structures into one measurement model resulted in a good fit to the data ( $\chi^2/df=1.81$ , RMSEA=.06, AGFI=.82, CFI=.98). In addition, this model fit the data significantly better than a model in which the correlations between the constructs were fixed to zero. The authors also found that Larsen and Diener's four dimensions and Thayer's four dimensions (hypothesised to be equivalent), were extremely strongly correlated (correlations ranged from .91 to .95). Based on these results, Yik et al. concluded that Thayer's structure and Larsen and Diener's structure were essentially describing the same dimensions of affect.

Following this, Yik et al. (1999) used Structural Equation Modelling (SEM) to predict each construct of the four structures of affect with the pleasant-unpleasant and activated-deactivated dimensions. For instance, in one of the models, the latent variables pleasant-unpleasant and activated-deactivated were used to predict Larsen and Diener's (1992) activated-pleasant construct. Another three models were used to assess the remaining three constructs (unactivated-unpleasant, activated-unpleasant, and unactivated-pleasant). In testing these models, across four measures, the two dimensions

of pleasant-unpleasant and activation-deactivation accounted for between 53% and 77% of variance ( $M=66\%$ ) in Larsen and Diener's constructs when these constructs were treated as unipolar. When Larsen and Diener's constructs were treated as bipolar (i.e., activated-pleasant vs. unactivated-unpleasant) the pleasant-unpleasant and activated-deactivated dimensions accounted for between 81% to 83% variance ( $M=82\%$ ). Similar results were obtained in each of the remaining two structures of affect. For Thayer's (1987) constructs, between 57% and 75% of variance ( $M=64\%$ ) across four measures was accounted for by the pleasant-unpleasant and activated-deactivated dimensions. When Thayer's constructs were treated as bipolar, variance explained rose to between 73% and 80% ( $M=77\%$ ). Similarly, for Watson and Tellegen's (1985) constructs, across four measures the pleasant-unpleasant and activated-deactivated dimensions accounted for between 79% and 90% variance ( $M=87\%$ ). When Watson and Tellegen's (1985) constructs were treated as bipolar, variance explained rose to between 92% and 97% ( $M=95\%$ ). These analyses demonstrated that the three different structures of affect could be adequately explained using the two dimensions of the circumplex model of affect, pleasantness-unpleasantness and activation-deactivation. These results were interpreted by Yik et al. to be supportive of the proposition that the four constructs may be considered alternative descriptors of the same two-dimensional space. Following this, Yik et al. then attempted to integrate each structure into one, two-dimensional circumplex model of affect.

Yik et al. (1999) attempted to identify the nature of the two-dimensional circumplex model by plotting each unipolar construct for each structure of affect using a structural equation modelling program (CIRCUM) that provides estimates of the location of each



variable on a circle. *Pleasant* was designated as the reference variable, and was fixed at zero degrees. Each construct was then estimated relative to *pleasant*. For the Boston sample, the circumplex model provided an inadequate fit to the data ( $\chi^2=43.64$ ,  $df=10$ ,  $p<.001$ ,  $\chi^2/df=4.36$ , RMSEA=.13). Similarly, the circumplex model for the Vancouver sample provided an inadequate fit to the data ( $\chi^2=168.39$ ,  $df=39$ ,  $p<.001$ ,  $\chi^2/df=4.32$ , RMSEA=.12). As RMSEA is dependent on the number of participants sampled, it is possible to model the effect of increasing the sample size presuming the other parameters (such as error and degrees freedom) remain constant. The relationship between sample size and RMSEA is illustrated in Equation 1.1.

$$RMSEA = \sqrt{\frac{\chi^2 - df}{N \times df}} \quad (\text{Eqn. 1.1})$$

$$\text{thus: } \frac{\chi^2 - df}{RMSEA^2 \times df} = N$$

Where  $\chi^2$  = chi-square;  $N$  = number of participants;  $df$  = degrees freedom.

In order to obtain an RMSEA of .08 (the maximum acceptable value), the Vancouver sample would need to be increased to  $N=526$  and the Boston sample would need to be increased to  $N=519$ . The circumplex's for both samples were then superimposed on one another by Yik et al. (1999) to represent all of the unipolar constructs in one two-dimensional model. This model is reproduced from Yik et al. and given in Figure 1.5.

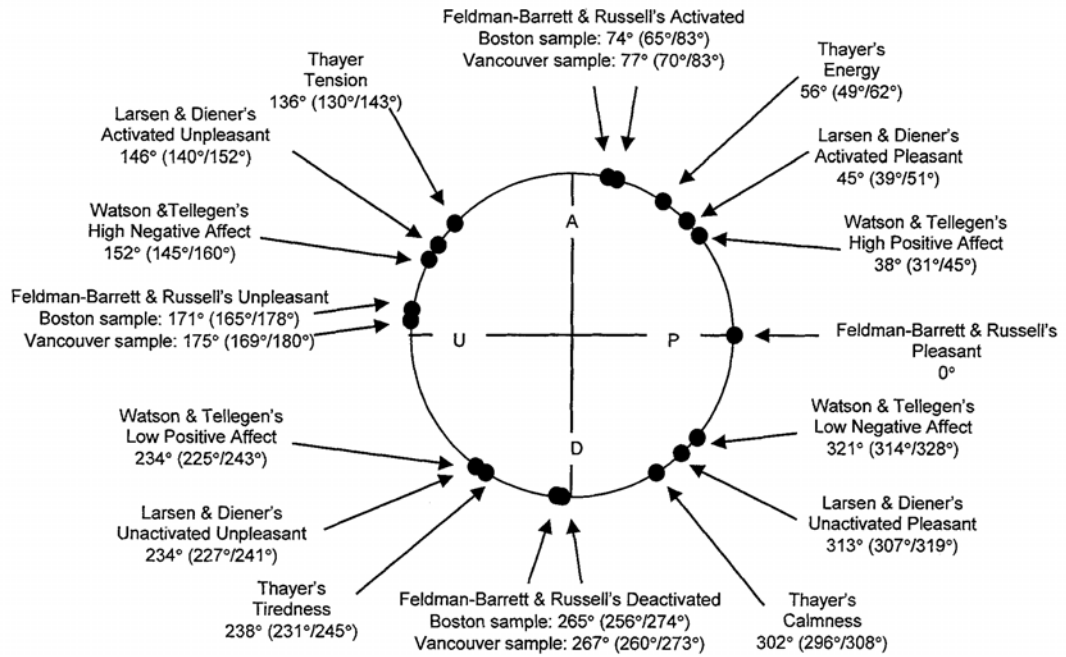
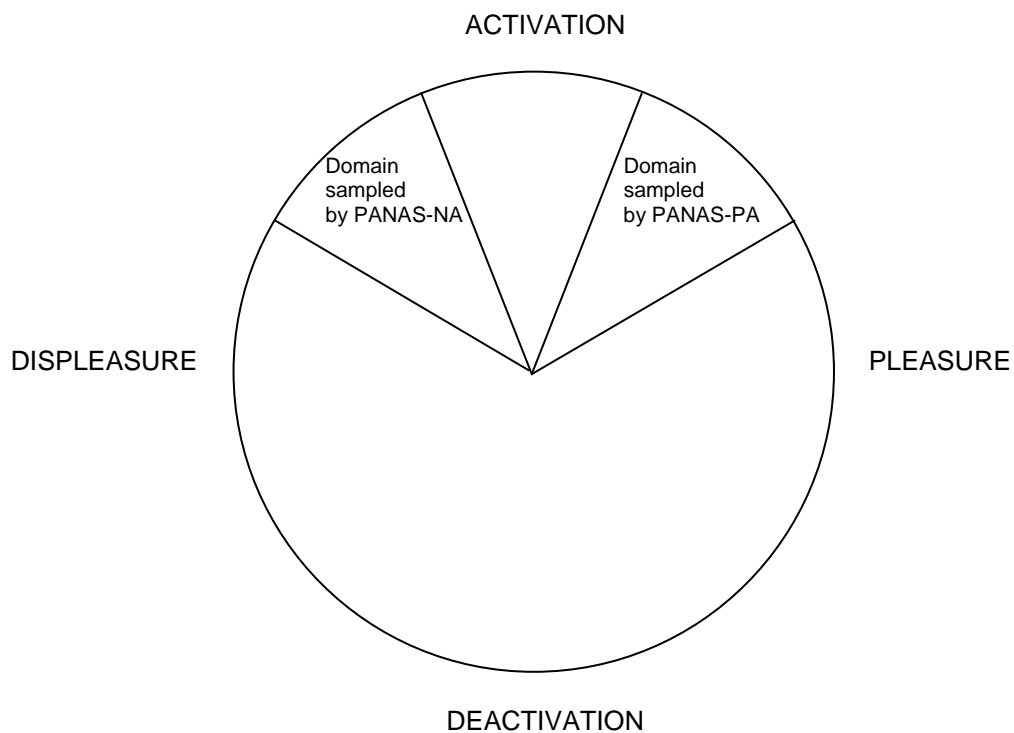


Figure 1.5: A circumplex representation of four alternative structures of affect. From “Structure of Self-Reported Current Affect: Integration and Beyond” by M.S.M. Yik et al., 1999, *Journal of Personality and Social Psychology*, 77(3), p. 615. Copyright 1999 by the American Psychological Association, Inc. Reprinted with permission.

The model presented in Figure 1.5 indicates considerable overlap between Thayer’s (1987) structure of affect, Watson and Tellegen’s (1985) structure of affect, and Larsen and Diener’s (1992) structure of affect. Each unipolar construct fell into each expected quadrant of the circumplex (however as these constructs are similar this is to be expected to a large degree). For example, Thayer’s energy, Watson and Tellegen’s high PA, and Larsen and Diener’s activated-pleasant construct all fell within the pleasant-activated quadrant of the circumplex (top right quadrant). Based on the results testing circumplexity and the overall results across two samples, Yik et al. demonstrated that these three separate structures of affect (Watson & Tellegen’s positive and negative affect, Thayer’s tense and energetic arousal, and Larsen and Diener’s pleasantness and activation) could be adequately integrated into one two-dimensional circumplex model of affect. This circumplex model comprises two bipolar independent dimensions

labelled pleasantness-unpleasantness and activation-deactivation. Thus the circumplex model of affect represents an efficacious measure of affect that attempts to account for a large diversity of affective states.

Watson et al.'s (1988) structure of PA and NA, and the subsequent measurement of these dimensions by the PANAS, can be criticised in light of the evidence presented above for the utility of a circumplex model of affect. The PANAS, as mentioned previously, samples only a small part of the circumplex, namely, the activated-pleasant, and activated-unpleasant quadrants, thereby ignoring the full range of deactivated affective states (see Figure 1.6).



*Figure 1.6: Schematic description of domains of the circumplex model of affect sampled by Watson et al.'s (1988) PANAS. Adapted from Cropanzano et al. (2003). "The structure of affect: reconsidering the relationship between negative and positive affectivity. Journal of Management, 29(6), p. 848.*

Further, a number of empirical studies (e.g., Eid & Diener, 2004; Gutierrez, Jiminez, Hernandez, & Puente, 2005; Headey & Wearing, 1989; Lucas, Diener & Suh, 1996; Napa Scollon, Diener, Oishi, & Biswas-Diener, 2004; Schimmack, 2003) in the subjective wellbeing literature fail to adequately assess affect, using descriptors of affect that often sample only a small portion of the circumplex. Thus, questions of validity are necessarily raised. Conclusions based on inadequate measurement of affect must be analysed and interpreted cautiously. Research into subjective wellbeing, which comprises a strong affective component, should sample the full range of affective states. The circumplex model of affect provides the tool by which this can be achieved.

### *2.3 Global and Domain-based Satisfaction*

The second component of subjective wellbeing has been hypothesised to be cognitive, in which individuals make subjective judgements of satisfaction with their lives (Diener, 1996). According to Diener (1984), a satisfaction judgement involving a global assessment of all aspects of a person's life (sometimes called the life-as-a-whole approach) is a necessary characteristic of subjective wellbeing.

Typically, all measures of SWB include some variant on the life as a whole question. Some researchers have also employed a domain-based approach in conjunction with the life as a whole approach. In this research, individuals not only rate satisfaction with their life as a whole, but also satisfaction with various domains, such as family, relationships, community, and so forth. The two different approaches to measuring life satisfaction have given rise to a debate which revolves mainly around questioning the validity of asking individuals to rate their satisfaction with life as a whole. Some

researchers argue that such an approach necessarily invokes a set of cognitive heuristics, as the cognitive effort required to make a judgement of satisfaction across an individual's life span is too great (Schwarz & Strack, 1999; Kahneman, 1999). Others however, argue that heuristics have little influence on judgements of life satisfaction (Eid & Diener, 2004). These arguments will be considered in more detail in the following section.

### *2.3.1 Global Satisfaction Judgements*

Schwarz and Strack (1999) and Kahneman (1999) both argue that when individuals are asked to rate their satisfaction with life as a whole, a judgment process is invoked that is highly context dependent. They argue that individuals cannot be expected to review all relevant aspects of life that influence their satisfaction. Instead it is proposed by Schwarz and Strack that individuals use information that is either temporarily or chronically accessible at the time. An example of temporarily accessible information would be information that has been used in answering a previous question on a questionnaire. Chronically accessible information is information that is used relatively frequently, and that reflects important aspects of an individual's life. Schwarz and Strack also argue that the life-as-a-whole approach is particularly burdensome as individuals are required to perform a large number of comparisons across many dimensions with poorly defined criteria, which then must be integrated into one composite judgment. In contrast, the domain-based approach involves well-defined criteria, and comparisons are relatively easier to make (Schwarz & Strack, 1999; Schwarz, Strack, Kommer & Wagner, 1987). As such, Schwarz and Strack argue that the domain-based approach yields relatively accurate life satisfaction judgements,

whereas life-as-a-whole judgements are more likely to be inaccurate and influenced by a variety of heuristic strategies, including one's current mood.

Schwarz et al. (1987) provide empirical evidence to support this contention. Individuals ( $N=22$ ) were asked to rate their satisfaction with life-as-a-whole and their satisfaction with the housing domain in either a pleasant or unpleasant room. When in the unpleasant room, individuals reported lower general satisfaction ( $M=8.1$  vs.  $M=9.4$  on a scale ranging from 1 to 11;  $R^2=.19$ ). However these same individuals were more satisfied with the housing domain ( $M=8.6$  vs.  $M=7.4$ ;  $R^2=.09$ ). This was hypothesised to be due to the unpleasant room serving as a comparison point to their own housing. In contrast, the lower general life satisfaction was proposed to be the result of a lower mood induced by being in the unpleasant room, thereby supporting the hypothesis that general life satisfaction is influenced more by mood than by cognitive comparisons.

The argument that heuristics, such as current mood, influences judgements of life satisfaction is refuted by Eid and Diener (2004). These authors conducted an analysis of life satisfaction and mood in 280 college students on three occasions, with four weeks between measurements. Participants completed the Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) and various personality measures, in addition to rating the frequency and intensity of 24 emotions belonging to six emotion groups (love, fear, joy, anger, shame, and sadness). The results indicated that between 9% and 17% of the observed variance was due to occasion-specific variability. This led the authors to conclude that life satisfaction, as well as domain satisfaction, was a stable rather than variable state. In addition, the occasion-specific correlation between mood and global SWB judgements was not significantly different from zero on

two occasions, but was substantive on the third occasion of measurement. The authors proposed that this might have been due to the time the third measurement took place. This measurement was close to the end of the semester, typically when exams would have been taking place. Eid and Diener suggested that the heightened stress of exams likely influenced current mood to the point that this influenced judgements of life satisfaction.

However, the validity of Eid and Diener's (2004) conclusions need to be tempered by the seemingly inadequate conceptualisation of current mood used by the authors. Current mood was assessed by four items, *happy*, *unhappy*, *pleased*, and *depressed*. It is not clear why only four items were chosen to tap into current mood, as other conceptualisations, such as the circumplex model of affect, have been demonstrated to be both a reliable and valid measure of affect (Yik et al., 1999). When a consideration is made of the circumplex model, the adjectives (*happy*, *unhappy*, *pleased*, and *depressed*) chosen by Eid and Diener (2004) to measure current mood are inadequate as these adjectives fall at 0° along the horizontal axis of the pleasure-displeasure dimension. By sampling only this dimension, Eid and Diener (2004) ignore the entire activation-deactivation dimension of affect. Thus, the activated states of happiness, such as excited or upset, and the deactivated states of unhappiness, such as contented or tired, are not measured. This criticism applies equally for the items *pleased* and *depressed*. Using an appropriate measure of affect, such as the circumplex, would have provided results that were both reliable and valid.

Eid and Diener (2004) also found, in contrast to Schwarz and Strack's (1999) hypotheses (i.e., that domain satisfaction would be less affected by current mood), that

mood effects could explain between 7 and 31% of occasion-specific variance in domain satisfaction. This finding provides indirect support for the hypothesis that individuals, when asked to rate their satisfaction, use current mood as a gauge. Surprisingly, this finding is in the opposite direction to that which would be expected by Schwarz and Strack (1999). That is, the task of rating domain satisfaction specifies concrete criteria (individuals are restricted to reporting on a specific domain of life), rendering the use of heuristics less likely. In comparison, the task of rating global satisfaction is considerably more abstract with ill-defined criteria, and as such, heuristics are more likely to be invoked.

Two contrasting findings have emerged from the research of Schwarz and Strack (1999) and Eid and Diener (2004). According to Schwarz and Strack, global judgements of SWB are inherently difficult to make, therefore individuals rely on a number of heuristics (such as current mood) to inform their judgment. Schwarz et al. (1987) demonstrated this effect in which a manipulation of current mood altered self-reported life satisfaction. In contrast, Eid and Diener found that current mood had little effect on judgements of global satisfaction on two out of three occasions, but some effect on judgements of domain satisfaction. However these results do not refute the heuristic hypothesis of Schwarz and Strack. Eid and Diener's argument that mood and heuristics are relatively unimportant in explaining SWB is undermined by an invocation of current mood as an explanation of the significant correlation between global SWB and mood on the third measurement occasion. Their argument is also contradicted by the finding that current mood significantly influenced up to 31% of variance in domain satisfaction. In addition, Eid and Diener's conclusions were based on an inadequate measure of mood.



Accordingly, the current mood heuristic remains a viable hypothesis that attempts to explain how individuals come to make a decision regarding their satisfaction with life.

An individual's positivity has also been proposed as a potential source of knowledge used to inform life satisfaction judgments (Diener, Napa Scollon, Oishi, Dzokoto, & Suh, 2000). Diener et al. agree with Schwarz and Strack (1999) that asking an individual to calculate their overall happiness invites a host of heuristic strategies, as people cannot sum positive and negative experiences over the course of a lifetime to arrive at an overall score. However, Diener et al. suggest that rather than being an artefact and shortcoming of global assessment measures, the strategies used by individuals to derive an overall satisfaction score can provide useful information about the nature of SWB. These researchers hypothesised that precisely because an overall assessment of satisfaction is a vague, ill defined, and inherently difficult task, individuals are more likely to project their norms, views of life, and self-beliefs onto such assessment items. Thus, dispositional tendencies are likely to influence global SWB over and above domain-based satisfaction scores, as assessments of domain satisfaction draw attention to concrete areas of life leaving less room for the influence of top-down processes.

Diener et al. (2000) then set out to empirically test this hypothesis. Specifically, these researchers hypothesised that those with a positive disposition would likely evaluate global life domains higher than specific life domains. Utilising data from 7,167 college students from 41 societies, partial support for this hypothesis was found. An individual's propensity to judge global categories more positively than specific categories was significantly predictive of life satisfaction after controlling for income

( $\beta=.31$ , Total  $R^2=.11$ ). Diener and colleagues then tested whether this positivity would predict life satisfaction over and above the prediction of life satisfaction from scores on five domains; health, finances, friends, family, and religion. The standardised regression coefficient for all the domains taken together predicting life satisfaction was  $.42$ ,  $p<.001$ . In comparison, the standardised regression coefficient for positivity predicting life satisfaction was  $.23$ ,  $p<.02$ . The overall  $R^2$  was  $.27$ . This result indicated that an individual's general positivity predicted life satisfaction after controlling for domain-based satisfaction scores. This supports Diener et al.'s hypothesis that judgments of global SWB are influenced by top-down or dispositional factors. This finding has important implications for understanding the possible influences on judgements of life satisfaction. For instance, it suggests that other dispositions, such as an individual's personality, may exert an influence on assessments of SWB. A discussion of this possibility will be taken up in the following section.

In spite of the finding that global SWB is influenced by dispositional factors, Diener et al. (2000) concluded against abandoning global SWB assessment. These authors consider that global SWB judgments are an important component in the understanding of SWB.

It is clear from the research reviewed above that global judgements of satisfaction are a necessary component in the assessment of subjective wellbeing. However, caution should be taken when interpreting such judgements. As Schwarz and Strack (1999) and Diener et al. (2000) have shown, global judgements are likely to be arrived at via a host of heuristic strategies, rather than via an objective summation of life experiences. Thus, assessment of SWB should not rely exclusively on judgements of global satisfaction.

Ideally, subjective wellbeing should be assessed via the domain-based approach in conjunction with the global approach.

### *2.3.2 Domain Satisfaction Judgements*

The domain-based approach to life satisfaction is often measured by asking individuals to rate their satisfaction with important areas in their life. Within this approach there exists no general agreement to the number and scope of such areas. Cummins (1997) has attempted to define the most likely constituent domains based upon an analysis of 27 definitions used in the literature to identify the quality of life domains. Cummins notes that of these definitions, 85% include emotional wellbeing (happiness, satisfaction, self-esteem, etc.), 70% include health, 70% social and family connections (intimacy), 59% material wealth, and 56% work or some other productive activity. Cummins notes that these five domains have been previously rated in large population surveys as the most important domains.

Following from this discussion of domains, Cummins (1997) presents evidence for the addition of two more domains, that of safety and community. The domain of safety encompasses notions of security, personal control, privacy, independence, autonomy, and competence. Of those 27 definitions noted previously, 22% included a domain related to safety. Based on empirical evidence conducted by Cummins, the domain of safety correlated at .27 with satisfaction, and was rated as .45 in importance. The domain of community encompasses constructs such as (objective) social class, education, job status, community integration, and community involvement. This domain differs from the intimacy domain as an individual's place in community reflects a

hierarchical position within community life that implies no intimacy. Of the 27 definitions mentioned earlier, 30% included a domain related to community. Cummins notes the correlation of the community domain with satisfaction was .34, and the importance of this domain was rated as .28.

In a follow up to Cummins (1997), the same author (Cummins, 1996) undertook further empirical testing to validate his claims for the existence of seven quality of life domains (Cummins, 1997 was originally submitted for publication in 1996; R. A. Cummins, personal communication, June 15, 2006). A search of the literature yielded 152 articles that provided data on life satisfaction. Cummins enforced strict criteria for articles to be included in the study. Articles had to have used a scale containing a minimum of three life domains, representing a broad indication of life quality. These scales must have also reported Likert scale points, direction of scoring, and a numerical average for each domain. Lastly, the scale must have had life satisfaction as its response mode. All articles that had happiness as the criteria were excluded. Thirty-two studies satisfied the above criteria. Within these studies, 173 different terms were used to describe domains of life satisfaction. Each term was classified according to whether it could be placed in one of the seven quality of life domains. Of these 173 different terms, 68% were classified as belonging to one of the seven proposed domains.

Domain satisfaction has been demonstrated empirically to be one of the most powerful statistical predictors of global wellbeing (Andrews & Robinson, 1991). For example, Andrews and Withey (1976) found, after allowing for correlated and random measurement error, that almost all of the explainable variance in their global measure of life satisfaction could be accounted for by specific sets of life concerns. These were

concerns that were close to the self and home (including family, financial resources, and housing). Concerns that were considered more remote contributed less to global subjective wellbeing. These remote concerns included assessments of local and national government.

Domain satisfaction judgements therefore represent an integral part of the assessment of subjective wellbeing. However, there exists a debate within the literature as to the direction of influence regarding domain and global subjective wellbeing. For example, it is not known whether domain satisfaction results from, or rather causes, global life satisfaction. In addition, Andrews and Robinson (1991) and Schmotkin (1998) note that as yet, no one has provided a compelling analysis of this debate for any strong conclusions to be drawn.

#### *2.4 Summary of Subjective Wellbeing Characteristics*

This review began with the aim of furthering an understanding of subjective wellbeing. For this to be achieved, an identification of the characteristics of SWB was undertaken. Based on this, a number of conclusions can be drawn before moving on to discuss the variables thought to influence SWB judgements. Firstly, an investigation of the relation between objective and subjective wellbeing revealed a weak relationship, such that objective indicators are often at odds with subjective indicators. This was highlighted by the rise in economic growth with no equivalent rise in levels of satisfaction with life. Secondly, the affective component of wellbeing was explored. This exploration involved an empirical analysis of structures of affect, which led to the demonstration that four alternative constructs of affect were essentially describing the same

dimensions. As such, these constructs could all be placed inside a two-dimensional circumplex model, with a horizontal axis of pleasantness-unpleasantness and a vertical axis of activation-deactivation. It was concluded that the circumplex model of affect represented an excellent model for SWB research as it incorporated both activated and deactivated affective states. Thirdly, this review indicated that judgements of SWB are made both globally and across domains. However, judgements made using these assessments are influenced by different processes. Specifically, a global assessment of SWB is likely to invoke heuristics, as it is a cognitively complex task to arrive at a judgement of overall life satisfaction. In addition, global judgments of life satisfaction are more likely to reflect individual differences in personality. By contrast, domain judgements of life satisfaction involve concrete criteria, and as such, judgments are less likely to be formed using heuristics. Both forms of SWB measurement have demonstrated utility; accordingly, assessments of SWB must take into account both the global approach, and the domain-based approach. Finally, empirical evidence was summarised for the existence of seven SWB domains.

As the background and characteristics of wellbeing have been highlighted, the discussion now turns towards the identification of variables that are thought to exert a strong influence on SWB judgements. Following this, an analysis of theories that attempt to bring together such variables into comprehensive accounts of how an individual arrives at a judgement of life satisfaction will be presented.

### **3. Dispositional Influences on Subjective Wellbeing**

The major focus of early research in the quality of life field was to identify the bottom-up or situational influences on SWB. However these researchers were typically disappointed with the relatively small effect sizes found (Diener, 1999). For instance, in a survey of over 2,100 North Americans conducted by Campbell et al. (1976), demographic factors (i.e., age, sex, income, race, education, and marital status) accounted for less than 20% of the variance in SWB. In a similar North American survey of over 1,200 participants conducted in the 1970s, Andrews and Withey (1976), using the same variables, could only account for 8% of the variance in SWB. Similarly, Andrews and Robinson (1991) note that demographic variables, even when taken together, rarely explain more than 10% of the variance in happiness or satisfaction scores. In a recent review of the correlates of happiness, Argyle (1999) concluded that although demographic variables may only account for 15% of variance, these effects remain after controlling for the influence of other demographic variables (i.e., the effect of ethnicity remains after controlling for income, education, and occupation). In addition, the effects are stronger for different groups, such as income on the poor, and religion on the old. Thus although demographic variables are not irrelevant, the small effects found have led researchers to focus on top-down or dispositional factors in the search to explain the remaining variability in SWB.

#### *3.1 Extroversion, Neuroticism, and Subjective Wellbeing*

A number of studies have been conducted over the past 40 years that have examined the effects of a variety of variables on SWB. One of the most consistently studied set of

variables in SWB research is that of personality. In particular, the most commonly studied dimensions of personality are extroversion and neuroticism, which are generally agreed to comprise at least two of the major dimensions of personality (Eysenck, 1997). In addition, extroversion has been found to relate to positive affectivity (Costa & McCrae, 1980, 1989; Emmons & Diener, 1985; Fleeson, Malanos, & Achille, 2002; Gross, Sutton & Ketelaar, 1998; Hayes & Joseph, 2003; Lucas, Diener, Grob, Suh, & Shao, 2000), whilst neuroticism has been found to relate to negative affectivity (Costa & McCrae, 1980, 1989; Emmons & Diener, 1985; Fleeson et al., 2002; Gross et al., 1998; Hayes & Joseph, 2003). It is worthwhile to reiterate that negative affect and positive affect are thought to comprise the affective dimension of SWB. Extroversion and neuroticism are also thought to be positive and negative contributors to life satisfaction respectively (Emmons & Diener, 1985; McCrae & Costa, 1991; Myers & Diener, 1995). Cummins, Gullone, and Lau (2002) note that much of the literature examining the link between SWB and these two dimensions of personality have found robust correlations. The following sections will examine, in detail, the evidence presented in support of the proposition that extroversion and neuroticism influence SWB.

### *3.1.1 Extroversion and Subjective Wellbeing*

In an attempt to understand the fundamental features of extroversion, Lucas et al. (2000) characterised this construct as reflecting systematic differences in an individual's behaviour toward, and feelings about others. Further, Lucas et al. presented evidence that extroversion consists of three components. Firstly, affiliation, a tendency to enjoy and value close interpersonal bonds in addition to being warm and affectionate;



secondly, ascendance, which relates to social dominance, assertiveness and leadership, and finally; venturesome, a feeling of excitement seeking and desire for change. In addition, extroversion was found by the authors to exhibit a strong positive relation to positive affect. The average correlation between extroversion and positive affect over five samples (combined  $N=6,632$ ) was .74.

Subsequent to the finding that extroverts report greater positive affect (Costa & McCrae, 1980, 1989; Emmons & Diener, 1985; Fleeson et al., 2002; Gross et al., 1998; Hayes & Joseph, 2003; Lucas et al., 2000), research in the quality of life field has attempted to examine whether extroversion can predict variance in individual reports of SWB. Emmons and Diener (1985) were one of the first researchers to conduct such an examination. The impetus of their study was centered on the premise that previous analyses finding positive relationships between extroversion and PA had implemented poor measures of affect, namely Bradburn's (1969) affect scale (which was noted by the authors to suffer from low reliability). In the study conducted by Emmons and Diener, affect was measured at the end of each day in two samples (sample 1,  $N=74$ ; sample 2,  $N=62$ ) for 84 and 56 consecutive days respectively (the samples corresponded to undergraduate students enrolled in different university semesters). Mood was assessed via four adjectives representing PA (happy, joyful, pleased and enjoyment/fun) and five adjectives representing NA (unhappy, depressed, frustrated, worried/anxious, and angry/hostile; the authors treated *enjoyment/fun*, *worried/anxious*, and *angry/hostile* as three adjectives rather than six). These items were chosen based on earlier factor analytic work by the authors. A battery of personality measures were utilised that included the Eysenck Personality Inventory (EPI), Rotter's (1966) Locus of Control scale, and the 16 Personality Factors (16PF). Life satisfaction was measured via the

SWLS (Diener et al., 1985) which consists of five items designed to measure global life satisfaction, a cognitive judgment of satisfaction with one's life as a whole.

Emmons and Diener (1985) found that when the EPI was used as the measure of extroversion, the correlation between extroversion and PA was .31 and .32 in both samples respectively. The correlation between extroversion and the SWLS was .29 and .30. The authors then broke down the dimension of extroversion into its constituents, and when done so, only the sociability component significantly correlated with PA (.29 and .49) and SWLS (.34 and .40) across the two samples. Furthermore, a similar pattern of results was found using a different measure of sociability (EASI-III survey of temperaments). Extroversion (as measured by EASI-III) correlated moderately with PA (.44 and .49) and SWLS (.55 and .30) across both samples. A composite of the EASI-III sociability scale and the EPI sociability items were then taken to form one variable in a multiple regression predicting life satisfaction. This computation yielded an  $R^2$  of .34,  $p < .001$ . Thus, 34% of variance in life satisfaction scores in these samples could be predicted by the sociability component of extroversion.

Emmons and Diener's (1985) research provides some evidence that extroversion is related to reports of increased SWB. Recent research has replicated the moderate correlation between extroversion and life satisfaction, with Hayes and Joseph (2003) reporting a correlation of .42 between extroversion and SWLS in a sample of 111 individuals in the United Kingdom. However in a multiple regression predicting SWLS with extroversion, neuroticism, and conscientiousness, the beta weight for extroversion was only .09 ( $sr^2_e = .002$ ; where relevant effect sizes are not provided, these are

estimated (indicated by  $sr_e^2$ ) using the formula provided in Equation 1.2; Cohen, Cohen, West & Aitken, 2003).

$$sr_e^2 \approx \left( \frac{\beta_i}{\sum |\beta_i|} \times R^2 \right)^2 \quad (\text{Eqn 1.2})$$

Where  $\beta_i$  = beta weight of interest;  $\sum |\beta_i|$  = sum of all beta weights regardless of sign

In a study of 344 men and 256 women, Costa and McCrae (1989) found extroversion correlated with life satisfaction at only .17 for men, and .20 for women. The relationship between extroversion and SWB was also explored in a cross-cultural analysis conducted by Zheng, Sang, and Lin (2004). The authors examined this relationship in a sample of 201 Chinese students. Individuals completed a shortened form of the Eysenck Personality Questionnaire (EPQ), the SWLS, a positive affect scale, and a negative affect scale. The authors found that extroversion significantly predicted life satisfaction ( $r=.29$ ,  $\beta=.17$ ,  $sr_e^2=.001$ ) and positive affect ( $r=.37$ ,  $\beta=.14$ ,  $sr_e^2=.002$ ). However, the  $sr_e^2$  values indicate a relatively weak unique effect. In addition, the dimensions of the EPQ, extroversion, neuroticism, psychoticism, and the lie scale, only predicted 12% of variance in life satisfaction. These dimensions accounted for slightly more variance in positive affect (19%) and negative affect (33%). Whilst the results of Zheng et al. (2004) are consistent with Costa and McCrae, both sets of results are inconsistent with Emmons and Diener (1985), suggesting that extroversion may only be weakly related to SWB.

DeNeve and Cooper (1998) conducted a comprehensive empirical exploration of the relation between personality and SWB via a meta-analysis of 137 personality traits. To be included in the meta-analysis, a study had to include a valid measure of SWB

(operationalised as life satisfaction, happiness, or current PA or NA) and at least one personality variable as one of the measures. Application of this criteria resulted in the inclusion of 148 studies, yielding 42,171 respondents. The authors found an overall average weighted correlation of personality with SWB of .19. When overall SWB was correlated with each of the Big Five personality factors (extroversion, agreeableness, conscientiousness, neuroticism, and openness to experience), neuroticism and conscientiousness exhibited the strongest correlations,  $r=-.22$  and  $r=.21$  respectively, whilst extroversion correlated at .17 with SWB. The relationship between extroversion and SWB was further analysed by breaking down SWB into its hypothesised components: life satisfaction, PA, and NA. The correlation for extroversion with life satisfaction was .17, with PA was .20, and with NA was -.07. These correlations are in agreement with the correlations reported by Costa and McCrae (1989) and provide additional support for the proposition that extroversion is only weakly related to SWB. In addition, the correlations found by DeNeve and Cooper had a range of .17 to .20, much lower than those reported by Emmons and Diener (1985; extroversion and life satisfaction, *mean*  $r=.36$ , sociability and PA, *mean*  $r=.39$ ).

The above studies demonstrate that although extroversion does explain some variance in SWB, there remains considerable variance unaccounted for. Furthermore, four of the five studies reviewed found that extroversion was only weakly related to SWB (Costa & McCrae, 1989; DeNeve & Cooper, 1998; Hayes & Joseph, 2003; Zheng et al., 2004).

### *3.1.2 Neuroticism and Subjective Wellbeing*

Neuroticism, comprising the second fundamental dimension of personality, has been found to relate to the experience of negative affect (Costa & McCrae, 1989; Emmons & Diener, 1985; Fleeson et al., 2002; Gross et al., 1998; Hayes & Joseph, 2003). Individuals who score high on the dimension of neuroticism are reported to be characteristically worrisome, nervous, emotional, insecure, inadequate, and hypochondriacal (Pervin & John, 2001). Thus, as negative affectivity is said to comprise part of the affective dimension of SWB (Diener, 2000), it is likely that neurotics would experience decreased levels of SWB.

Emmons and Diener (1985), in addition to examining the influence of extroversion on SWB, also examined the influence of neuroticism on SWB. Using the same methodology as reported previously, neuroticism was found to correlate significantly with PA (-.31) and SWLS (-.31) in sample 1 only, whilst strongly correlating with NA in both sample 1 and sample 2 (.61 and .33 respectively). When the EASI-III was used as the measure of neuroticism, the correlation between neuroticism and NA for sample 1 decreased to .40, whilst for sample 2, increased to .42. These results indicate that, for the individuals in Emmons and Diener's study, those high on neuroticism experienced less positive affect and more negative affect than those low on neuroticism. This adds further weight to the argument that neuroticism is strongly related to negative affectivity. The relation to global life satisfaction however, was inconsistent across studies. The results in study 1 indicated that the EASI-III and EPI measures of neuroticism correlated -.23 and -.31 respectively with life satisfaction. However, in study 2, these correlations fell dramatically and were non-significant (-.03 and -.08

respectively). Thus, the influence of neuroticism on life satisfaction cannot be concluded from this study due to the inconsistent results across samples.

Zheng et al. (2004), in addition to investigating the influence of extroversion on SWB, also investigated the relation between neuroticism and SWB. Using the same methodology as reported earlier, Zheng et al. found neuroticism to be a strong predictor of negative affect ( $r=.57$ ,  $\beta=.60$ ) and a moderate predictor of positive affect ( $r=-.37$ ,  $\beta=-.27$ ). However neuroticism was only weakly related to life satisfaction ( $r=-.28$ ,  $\beta=-.18$ ). In addition, as reported previously, extroversion and neuroticism only accounted for 12% variance in life satisfaction. These results provide further evidence that neuroticism is strongly linked to the experience of negative affect; however it seems that neuroticism is only weakly related to life satisfaction.

Further investigation of the relationship between neuroticism, negative affect, and SWB comes via DeNeve and Cooper's (1998) meta-analysis. These authors found an overall correlation of  $-.22$  between neuroticism and overall SWB. When SWB was broken down into life satisfaction, PA and NA, of the Big-Five personality dimensions neuroticism was the strongest predictor of life satisfaction ( $r=-.24$ ), and negative affect ( $r=.23$ ).

As was the case with extroversion and SWB, significant variation occurs between studies in the strength of the relation found between neuroticism and SWB. As such, the strength of relationship between neuroticism and SWB cannot be conclusively determined.

One of the most important findings to arise from the above examination of research investigating the influence of extroversion and neuroticism on SWB, comes from DeNeve and Cooper's (1998) meta-analysis. Specifically, of the 137 personality traits, the strongest predictor of SWB was not extroversion or neuroticism, but repressive defensiveness ( $r=-.40$ ), described as a denial of an experience of threatening information and of the negative emotions following this experience. The next strongest predictors of SWB included locus of control-chance ( $r=-.34$ ), desire for control ( $r=.34$ ), and private collective self-esteem ( $r=.31$ ).

Thus it can be concluded from DeNeve and Cooper's (1998) meta-analysis, and from the variation in results across studies, that personality explains little variance in SWB, and as such, focussing solely on extroversion and neuroticism is shortsighted and ignores other potential influences on SWB. This view is supported by McCrae and Costa (1991), the proponents of the Five-Factor model of personality, who found extroversion, neuroticism, and openness to experience only explained between 10 to 18% of variance in SWB. Furthermore, these authors suggested that if extroversion and neuroticism were measured by asking about the frequency and intensity of positive and negative emotions, then the resulting scales would invariably load onto extroversion and neuroticism factors. This raises the possibility that the effects of extroversion and neuroticism on SWB are due to the underlying positive and negative affectivity in extroversion and neuroticism respectively. Partialling out the variance due to affect in extroversion and neuroticism, and measuring the subsequent relation to SWB, would provide a more accurate estimate of the effect of extroversion and neuroticism on SWB.

The weak relation between extroversion, neuroticism, and SWB has led Diener, Oishi, and Lucas (2003) to argue for an examination not only of other traits that may influence SWB, but also of non-trait features of personality, such as one's goals, that relate to SWB constructs. As this review demonstrates the two personality dimensions of extroversion and neuroticism are only weakly related to SWB, other factors must directly influence judgements of SWB (it is possible that extroversion and neuroticism influence SWB indirectly; a possibility that is taken up in later discussions). This view is supported by Zheng et al. (2004) who note that personality often explains no more than 30% of variance in SWB. The search for alternative factors to explain the remaining variance in SWB has resulted in a variety of cognitive variables put forth. A good starting point to discern which variables are important in predicting SWB is DeNeve and Cooper's (1998) meta-analysis. These authors found some of the strongest predictors of SWB were not extroversion and neuroticism, but were locus of control and self-esteem. In addition, Myers and Diener (1995) argued that the four inner traits of self-esteem, sense of personal control, optimism, and extroversion are characteristic traits of happy people. As such, the proceeding section will investigate the influence of the variables self-esteem, optimism, and perceived control on SWB.

### *3.2 The relation of Self-esteem, Optimism, and Perceived Control to SWB*

As DeNeve and Cooper (1998) have found, extroversion and neuroticism are not the most powerful predictors of SWB. Their meta-analysis presented evidence that how people thought about and explained what happened in their lives strongly predicted SWB (DeNeve, 1999). That is, individuals who did not believe they controlled their lives reported low life satisfaction, whereas individuals who desired control and



believed that they had control over themselves and the events that occurred in their lives, exhibit increased life satisfaction. Similarly, appraising events in an optimistic fashion and engaging in active coping strategies has been associated with heightened SWB (DeNeve, 1999; Myers & Diener, 1995). Finally, a positive sense of self-esteem, that is, evaluating yourself in a positive fashion, has also been found to positively influence SWB (DeNeve & Cooper, 1998). These three variables of self-esteem, optimism, and perceived control have been grouped together by Cummins and Nistico (2002) as relating to satisfaction with the self. Satisfaction with the self may explain at least some of the remaining unaccounted variance in SWB. Prior to an examination of the evidence suggesting these variables influence SWB, it is important to demonstrate that such variables can be discriminable from SWB.

To examine the discriminability of a construct, Campbell and Fiske (1959) state that more than one variable and more than one method of measurement must be used. When these conditions are met, Campbell and Fiske provide two criteria that can be used to assess discriminability. For the first criterion, the convergent validity coefficient (the correlation between the same variable measured using a different valid method) should exceed the correlation between that variable and any other variables not sharing common methods of measurement. The second criterion requires that the correlation between a variable measured using different valid methods exceed the correlations between different variables using the same method of measurement.

Lucas et al. (1996) applied these criteria to demonstrate that life satisfaction, self-esteem, and optimism were separate constructs. The authors measured these constructs in three separate samples (sample 1  $N=212$ , sample 2  $N=109$ , sample 3

$N=172$ ). In the first sample, self-report measures of life satisfaction, self-esteem, and optimism were completed on two separate occasions, two weeks apart. Informant reports from friends or family members were also obtained, however informant reports are somewhat unreliable. (For instance, self-rated and peer-rated performance in an organisational context was found to correlate at only .38 (van Hooft, van der Flier & Minne, 2006). In addition, in a review of self-and informant reports in the general population and college students, Cummins (2002) found, across seven separate studies, correlations ranging from .25 to .65 ( $M=.48$ ,  $SD=.13$ ). This led the author to conclude that informant reports cannot be regarded as valid estimates of a person's SWB. As such the results relating to informant reports were not considered.) For the second sample, Lucas et al. extended the time between completion of self-reports to two years. In the third sample, two different measures of each construct were completed on two separate occasions, two days apart. After constructing and analysing multi-trait multi-method matrices for each construct and sample, the authors found that across all three samples, life satisfaction met the two criteria for evidence of discriminability 100% of the time. For all three constructs there were only four failures out of 36 comparisons in which the criteria for discriminability were not met. Further, all of these four failures were due to low correlations between the alternative measure of optimism (the hopelessness scale) in sample 3. Thus, in this study, life satisfaction was discriminable from self-esteem and optimism. To date there are no published studies examining the discriminability of perceived control and life satisfaction.

### 3.2.1 *Self-esteem*

Self-esteem has been characterised as a cognitive evaluation of our own worthiness (Cummins et al., 2002). Self-esteem is one of the most widely studied variables in psychology; in 2007 the PsychInfo database returned 27,544 results for self-esteem (in comparison, subjective wellbeing returned 1,637 results). This popularity has subsequently led to self-esteem being investigated as a possible correlate of SWB. In one such study, Cummins and Nistico (2002) presented zero-order correlations for six studies relating self-esteem to life satisfaction. The correlations ranged from .54 to .77. Thus, compared to the weak to moderate correlations found between extroversion and neuroticism and SWB, self-esteem seems to relate substantially with SWB. That is, those with high levels of self-esteem reported higher levels of satisfaction with life. These results led Cummins and Nistico to conclude that satisfaction with the self was one of the strongest predictors of subjective quality of life found to date.

In a review article, Diener (1984) also noted that self-esteem was one of the strongest predictors of SWB. Further empirical support for this statement was provided by Emmons and Diener (1985), who found self-esteem to correlate .26 with overall life satisfaction. Furthermore in a hierarchical regression controlling for extroversion, self-esteem added significantly to the prediction of overall life satisfaction, accounting for an additional 11% unique variance. Furthermore, in DeNeve and Cooper's (1998) meta-analysis of 137 personality traits, private collective self-esteem was found to be one of the strongest correlates of SWB ( $r=.31$ ).

A moderate correlation between life satisfaction and self-esteem was also found in a cross-cultural analysis of 13,118 college students across 31 countries and 5 continents ( $r=.47$ ; Diener & M. Diener, 1995). In a linear regression, the authors found self-esteem was the strongest predictor of overall life satisfaction ( $r=.47$ ,  $\beta=.32$ ), above that of family satisfaction ( $r=.36$ ,  $\beta=.15$ ), satisfaction with finances ( $r=.37$ ,  $\beta=.24$ ), and satisfaction with friends ( $r=.39$ ,  $\beta=.21$ ). The size of the relation between life satisfaction and self-esteem was moderated by the level of individualism characteristic of the country. Countries rated as individualistic had a stronger relationship between self-esteem and life satisfaction than countries rated as collectivist. Lucas et al. (1996) also found self-esteem correlated strongly with life satisfaction ( $r=.59$ ). Similarly, Compton (2000) reported a correlation of .51 between self-esteem and life satisfaction in a study of 347 students and community residents.

The above studies provide empirical support for the proposition that a strong sense of personal worth is associated with increased life satisfaction. These findings also seem to vindicate the strong conclusions of Diener (1984), Cummins et al. (2002), and Cummins and Nistico (2002), that self-esteem is one of the strongest predictors of SWB.

### *3.2.2 Optimism*

The second component comprising overall satisfaction with the self, according to Cummins and Nistico (2002), is the trait of dispositional optimism. This refers to the general expectancy of favourable outcomes in one's life (Scheier & Carver, 1985). According to Scheier and Carver, optimists are more likely to expect positive outcomes, and as such, are more likely to work towards achieving these outcomes. Pessimists on

the other hand, expect negative outcomes, and therefore are quicker to disengage from working towards their goals. These differences make it likely that optimists achieve positive outcomes more often than pessimists, who are likely to experience a greater number of negative outcomes (Scheier & Carver). The increased positive experiences of optimists has been hypothesised to translate to increased SWB (Diener et al., 1999). Empirical investigations support this hypothesis. For example, Cummins and Nistico (2002) report three studies in which optimism correlates positively with life satisfaction in the general population ( $r=.23$ ,  $N=184$ ), in college students ( $r=.54$ ,  $N=493$ ), and in daughter caregivers ( $r=.49$ ,  $N=296$ ). Lucas et al. (1996) also found optimism correlated strongly with life satisfaction ( $r=.60$ ) and positive affect ( $r=.55$ ), and moderately with negative affect ( $r=-.38$ ). Similarly, Compton (2000) reported a correlation of .52 between optimism and life satisfaction. Thus it seems that individuals who report a greater sense of optimism generally report more positive affect, less negative affect and higher life satisfaction.

### *3.2.3 Perceived Control*

The third component of Cummins and Nistico's (2002) satisfaction with the self is perceived control. One of the most common and widely studied conceptualisations of perceived control is Rotter's (1966) locus of control, which is divided into external and internal locus of control. A person with an internal locus of control believes that events and outcomes are within his or her immediate control. A person with an external locus of control will perceive events and outcomes to be caused by (controlled by) external agents such as luck or powerful others (Cummins et al., 2002). In a sample of 968 Spanish adolescents (aged 12 to 16 years), Casas, Gonzalez, Figuer, and Coenders

(2004) found external control correlated with life satisfaction at  $-.29$ ,  $p < .001$ , whilst internal control correlated with life satisfaction at  $.28$ ,  $p < .001$ . Similarly, Compton (2000) found internal locus of control correlated at  $.34$  with life satisfaction.

Other definitions of perceived control highlight the relation between control and behaviour. For instance, Peterson (1999) defines perceived control as behaving in ways to maximise good outcomes and/or minimise bad outcomes. Furthermore, Peterson argues that a positive sense of control is often linked to increased life satisfaction, whereas a lack of control is linked to passivity, failure to attain goals, and even illness. Similarly, Myers and Diener (1995) argue that happy people are those that have a greater sense of personal control. The authors argue that such people are empowered, cope better with stress, achieve goals and live more happily. Cummins and Nistico (2002) report nine studies in which perceived control is correlated with life satisfaction (combined  $N=1,558$ ). Of those nine studies, five investigated control and life satisfaction in spinal injury patients, one in daughter caregivers, one in renal transplant patients, one in the general population and one in adolescents. The correlations between perceived control and life satisfaction ranged from  $.16$  in the general population to  $.57$  in the spinal injury population. The average correlation across all nine studies was  $.41$ . Thus, those who report a positive sense of perceived control seem to experience greater life satisfaction. The mechanism by which this operates remains to be explicated. Further, the inconsistent results across the studies indicate that the relationship between perceived control and SWB cannot be conclusively determined.

### *3.3 Summary of Subjective Wellbeing Dispositional Influences*

It has been demonstrated empirically that whilst extroversion and neuroticism are only weakly related to subjective wellbeing, the cognitive variables linked to satisfaction with the self (self-esteem, optimism, perceived control), positively and moderately influence judgements of life satisfaction. However for quality of life research to advance, it is not simply enough to describe variables that relate to judgements of life satisfaction. Researchers must go beyond such descriptions and move towards the development of theories that attempt to elucidate the mechanisms by which variables such as self-esteem, optimism, and perceived control influence SWB. One such attempt has been made by Cummins et al. (2002), who integrated the three variables of self-esteem, optimism, and perceived control into a homeostatic theory of SWB. This homeostatic theory of SWB is an extension and elaboration of a homeostatic theory originally proposed by Headey and Wearing (1987, 1992). Thus, before evaluating the efficacy of Cummins homeostatic theory, it is necessary to firstly examine the origins of this theory.

## CHAPTER 2: THEORETICAL MODELS OF SUBJECTIVE WELLBEING

### *2.1 Headey and Wearing's Dynamic Equilibrium Model of Subjective Wellbeing*

Headey and Wearing (1989, 1992) were the first researchers to propose a homeostatic theory of SWB. The authors arrived at their theory in order to explain why most quality of life research had found consistently high levels of SWB among individuals from all major social groups in Western industrialised countries (with the exception of black South Africans, see Moller, 1998; Moller & Dickow, 2002). Headey and Wearing argued that this finding was largely unexpected because at face value, it seemed unlikely that such a large majority of individuals were so satisfied with their lives. Thus, instead of attempting to explain the relatively small amount of variance in people's ratings, Headey and Wearing set out to develop a theory that would account for both the high average levels of SWB, in addition to the variance in individual ratings. To do this comprehensively, Headey and Wearing implemented a longitudinal panel study in which an initial representative sample of 942 people were followed up on five occasions (1981, 1983, 1985, 1987, and 1989).

In Headey and Wearing's (1989, 1992) study, SWB was measured using Andrew and Withey's (1976) life-as-a-whole index, the life-fulfillment index (Headey & Wearing, 1992), SWLS (Diener et al., 1985), Fordyce's 0 to 10 happy scale, and Bradburn's (1969) positive affect scale. On the basis of factor analyses, Headey and Wearing combined the life satisfaction measures into a composite index that gave equal weight to the four scales (life-as-a-whole, life fulfillment, SWLS, and 0 to 10 happy scale). As the last two scales were not available until the 1987 survey, the index was only used in the



cross-sectional analyses of the 1987 and 1989 data. A composite index giving equal weight to life-fulfillment and life-as-a-whole was used for all waves of data. In addition to measuring life satisfaction and positive affect, Headey and Wearing implemented measures of psychological distress to investigate the relation between SWB and illbeing. These measures included a shortened version of the General Health Questionnaire (GHQ), which focuses on somatic symptoms and negative affects, Spielberger's state anxiety scales (STAI), Beck's Depression Inventory (BDI) and Bradburn's negative affect scale, which covers both anxiety and depression. The BDI and Spielberger's scales were only available for the 1987 and 1989 data; as such, Bradburn's negative affect scale was used for analysis of change data between 1981 and 1989. In addition to measures of SWB and psychological distress, Headey and Wearing used Eysenck's personality inventory (EPI) as measure of extroversion and neuroticism. From 1987 onwards, Headey and Wearing included a facet of Costa and McCrae's (1995) openness to experience personality trait, 'openness to feelings'. In addition, a measure of personal competence was included, combining internal locus of control and the sense that a person feels capable of planning, organising, and controlling his or her own life. A summary of the scales used at each measurement time point is provided in Table 2.1.

Table 2.1: Scales used by Headey and Wearing (1989, 1992) according to time of measurement.

Measure	Scale	1981	1983	1985	1987	1989
LS	Life-as-a-whole (Andrews & Withey)	✓	✓	✓	✓	✓
LS	Life-fulfillment index (Headey & Wearing)	✓	✓	✓	✓	✓
LS	SWLS (Diener et al.)	X	X	X	✓	✓
LS	Fordyce 0 to 10 Happy scale	X	X	X	✓	✓
LS	LS composite scale (all four scales)	X	X	X	✓	✓
LS	LS composite scale (Andrews & Withey; Headey & Wearing)	✓	✓	✓	✓	✓
Positive Affect	Bradburn PA scale	✓	✓	✓	✓	✓
Negative Affect	Bradburn NA scale	✓	✓	✓	✓	✓
Illbeing	General Health Questionnaire	✓	✓	✓	✓	✓
Illbeing	Spielberger's State Anxiety Scale (STAI-S)	X	X	X	✓	✓
Illbeing	Beck Depression Inventory (BDI)	X	X	X	✓	✓
Personality	Eysenck Personality Inventory – Extroversion	✓	✓	✓	✓	✓
Personality	Eysenck Personality Inventory – Neuroticism	✓	✓	✓	✓	✓
Personality	Eysenck Personality Inventory – Openness to feelings	X	X	X	✓	✓
Personality	Personal competence	X	X	X	✓	✓
Life Events	Modified version of List of Recent Experiences (LRE)	✓	✓	✓	✓	✓

The premise from which Headey and Wearing (1989, 1992) began their study was that most people report a high average level of SWB. In support of this premise, Headey and Wearing presented results from the European and Australian Values Survey's, conducted from 1981 to 1983. These surveys, which included countries from beyond Europe such as the USA and Japan, indicated that life satisfaction (rated on a 0 to 10 scale, 0=dissatisfied, 10=satisfied) fell well above the midpoint. With the exception of black South Africans, all countries reported average LS above 6.5. The results of Headey and Wearing's longitudinal panel data provide additional support for the premise that most people report an above average level of satisfaction with life. The mean score for the life satisfaction index measured in 1983 was 6.8 ( $SD=1.0$ ; Headey & Wearing, 1989).

In their analysis of the longitudinal panel data, Headey and Wearing found evidence that extroversion and neuroticism accounted for variance in SWB. Specifically, extroversion was found to correlate .26 with LS, .22 with PA, -.17 with anxiety, and -.23 with depression. Neuroticism correlated -.34 with LS, -.12 with PA, .40 with anxiety, and .46 with depression. Personal competence was also strongly related to depression (-.42), and moderately to anxiety (-.28), PA (.22), and LS (.34). Openness to feelings correlated weakly with LS (.08) and PA (.18) and non-significantly with anxiety and depression. This data supports the previous conclusion that extroversion and neuroticism only account for a small amount of variance in SWB. Individuals in Headey and Wearing's study that were high on extroversion reported slightly higher life satisfaction and PA, and lower anxiety and depression. Conversely, highly neurotic individuals reported lower LS and PA, and higher psychological distress. In addition, and consistent with previous research (Cummins & Nistico, 2002; DeNeve & Cooper, 1998), having a positive sense of personal competence and control protected from depression and anxiety and led to increased feelings of positive affectivity and life satisfaction.

The longitudinal nature of the data enabled Headey and Wearing (1989, 1992) to test their hypothesis that each person had a stable, equilibrium level of SWB that is influenced by stable personality characteristics. In this test, Headey and Wearing computed over-time correlations of LS, PA, and NA. These correlations are reproduced in Table 2.2.

Table 2.2: Over-time correlations of LS, PA, and NA from Headey &amp; Wearing (1992).

<b>Measure</b>	<b>1981-83</b>	<b>1981-85</b>	<b>1981-87</b>	<b>1981-89</b>
LS	.64	.57	.52	.43
PA	.39	.31	.35	.25
NA	.42	.36	.40	.39

The correlations presented in Table 2.2 were interpreted by Headey and Wearing as an indicator of moderate stability in SWB over time. An additional analysis was conducted by the authors to further investigate the stability in SWB over time. In this analysis, Headey and Wearing computed the percentage of individuals whose SWB scores changed by more than one standard deviation. Results indicated, in the two years from 1981 to 1983, 18% of respondent's scores on life satisfaction changed by more than one standard deviation. By 1989, eight years after the initial measurement, 27% of respondents' scores on LS changed by more than one standard deviation. For positive affect, 28% to 33% of respondents scores changed by more than one standard deviation. Negative affect exhibited a similar pattern to PA, with 25% to 28% of respondents reporting change in NA of more than one standard deviation. On the basis of these results, in combination with the moderate over-time correlations, Headey and Wearing proposed that each individual has an equilibrium level of SWB which is principally determined by stable personality characteristics; in particular, extroversion and neuroticism. However the basis for the proposal that SWB is stable over time has not been adequately demonstrated by the authors. An examination of standard deviations is required in order to demonstrate stability. Specifically, if SWB within people over time (i.e., from 1981 to 1989) changed less than SWB between people at any one time point, then it would have been possible to conclude SWB was stable. However this analysis was not conducted by the authors and the standard deviations required to conduct this analysis were not provided. As such, the premise on which Headey and Wearing's equilibrium model of SWB rests cannot be validated.

To support the proposition that personality is the principal determinant of an equilibrium level of SWB, Headey and Wearing (1989, 1992) analysed whether extroversion and neuroticism, measured in 1981, could predict LS, PA, and NA measured up to eight years later. The authors found that extroversion and neuroticism significantly predicted LS, PA, and NA in 1983, 1985, 1987, and 1989. The variance accounted for by extroversion and neuroticism ranged from a minimum of 17% (predicting PA in 1989), to a maximum of 49% (predicting NA in 1983). The average variance accounted for by extroversion and neuroticism in LS was 32%, in PA 22%, and in NA 42%. The authors interpreted these results as support for their hypothesis that SWB is stable around an individual set-point, and that personality strongly determines the set-point level.

Headey and Wearing (1989, 1992) then attempted to understand change in SWB and distress by investigating the impact of life events. The unique contribution of such life events was assessed in a hierarchical regression in which personality was entered at step 1 and life events were entered in step 2. Whilst extroversion and neuroticism accounted for 35% of variance in LS, 31% in PA, and 49% in NA, at step 2 life events accounted for an additional 7% variance in LS, 16% in PA, and 10% in NA. Thus, life events predicted LS, PA, and NA after controlling for extroversion and neuroticism. This result, in combination with the previous results, led the researchers to propose that personality, life events, SWB, and psychological distress are in dynamic equilibrium (Headey & Wearing, 1992). Personality plays a central role in this theory. It is hypothesised to strongly influence the set-point of SWB, in addition to predicting an individual's equilibrium level of favourable and adverse life events. Change in SWB is hypothesised to be caused by deviations from the equilibrium level of life events. That

is, a major negative or positive life event that is not part of the normal pattern of life events causes SWB to increase or decrease beyond its equilibrium level. Headey and Wearing propose that such changes in SWB are only temporary, as stable personality characteristics ensure that the individual is returned to his or her normal equilibrium level of SWB.

Headey and Wearing's (1992) longitudinal data provide an insight into the nature of SWB and psychological distress beyond that which cross-sectional research can establish. Following from their analyses, Headey and Wearing proposed that individuals have a stable, equilibrium level of SWB. The stability in this equilibrium level of SWB is hypothesised to be due to extroversion and neuroticism. However, as mentioned previously, Headey and Wearing have not adequately demonstrated stability in SWB. This limits the utility of the theory. In addition, Headey and Wearing found that extroversion and neuroticism could only account for an average of 32% variance in life satisfaction over time, leaving 68% unaccounted for. Other research, reviewed earlier, often reported stronger correlations between life satisfaction and self-esteem, optimism, and perceived control (Compton, 2000; Cummins & Nistico, 2002; DeNeve & Cooper, 1998; Diener & M. Diener, 1995; Lucas et al., 1996). These findings, interpreted together with previous research finding inconsistent or weak correlations between personality and life satisfaction (DeNeve & Cooper, 1998; Emmons & Diener, 1985; Zheng et al., 2004) further limits the utility of Headey and Wearing's theory. Thus the search for a more comprehensive theory of SWB, incorporating other, potentially stronger influences on SWB, must be made.

## *2.2 Cummins Homeostatic Model of Subjective Wellbeing*

The search for a more complete theory of SWB has led to development of the homeostatic theory of SWB by Cummins (1995). Specifically, Cummins built upon the idea that SWB is maintained within a narrow range, however, extended Headey and Wearing's (1992) equilibrium idea further by incorporating the variables that relate to satisfaction with the self (self-esteem, optimism, and perceived control), in addition to the personality dimensions of extroversion and neuroticism. As such, the homeostatic theory of SWB represents an important theoretical advancement in the field, and warrants a detailed examination in order to determine the utility of this theory.

Cummins (1995) began his research following evidence that a majority of people report life satisfaction above the mid-point of scales (Headey & Wearing, 1989, 1992). That is, most people report feeling satisfied with their lives. Cummins proposed that if this phenomenon were evident across studies in different populations, then the operation of a psychological set-point for SWB may be the cause. Cummins set out to test this hypothesis by conducting an analysis of the distribution of life satisfaction data in published quality of life research. Cummins restricted the analysis to data from Western countries. These studies were then subjected to strict criteria for inclusion. To be included in the final analysis, studies had to have implemented symmetric Likert scales measuring satisfaction either globally or through domains from which mean scores could be derived. Scales measuring happiness were excluded. In addition, studies had to: (a) originate from countries comparable on culture and socio-economic status, (b) include participants between the ages of 17 and 65, and (c) exceed a sample size of 200. Seventeen studies fulfilled these criteria. These studies comprised data from

England, USA, Australia, Norway, and Canada. For comparability, scores on each study were converted to a common statistic, Percentage of Scale Maximum (%SM), which converts any response on a Likert-type scale to a common metric that can range from 0 to 100% (see Equation 2.1).

$$\%SM = \frac{x - k^{Min}}{k^{Max} - k^{Min}} \times 100 \quad (\text{Eqn 2.1})$$

where  $x$  = the score to be converted

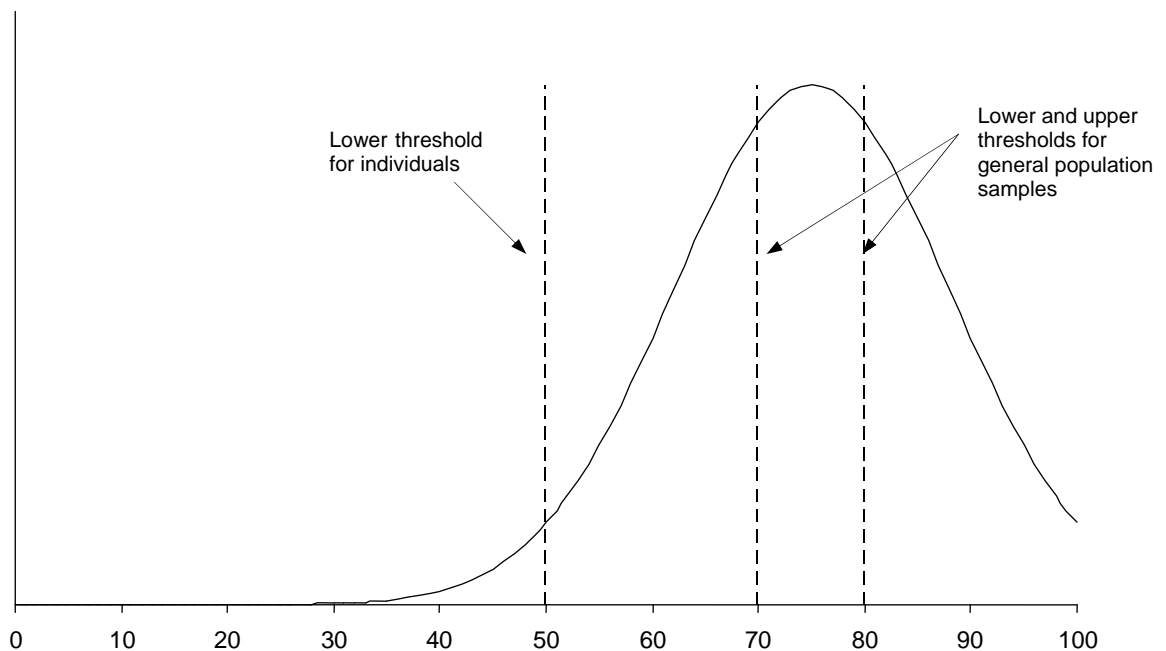
where  $k^{Min}$  = the minimum score possible on the scale

where  $k^{Max}$  = the maximum score possible on the scale

Application of this formula by Cummins (1995) to the 17 studies gave a mean of 75%SM ( $SD=2.5$ ). Thus, consistent with Headey and Wearing (1989, 1992), a majority of people reported themselves to be three-quarters satisfied with their lives. Cummins argued that this finding was evidence of the operation of a homeostatic mechanism by which life satisfaction is maintained around 75%SM. Such a mechanism is argued by Cummins to be highly adaptive, as it ensures that individuals, despite relatively stable but diverse living conditions, maintain a high level of satisfaction with their lives. However, this mechanism applies only on an averaged basis across populations and, as the investigation of population sub-groups by Cummins revealed, some groups fell outside the normal range (arbitrarily defined as two standard deviations from the mean). Cummins' homeostasis hypothesis is further supported when consideration is made of the diversity of the studies. Fourteen different scales of life satisfaction were used in the 17 studies, with little commonality in the methodology. In addition, all studies were linked only to the extent that they enquired about life satisfaction. Yet despite this diversity in methodology, mean life satisfaction was found to be remarkably similar



across studies. Cummins thus proposed that the %SM score of  $75 \pm 2.5$  may represent a ‘gold standard’ of life satisfaction (see Figure 2.1).



*Figure 2.1: Schematic description of distribution of life satisfaction scores. Adapted from “A model of subjective wellbeing homeostasis: the role of personality”, by R.A. Cummins et al., 2002, in “The universality of subjective wellbeing indicators: a multi-disciplinary and multi-national perspective” (Eds. E. Gullone & R. Cummins) p. 10. Copyright 2002 by Kluwer Academic Publishers. Adapted with permission.*

A follow up to this study by the same author (Cummins, 1998) extended the research to examine whether the  $75 \pm 2.5$  statistic applied to other non-Western, non-English speaking countries. A similar literature search and inclusion criteria employed in the previous study (Cummins, 1995) was utilised again for the current study. Forty five different nations were represented, and using the %SM conversion, Cummins (1998) found that international life satisfaction scores could be approximated by  $70 \pm 5\%$ SM. Presuming two standard deviations define the normal range, considerable overlap occurs between the Western range, 70 to 80%SM and the global range, 60 to 80%SM. The Western range is entirely contained within the global range. Such floor and ceiling

effects further support the proposition that a homeostatic mechanism maintains SWB within a positive range. In addition, despite diverse living conditions, the average level of life satisfaction across a disparate range of Western and non-Western countries varied within a range of only 20% (Cummins, 2003). Consistent with these results, recent research has found mean life satisfaction scores in non-English speaking samples of Spanish adults and adolescents to be contained within the 70 to 80%SM range (Casas & Coenders et al., 2007; Casas, Figuer, Gonzalez, & Malo, 2007).

An additional investigation of normative life satisfaction was undertaken by Cummins (2003) in an examination of the distribution of life satisfaction data within populations. A similar methodology that had been implemented in previous research by Cummins (1995, 1998) was used, yielding within population data from 62 studies across 23 Western and non-Western countries. Results supported the previous finding of a global standard for life satisfaction scores, with means ranging from 58%SM to 82%SM. This study differed from previous research by Cummins (1995, 1998) as an analysis of intra-population variance was undertaken. Cummins (2003) found that population means above 70%SM were directly and systematically related to their standard deviations. As mean values approached and were greater than 70%SM, the distribution of data became increasingly leptokurtic, therefore having lower variance. Conversely, as means fell below 70%SM, the distribution became increasingly platykurtic, with a corresponding increase in variance. These results led Cummins to propose that life satisfaction is not free to vary over its theoretical range; it is maintained within a narrow range of positive values through the operation of a homeostatic mechanism. However a systematic increase in variance for values above the upper threshold is also needed to demonstrate evidence for the operation of a homeostatic mechanism. This test was not

able to be performed on the data in Cummins (2003) as intra-population life satisfaction scores did not exceed 75%SM.

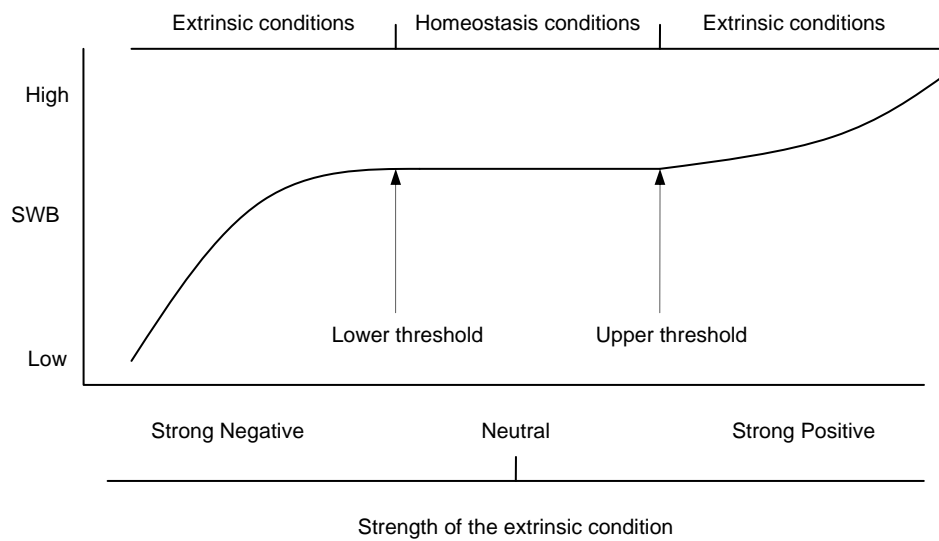
### *2.2.1 Internal Buffers and Control of Subjective Wellbeing*

The finding that life satisfaction is maintained within a positive range led Cummins (2003) to propose that life satisfaction may be held under homeostatic control in an analogous manner to other homeostatic systems such as blood pressure. In a search to understand how this occurs, Cummins hypothesised that devices maintaining homeostasis may be found within cognitive schemata. For instance, optimism (sense that tomorrow will be better than today), perceived control (sense of control over one's environment), and worthiness (that the self is decent and praiseworthy) may act to maintain a positive worldview, thereby generating positive SWB. These variables were eventually integrated into a theoretical model of SWB, which is discussed in detail below.

In the homeostatic model of SWB developed by Cummins et al. (2002), each individual is proposed to have an internal set-point for their normal level of SWB, where SWB oscillates within a narrow range. The basic operation of the homeostatic mechanism works by resisting change to SWB at the upper and lower thresholds, and, if such thresholds are exceeded, works to return SWB to its normal level. Evidence presented above provided partial support for this contention at the level of sample means, whereby a systematic increase in variance was found when values fell below 70%SM, the lower threshold for SWB (Cummins, 2003). However, as mentioned above, a systematic increase in variance for values above the upper threshold is also needed to demonstrate

the operation of a homeostatic mechanism. Stability in SWB is also proposed to be dependent on the operation of the homeostatic mechanism. For individuals who experience no major life event to disrupt homeostasis, their SWB will be stable and maintained around their set-point. However, individuals who experience a major life event sufficient to defeat the homeostatic mechanism will experience the least stability in SWB.

The notion that SWB depends on the severity of the challenging agent allowed a further prediction by Cummins et al. (2002) to be made. That is, SWB would be controlled by the homeostatic mechanism inside the upper and lower thresholds. When the strength of an extrinsic influence (conditions that are outside the homeostatic system) exceeded the capacity of the homeostatic system to adapt, SWB would respond to that extrinsic condition. For instance, a strong negative condition would lead to the lower threshold being exceeded, homeostasis defeated, and reduced SWB (Cummins et al., 2002; see Figure 2.2).

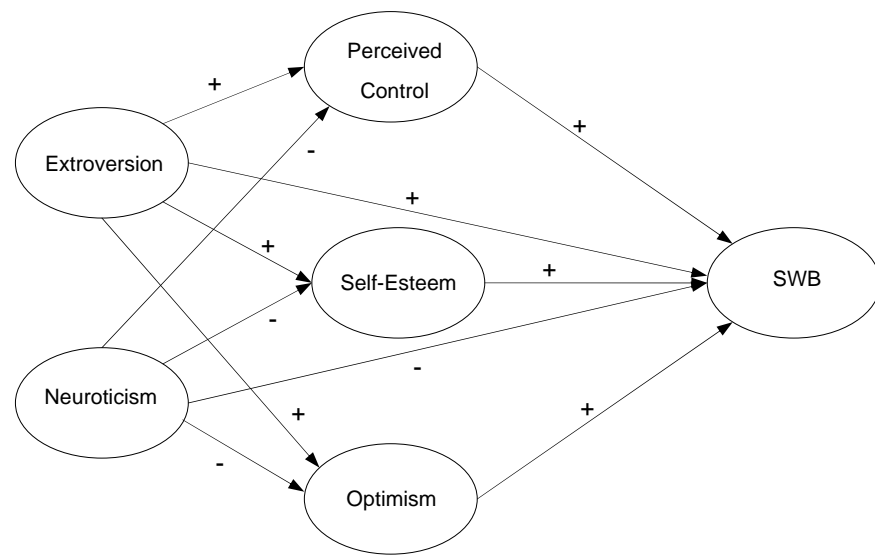


*Figure 2.2: Schematic description of control of Subjective wellbeing. Adapted from “A model of subjective wellbeing homeostasis: the role of personality”, by R.A. Cummins et al., 2002, in “The universality of subjective wellbeing indicators: a multi-disciplinary and multi-national perspective” (Eds. E. Gullone & R. Cummins) p. 13. Copyright 2002 by Kluwer Academic Publishers. Adapted with permission.*

Cummins et al. (2002) then turned toward identifying the psychological processes involved in the composition of such a homeostatic system. These authors began by noting that although personality had been proposed previously to be involved in the maintenance of a homeostatic system (Headey & Wearing, 1989, 1992), theorists had not attempted to explain the mechanisms by which personality is involved. A clarification of the homeostatic model was provided by R. A. Cummins (personal communication, March 10, 2006). In this homeostatic model, personality, operationalised as extroversion and neuroticism, influences SWB both directly and indirectly. The direct effect of extroversion on SWB is hypothesised to be positive, whereas the direct effect of neuroticism on SWB is hypothesised to be negative. The indirect effect of extroversion and neuroticism on SWB is mediated by a system of

‘cognitive buffers’ that act to absorb the impact of destabilising life events on SWB; events that could otherwise defeat the homeostatic maintenance of SWB. The cognitive buffers are comprised of the variables that have been found previously to relate strongly with SWB (Compton, 2000; Cummins & Nistico, 2002; Emmons & Diener, 1985; Lucas et al., 1996); self-esteem, optimism, and perceived control. Each of these variables are also hypothesised to directly and positively influence SWB.

In an attempt to provide further evidence for the direct and indirect effects of personality on SWB, Cummins et al. (2002) examined the correlations between extroversion, neuroticism, SWB, and two components of the buffer system; perceived control and self-esteem, across six studies. The authors found an average correlation of .32 between extroversion and SWB, and -.35 between neuroticism and SWB. Personality also correlated with both components of the buffer system, with an average correlation across four studies of .37 between extroversion and self-esteem, and .20 between extroversion and perceived control. Neuroticism correlated slightly higher with self-esteem (-.50) and perceived control (-.30). These findings, taken together with previous findings that self-esteem, optimism, and perceived control correlate moderately with SWB (Compton, 2000; Cummins & Nistico, 2002; Emmons & Diener, 1985; Lucas et al., 1996), provide some support for the proposition that SWB is influenced directly by personality and the buffer system, and indirectly by personality through the buffer system. The homeostatic model of SWB is given in Figure 2.3.



*Figure 2.3: Schematic description of homeostatic model of subjective wellbeing. A variable's hypothesised direction of influence is indicated by "+" or "-". These correspond to positive or negative hypothesised relationships respectively.*

The precise operation of extroversion, neuroticism, and the buffer system can be inferred from the homeostatic model provided in Figure 2.3. Specifically, for the direct effect, high extroversion relates to higher SWB. For the indirect effect, high extroversion relates with higher optimism, self-esteem, and perceived control, resulting in a stronger buffer system that is more likely to absorb the impact of life events that would otherwise result in homeostatic defeat of SWB. This in turn leads to higher, more stable SWB. In contrast, high neuroticism relates with lower SWB. For the indirect effect, high neuroticism relates with lower optimism, self-esteem, and perceived control, resulting in a weaker buffer system that is less able to absorb the shock of life events. This leads to a higher likelihood that SWB homeostasis would be defeated. Accordingly, individuals high on neuroticism are expected to have lower, and less stable SWB.

The positive relationship between high self-esteem, optimism, and perceived control was noted previously, however precisely how these variables influence SWB had not been elucidated. Cummins et al. (2002) and Cummins and Nistico (2002) attempted to rectify this by outlining how these variables might enhance or reduce SWB. Cummins et al. (2002) proposed that individuals high on self-esteem who evaluate themselves positively will demonstrate SWB resilience in the face of negative extrinsic conditions. Such resilience may be found in upward social comparisons following failure. For instance, an individual high on self-esteem may choose to believe that a person of similar or greater abilities would have also failed under the particular conditions, attributing their failure to the environment rather than to themselves (Cummins & Nistico, 2002). Conversely, those low in self-esteem may be more likely to interpret failures as a result of their own shortcomings, leading to higher anxiety and lower SWB.

High scores on the second component of the buffer system, optimism, have also been demonstrated to relate to increased positive affect and higher life satisfaction (Compton, 2000; Cummins & Nistico, 2002; Lucas et al., 1996). Optimism is proposed to exert its influence on SWB by reducing the impact of negative events on SWB such that an individual expects difficulties would not last, and that things would get better in the future. Extroversion would be expected to relate with relatively high levels of optimism to the extent they are both positive traits. Conversely, neuroticism would be expected to relate with low levels of optimism.

The final component of the buffer system, perceived control, relates to behaviour in which steps are taken to maximise good outcomes and/or minimise bad outcomes (Peterson, 1999). As discussed previously, a sense of personal control has been linked



to increased life satisfaction, whereas a lack of control has been linked to anxiety and lower life satisfaction. Perceived control is proposed by Cummins et al. (2002) to act in two ways. Firstly, under normal conditions, a person with a strong sense of control will believe that the environment is under their control, and attribute positive events to his or her actions. Secondly, when negative extrinsic conditions are experienced and must be endured, a person with a strong sense of control is likely to attribute such events to causes outside of his or her control. Conversely, a person low on perceived control is likely to attribute negative events to his or her actions which could lead to feelings of helplessness. However, Cummins et al. note that the capacity of this buffer will be exceeded by a strong and protracted negative life event. Extroversion is likely to be associated with a greater sense of perceived control due to the tendency for extroverts to report higher positive affect. Conversely, neuroticism would be expected to relate with a lack of perceived control due to the tendency for neurotics to experience greater negative affect.

In summary, a strong buffer system is likely to provide some protection against events (internal or external) that threaten SWB homeostasis, whereas a weak buffer system is more susceptible to homeostatic defeat. The above discussion also highlights the considerable overlap between the components of the buffer system (self-esteem, optimism, and perceived control), rendering it likely that these components are positively correlated. Indeed, over three separate samples, Lucas et al. (1996) found an average correlation between self-esteem and optimism of .64. However these authors also demonstrated that these two constructs were discriminable.

### *2.2.2 Summary of Homeostatic Model of SWB*

Empirical evidence conducted by Cummins (1995, 1998, 2003) supports the argument that life satisfaction is maintained around a stable set-point. In addition, the evidence reviewed supports the proposition that SWB is maintained homeostatically through the direct and indirect influences of extroversion, neuroticism, self-esteem, perceived control, and optimism. Thus, a number of predictions can be made based on Cummins et al.'s homeostatic model of SWB. That is: (a) SWB will be maintained homeostatically around an individual set-point, (b) this set-point is influenced directly by personality and the buffer system, specifically, extroversion, neuroticism, self-esteem, perceived control, and optimism, and (c) SWB is influenced indirectly by personality through the system of cognitive buffers.

These predictions have yet to be tested inside an empirical model, and as such, no conclusion can be drawn as to the efficacy of the homeostatic model proposed by Cummins et al. (2002). Research that specifies a structural equation model according to the above predictions could answer such questions of efficacy. In addition, if this model were subject to a direct comparison of alternative models of SWB that are supported by empirical evidence, then stronger conclusions may be drawn. Possible alternative theoretical models for such a test are provided by Michalos (1985), who proposes that SWB is the direct result of a series of perceived gaps in one's life, and Davern (2004), who proposes SWB is primarily determined by affect in combination with personality and cognitions. Adaptation-level theory also offers an alternative explanation of SWB, however empirical support for this model is weak.

### *2.3 Adaptation-level Theory of Subjective Wellbeing*

The homeostatic theory of SWB developed by Cummins et al. (2002) provides a comprehensive explanation of SWB by incorporating variables that have been empirically demonstrated to relate with SWB. However it is necessary to briefly discuss an alternative, but related, account of SWB, namely adaptation. In quality of life research, adaptation has been studied in response to major life events. Adaptation-level theory (Brickman & Campbell, 1971) proposes that individuals judge their current level of stimulation against whether such stimulation is higher or lower than that to which they are accustomed. If the level of stimulation is higher, the person experiences a change. However, over time, this new level of stimulation is incorporated into the 'accustomed' level, such that repeated exposure to this new level will exert considerably less influence. An upward shift is said to have occurred in the adaptation level. This process has been termed, the 'hedonic treadmill' as individuals must seek out new levels of stimulation to maintain old levels of subjective pleasure. However, adaptation-level theory provides a less comprehensive explanation of SWB than Cummins homeostatic theory. Specifically, in adaptation-level theory, only external events influence SWB. This explanation ignores personality and the large influence that cognitive variables such as self-esteem and optimism exert on SWB (Cummins & Nistico, 2002). In addition, adaptation-level theory does not provide a description of how adaptation is measured or how strong the stimulus must be to cause a shift in SWB. Further, the proposal of an adaptive mechanism that drives SWB is analogous to the proposal of a homeostatic system. However the proposal of the adaptive mechanism ignores other, recognised internal components (such as self-esteem, optimism, and perceived control) that relate strongly with SWB (Cummins & Nistico). In comparison

to adaptation-level theory, Cummins homeostatic theory not only incorporates both external events and internal, cognitive variables, but also explicates the operation of a mechanism that maintains homeostasis within a positive range. Thus the adaptation theory of SWB is a poor explanation of SWB and will not be considered further.

#### *2.4 Gap Theory Approach to Subjective Wellbeing*

The gap theory approach represents an alternative, empirically supported (Michalos, 1985) explanation of SWB. According to this theory, SWB is thought to result from 'gaps' or perceived differences between an individual's aspirations or goals and what they have currently achieved (Andrews & Robinson, 1991). Smaller gaps between aspiration levels and achieved levels result in higher SWB, whereas large gaps result in lower SWB. A comprehensive gap model of SWB was developed by Michalos (1985, Multiple Discrepancies Theory; MDT) and is regarded by some researchers to be one of the most elegant and thoroughly articulated gap theories of life satisfaction (Andrews & Robinson, 1991; Cummins, 1997; Lance, Mallard, & Michalos, 1995). MDT provides an alternative theoretical approach to SWB than the approach given by the homeostatic theories of Headey and Wearing (1989, 1992) and Cummins et al. (2002). This alternative approach allows contrasts between the theories to be made, thereby helping to determine the utility of either theory. Before any direct tests of the two theories it is necessary to firstly elaborate on, and examine in detail, the mechanisms of MDT and the evidence supporting the theory.

### *2.4.1 Michalos' Multiple Discrepancies Theory*

Michalos (1985) began from the premise that humans are motivated to pursue and maintain satisfaction in proportion to perceived expected levels of satisfaction. The idea is not new. Michalos notes that one of the central hypotheses of MDT, that satisfaction results from the gap between what one has and wants, is rooted in the Stoic philosophy of Zeno of Citium (300 B.C.). Michalos views SWB as resulting from evaluations of the present self in relation to multiple standards of comparisons. These comparisons form the core of MDT. Thus SWB, formally hypothesised by Michalos, results from perceived gaps between, 1. what one has and wants (self-wants); 2. what relevant others have (self-other); 3. the best one has had in the past (self-best); 4. what one expected to have now, 3 years ago (self-progress); 5. what one expects to have in five years (self-future); 6. what one deserves (self-deserves) and; 7. what one needs (self-needs). Each discrepancy was developed based on a diverse set of empirical and theoretical evidence. For instance, as mentioned previously the discrepancy between what one has and wants is rooted in Stoic philosophy. The self-other and self-best discrepancies are related to social comparison theory (comparisons with relevant others, and with the past self), whilst the self-deserves discrepancy is supported by equity theory (that each person receives whatever is due to him or her, as opposed to a distribution in which each person receives the same as every other person). The discrepancy between what one has and expects to have is rooted in Festinger's theory of cognitive dissonance (the difference between actual and expected outcomes; Festinger & Carlsmith, 1959). The self-future discrepancy relates with optimism about the future, whilst person-environment fit theory informs the self-needs discrepancy (i.e., the fit between a person's resources and what they need). Of these perceived discrepancies, Michalos

(1985), based on previous research (Michalos, 1980, 1982, 1983), hypothesised the self-wants discrepancy as the most influential, and the mediating variable between all other perceived discrepancies and overall life satisfaction.

To test whether MDT could explain variance in SWB, Michalos utilised a convenience sample of 682 University undergraduate students. The sample comprised 46% males and 54% females, with 70% of the sample aged between 20 and 25 years. Individuals completed a demographic questionnaire containing questions regarding marital status, work status, formal education, and major studies. Satisfaction with life as a whole was measured using two different questions. The first question asked, “Considering your life as a whole, would you describe it as very unhappy (=1), unhappy (=2 or 3), mixed (=4), happy (=5 or 6), or very happy (=7)?” (p. 360). It is important to note at this point that this conceptualisation of life satisfaction differs from the way in which life satisfaction is measured in the majority of the quality of life literature. That is, global life satisfaction is usually asked by some variant on the question, “How satisfied are you with your life as a whole?” Measuring life satisfaction using happiness raises issues about the connotations associated with the term “happy” that may bias an individual’s response. For instance, Diener (1984) notes that most societies would consider being happy as normative, and thus may report themselves as so regardless of their individual experiences. Using the term ‘happy’ in the question itself could also prime the individual to report a positive response. In addition, happiness and satisfaction are not one and the same; an individual may be satisfied without being happy, and vice versa. Nevertheless, applying the %SM conversion to the happiness data of Michalos yields a score of 66.67%. This score is similar to the normative score for life satisfaction in student data across countries as measured by Diener and M. Diener (1995). In the study

conducted by Diener and M. Diener, the authors examined cross-cultural correlates of life satisfaction in 13,118 college students across 31 countries. The mean overall life satisfaction, converted to %SM, was 61.56. When only western populations were taken into account, the USA mean was 71.67, whilst for both Canada and New Zealand, mean life satisfaction was 68.33.

In addition to the happiness measure of life satisfaction, Michalos (1985) also included the more common conceptualisation of global life satisfaction in his research, asking individuals, “How do you feel about your life as a whole right now?” Responses were made using a revised 7-point Likert-type delightful-terrible scale. Response categories ranged from “terrible” (=1), “mixed dissatisfying and satisfying” (=4), to “delightful” (=7). This question yielded the same mean as the happiness question (66.67%SM). Thus, posing a more valid measure of life satisfaction seemed to make no difference in the reporting of global satisfaction in this sample. It may be that for these particular college students, the term ‘happy’ had no inherent bias. Alternatively, it may be that these particular students considered the terms happy and satisfaction as equivalent: being satisfied with life may have been seen as synonymous with being happy.

Individuals in Michalos’ (1985) research also made satisfaction ratings for 12 life domains. These domains included; health, financial security, family relations, paid employment, friendships, housing, area lived in, recreation, religion, self-esteem, transportation, and education. Following domain satisfaction ratings, individuals made assessments according to each of the discrepancy hypotheses. The first discrepancy, self-wants, asked individuals to consider how their life as a whole (or relevant domain) compared to their general aspirations or what they wanted. The self-other discrepancy

asked individuals to compare how their life measured up against the average for most people that were of a similar age and geographic location. The self-best discrepancy asked individuals to consider how their life as it is now, measured up against the best they have experienced in the past. For the self-progress discrepancy, individuals were asked, “Compared to what you expected to have 3 years ago at this point in life, does your life offer extremely less, about what you expected, or extremely more?” Similarly, the self-future discrepancy asked individuals to, “Consider how you would rate your own life, as it is at present, in comparison to what you expect it will be five years from now.” For the self-deserves discrepancy, individuals compared their own life to the life they thought they deserved. For the self-needs discrepancy, individuals were asked to consider how their life measured up to what they thought they needed.

The results for these discrepancy ratings indicated the highest discrepancy across the 12 domains to be between what one has and what one needs ( $M=3.6$ ; lower values indicate larger discrepancies). The lowest discrepancies across the twelve domains were for what one has and wants ( $M=4.7$ ) and what one has compared with relevant others ( $M=4.7$ ). The domain of health elicited the highest satisfaction rating (5.3), whilst the domain of paid employment elicited the lowest satisfaction rating (3.7). Michalos (1985) then used the eleven domains, the six demographic variables, and self-esteem to predict global life satisfaction. This regression resulted in 53% of variance in global satisfaction scores to be accounted for by eight life domains and self-esteem. The remaining three domains of area lived in, religion, and transportation did not significantly predict global life satisfaction. The demographic variables were found to exert no effect on global life satisfaction as the significance levels of the demographic variables were too low to be entered into the regression equation. Satisfaction with self-esteem was the strongest



predictor of global life satisfaction ( $\beta=.31$ ), followed by satisfaction with friendships ( $\beta=.17$ ). The weakest predictor of global satisfaction was satisfaction with paid employment ( $\beta=.09$ ).

Happiness with life as a whole was then predicted by the eleven domains, six demographic variables, and self-esteem. Results indicated 39% of variance was explained in global happiness scores by five of the eleven domains and self-esteem. The six remaining domains of financial security, housing, area lived in, recreation, religion, and transportation, in addition to the six demographic variables, exerted no effect on global happiness scores. As with the global life satisfaction regression, self-esteem ( $\beta=.26$ ) and satisfaction with friendships were the two strongest predictors of global happiness ( $\beta=.21$ ).

The results of the two regressions provide further support for the role of self-esteem in predicting life satisfaction. Self-esteem was found to be the strongest predictor of both global life satisfaction and global happiness. This finding is consistent with previous research that has found self-esteem and life satisfaction to be highly related (Compton, 2000; Cummins & Nistico, 2002). The finding that demographic variables had no effect on global satisfaction or global happiness scores remains somewhat surprising, but is consistent with previous research that has found little variance explained in SWB by such demographic variables (Andrews & Withey, 1976; Campbell et al., 1976).

Following the regressions for life domains and demographic variables, Michalos (1985) tested the predictions of MDT. The set of perceived discrepancies, demographic variables (age, sex, work status, education), self-esteem, and social support were found

to predict 53% of variance in global life satisfaction. However the strongest predictors were not any of the perceived discrepancies, but were social support ( $\beta=.28$ ) and self-esteem ( $\beta=.28$ ). Similarly, when the set of perceived discrepancies, demographic variables, self-esteem, and social support were used to predict global happiness, social support ( $\beta=.24$ ) and self-esteem ( $\beta=.18$ ) were the first and third strongest predictors. Together, these variables accounted for 49% of variance in global happiness. Interestingly, only 10% more variance was accounted for by the combination of the perceived discrepancies, self-esteem, social support, and demographics compared to the variance accounted for by the combination of life domains and self-esteem (39%). Similarly, the combination of perceived discrepancies, demographics, self-esteem, and social support accounted for the same amount of variance in global life satisfaction as satisfaction with eight life domains and self-esteem (53%).

Michalos (1985) then analysed which of the discrepancy variables exerted the greatest influence on satisfaction scores in a series of multiple regressions. Using all seven discrepancy variables as predictors, and domain (or global) satisfaction (or happiness) as the criteria, the self-wants discrepancy had the highest beta value 38 times. On this basis, Michalos concluded that the self-wants discrepancy was the most influential. The second strongest discrepancy variable was the discrepancy between what one has and relevant others have (self-other).

Overall Michalos (1985) found that the set of perceived discrepancies accounted for a large proportion of variance in global life satisfaction and global happiness scores. However, the strongest predictors of both global happiness and global life satisfaction were not any of the perceived discrepancy variables, but social support and self-esteem.

Thus, although Michalos' (1985) research provides some support for the hypothesis that SWB is arrived at via judgements of perceived gaps, it also strongly supports the role that cognitive variables, such as self-esteem and social support, have in influencing judgements of SWB. As such, any model of SWB should take into account the role of cognitive variables in influencing life satisfaction judgments.

An additional empirical analysis of MDT was conducted by Staats, Armstrong-Stassen, and Partilo (1995). Staats et al., using the same methodology as Michalos (1985), tested 708 college students from the USA and Canada in 1985 and again in 1992. Mean satisfaction and happiness scores averaged 5.17 across samples and time frames. Converting this statistic to %SM yields satisfaction and happiness scores of 69.5%: a finding consistent with Michalos (1985) and previous research for normative levels of satisfaction within student populations (Diener & M. Diener, 1995). The predictions of MDT were tested via a path analysis with global life satisfaction as the dependent variable. This analysis resulted in 39% of the variance in life satisfaction accounted for by the set of perceived discrepancies. Consistent with Michalos' (1985) hypothesis, the self-wants discrepancy exerted the greatest influence on life satisfaction ( $\beta=.37$ ), followed by self-esteem ( $\beta=.17$ ). When the measure of SWB was global happiness, the path analysis accounted for 45% variance, with self-esteem exerting the greatest influence on happiness ( $\beta=.25$ ), followed by the self-wants discrepancy ( $\beta=.22$ ). Social support was also found to directly and significantly influence global happiness ( $\beta=.16$ ). This additional empirical analysis of MDT provides further support that any theory of SWB should include some form of cognitive variables, as self-esteem and social support have been consistently found to strongly relate to judgements of SWB (Cummins & Nistico, 2002; Diener & M. Diener, 1995; Michalos, 1985). The research of Staats et al.

provides moderate support for the prediction of MDT that perceived discrepancies influence SWB.

MDT was also subjected to empirical investigation by Lance et al. (1995) who tested the relationship between satisfaction with life domains and global satisfaction. The sample comprised 1,354 students from the United States of America. The methodology replicated that of Michalos (1985) with the exception that only the self-wants discrepancy was measured. Empirical research has demonstrated the self-wants discrepancy to be the most influential of the perceived discrepancies (Michalos, 1985; Staats et al., 1995). The self-wants discrepancy was measured by asking participants to consider, “your present life in comparison to your wants or aspirations. Now rate your own life right now in terms of your life approaching what you want.” Response categories ranged from 1 (not at all), through 4 (half as well as what you want) to 7 (matches or is better than what you want). A model was constructed that specified the effect of the self-wants discrepancy for overall life satisfaction and each life domain. The direct effect of the self-wants discrepancy on overall life satisfaction was significant ( $\beta=.41$ ;  $R^2$  and  $sr^2$  not provided). Similarly, self-wants significantly influenced each domain, with beta weights ranging between .45 for education to .75 for partner (*mean*  $\beta=.62$ ). Based on these results, Lance et al. concluded that one of the central tenets of MDT, that the self-wants discrepancy is an immediate and major determinant of SWB, had been strongly supported by the empirical data. However this conclusion is not warranted as the other perceived discrepancies were not measured, therefore their effects on SWB could not be compared with the effects of self-wants on SWB.

Overall, the picture emerging from these three empirical investigations of MDT is that the perceived discrepancy between what one has and what one wants is a strong predictor of SWB, though not stronger than an individual's judgement of social support or self-esteem. In addition, MDT seems to account for a moderate to large proportion of variance in global satisfaction and global happiness scores (39% to 53%). However this finding is not as impressive when consideration is made of the fact that MDT, in Michalos' (1985) research, predicted no more variance than satisfaction with nine life domains. When global happiness was the measure, MDT predicted only 10% more variance than domain satisfaction.

MDT represents an alternative theoretical model of SWB to the homeostatic model provided by Cummins et al. (2002). However the research reviewed herein only finds moderate support for MDT. In spite of this, any conclusion as to which of MDT and homeostasis is the more efficacious theory cannot be made until an empirical analysis is conducted that compares the two theories directly.

### *2.5 The Affective-Cognitive Model of SWB*

Both homeostatic theory and MDT posit cognitions as the central, dominant influence of SWB. However other researchers have put forth an alternative position whereby SWB is primarily influenced by affect. Initially affect was proposed as a heuristic that individuals used when making judgements of LS, as it was thought that asking an individual to arrive at an overall judgement of life satisfaction across his or her life span required an excessive amount of cognitive effort (Schwarz & Strack, 1999). In addition, the abstract nature of the question made it even more likely that individuals would use

some form of heuristic in arriving at their LS judgement. Empirical evidence indirectly supported this hypothesis, as LS was found to be not only sensitive to fluctuations in mood (Forgas & Moylan, 1987), but also sensitive to environmental conditions (Schwarz et al., 1987), and even to the nature of the questions that preceded the LS question (Schwarz & Strack, 1999). Recent research conducted by Davern (2004) has suggested that affect might be more than just a heuristic. Specifically, Davern proposes that affect is strongly related to judgments of life satisfaction. This conclusion was reached after finding that five trait affect items accounted for 66% of variance in SWB. These five trait affects were happy, content, excited, satisfied, and discontent. Davern then specified and tested a model of SWB that incorporated Costa and McCrae's (1992) five factors of personality (extroversion, neuroticism, conscientiousness, agreeableness, openness to experience; combined to form a latent variable), multiple discrepancies theory, and the five trait affects. In this model the five trait affects were combined to form a single latent variable which was proposed to directly influence SWB, MDT, and the five factors of personality. MDT and personality were also hypothesised to directly influence SWB. A test of this model indicated the latent variable trait affect to be a powerful predictor of SWB ( $\beta=.88$   $p<.001$ ), MDT ( $\beta=.90$ ,  $p<.001$ ), and personality ( $\beta=.78$ ,  $p<.001$ ). In addition, the combination of the five trait affects accounted for 53% of the variance in MDT, and 61% of variance in personality. Having controlled for the effects of trait affect in this model, MDT ( $\beta=.15$ ,  $p=.05$ ) and personality ( $\beta=-.11$ ,  $p=.05$ ) were only weakly related to SWB. The model provided an adequate fit to the data ( $\chi^2=466.91$ ,  $p<.001$ ,  $\chi^2/df=2.2$ , RMSEA=.04, AIC=636.91) and explained a large amount of variance in SWB (88%). As these results suggest that trait affect is a powerful determinant of SWB, this affective-cognitive model will be considered as an alternative model to MDT and homeostatic theory.

## *2.6 Contrasting MDT, the Homeostatic Model, and Affective-Cognitive Theory*

There are some points of difference between the three theoretical models of SWB that must be borne out. Firstly, MDT hypothesises that a set of perceived discrepancies will directly influence SWB such that higher discrepancies will lead to lower SWB. In addition, MDT predicts personality, optimism, and perceived control exert no direct influence on SWB. By contrast homeostatic theory predicts that SWB is directly influenced by personality, and indirectly via self-esteem, optimism, and perceived control (the three components of the buffer system). In comparison, the affective-cognitive model proposes affect to directly influence SWB, as well as indirectly through personality and MDT.

In a test of these three theories, there are two specific findings that would indicate support for homeostatic theory over MDT and affective-cognitive theory. Such findings are: (a) that life satisfaction data will lie between 70 to 80% of scale maximum despite reports of large perceived discrepancies, and (b) that a structural equation model of SWB according to homeostatic theory will predict greater variance in SWB, and provide a better fit to the data, than a structural equation model of SWB specified according to MDT or affective-cognitive theory.

## *2.7 Conclusion*

This review began by noting that happiness is a fundamental part of human experience. For centuries philosophers have attempted to outline the nature and causes of happiness; however, it has only been in the last four decades that scientists have taken the study of

happiness, and more specifically, subjective quality of life, to be a legitimate area of enquiry. This coincided with the move in psychology away from an exclusive focus on ill-health, and towards an examination of how and why humans feel good. Such investigations led to the finding that most people report a level of life satisfaction above the mid-point of scales. Subsequently a search was undertaken to explain why a majority of people report themselves to be satisfied with their lives. This search led to the proposal that personality influences judgements of SWB. However empirical support for this proposition is mixed at best. Nevertheless, Headey and Wearing (1992) proposed a theoretical model of SWB in which personality provides an individual with his or her equilibrium level of SWB. Their argument was that personality acts to bring SWB back to equilibrium following events that change SWB above or below such an equilibrium point. However, as mentioned previously, personality is not a strong predictor of SWB. The search to explain the remaining unaccounted for variance in SWB led researchers to examine other cognitive variables, such as self-esteem, optimism, and perceived control. Each of these variables were found to correlate strongly with SWB (Compton, 2000; Cummins & Nistico, 2002). This finding, in conjunction with the finding that life satisfaction was maintained within a narrow range, led Cummins et al. (2002) to propose a homeostatic theory of SWB. In this theory, SWB is maintained around a set point through the operation of personality in conjunction with a cognitive buffer system, comprised of self-esteem, optimism, and perceived control. This system acts to absorb events or circumstances that have the capacity to threaten the maintenance of SWB. Conclusions as to the efficaciousness of this theory cannot be drawn until the theory has been subjected to an empirical test. Ideally such a test would involve the comparison of the homeostatic theory with alternative models of SWB that have empirical support. These alternative models are



MDT (Michalos, 1985), and affective-cognitive theory (Davern, 2004). According to MDT, SWB is a direct function of a set of perceived discrepancies. This model has been tested by Michalos and was found to account for a large amount of variance in SWB. However the strongest predictors of SWB were not any of the perceived discrepancies, but self-esteem and social support. Thus it may be that the homeostatic theory of SWB that encompasses cognitive variables such as self-esteem, provides a better explanation of SWB than MDT. The second alternative model of SWB, proposed by Davern, incorporates affect, MDT, and personality to the explanation of SWB. This affective-cognitive model was found to provide an adequate fit to the data whilst also accounting for a substantial amount of variance in SWB. A direct test of homeostatic theory, MDT, and affective-cognitive theory will allow conclusions to be drawn regarding the utility of either one of these models in explaining SWB.