

**Subjective Well-Being in Dentists and Dental Students:
The Role of Personality and Motivation**

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Liverpool for the degree of Doctor in Philosophy by**

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Abstract

A number of studies have examined high rates of stress and burnout in dentists and dental students. Informed by work in positive psychology, this thesis takes the view that mental health problems can be approached by understanding and improving positive states such as subjective well-being, which forms a buffer between the experience of strain and psychological ill health.

This thesis proposes that two recently-investigated personal resources, Core Self-Evaluations (CSE) and Trait Emotional Intelligence (trait EI) contribute to well-being in dental students and dental practitioners. Core self-evaluations (CSE) and trait Emotional intelligence represent dispositional self-evaluations about cognitive and emotional competencies and self-worth. Given that CSE and trait EI successfully predicted well-being measures in the health and organizational literature, it is of interest to study such effects in dentistry. The second aim of this thesis was to understand the mechanism behind the effects of personal resources by identifying mediating variables. Research indicates, that CSE and trait EI may exert their influence on well-being because they assist individuals to choose personal goals that match their intrinsic motives, interests and values. This dissertation provides an empirical test of this mediational hypothesis.

Three cross-sectional studies with self-report measures were employed. Study one examined relationships between CSE and Trait EI and subjective well being in a sample of dental students, whilst statistically controlling the effects of basic personality traits. Significant independent relations between CSE constructs and Trait EI and subjective well-being were found.

Using self-determination theory, two differing conceptualisations of intrinsically motivated goals were selected and measures pertaining to them were used to identify possible mediators of the CSE/Trait EI relationship. Study two examined whether the relation between CSE and Trait EI can be explained through a goal construct that focuses on underlying intrinsic motives of personal goals. Although the finding that CSE and Trait EI predicted subjective well-being was replicated, and intrinsic goals predicted subjective well-being, findings did not support the predicted mediation. Study three examined further whether the relation between CSE and Trait EI can be explained through a related goal construct that focuses on the intrinsic content of life goals. Again, findings did not support this mediation.

Results of these studies have theoretical implications for dental research as they indicate that personal resources can have predictive and incremental validity for dentist and dental students subjective (work) well-being. Findings further suggest that the effects of CSE and trait EI on well-being measures are not mediated through intrinsic forms of goal motivation.

The findings, however, are limited by cross-sectional designs and reliance on self-report data. Bearing these limitations in mind, it can be concluded that personal resources might play a role for dental students and dental practitioners subjective well-being. Given that positive mental health is personally and professionally of great relevance for dentists and dental students, it is sensible to consider evidence-based interventions to strengthen personal resources.

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Glossary

Note: Terms are presented in alphabetical order. Definitions were taken from several sources, including Preacher & Hayes (2008), Tabachnick & Fidell (2007), Field (2005), Pallent (2007).

Bootstrapping method: non-parametric resampling procedure most commonly used in mediation analysis.

Convergent validity: examines the extent to which a construct is similar to other theoretically related constructs.

Discriminant validity: examines the extent to which a construct is different from other constructs that it should not be related to.

Eigenvalue: represents the amount of total variance explained by a factor in a factor analysis.

Factor analysis: is used to reduce the number of variables, and to detect structure in the relationship between variables.

Incremental validity: the extent to which a measure makes a unique contribution to prediction over and above other core measures.

Mediation analysis: seeks to identify and explicate the mechanism that underlies an observed relationship between an independent variable (X) and a dependent variable (Y) via the inclusion of a third explanatory variable, known as a mediator variable.

Oblimin rotation: factors are allowed to correlate in a factor analysis.

Orthogonal rotation: factors are assumed to be statistically independent of each other.

Predictive validity: examines the extent to which a measure predicts future outcomes in another criterion.

Reliability: the extent to which a scale consistently reflects the construct it is measuring.

Validity: of a scale refers to the extent to which it measures what it is supposed to measure.

Abbreviations

AI: Aspiration Index

CSE: Core self-evaluations

CSES: Core self-evaluations scale

EI: Emotional intelligence

JIG: Job in general scale

JS: Job satisfaction

LS: Life satisfaction

NA: Negative Affect

PANAS: Positive and negative affect scale

PA: Positive Affect

PLOC: Perceived locus of causality

RAI: Relative Autonomy Index

SWB: Subjective well-being

SEIS: Schutte emotional intelligence scale

SWLS: Satisfaction with life scale

TEIQue: Trait emotional intelligence questionnaire

Trait EI: Trait emotional intelligence

1. Introduction

Compared to some other professions, routine dental practice involves isolation, demanding scheduling, heavy workloads, dealing with anxious and difficult patients and lower levels of professional support (Cooper et al., 1988; Freeman et al., 1995a, 1995b; Myers & Myers, 2004). Thus, some dentists experience high degrees of stress and poor health, and the physical and psychological health of dentists is lower to the general population (DiMateo et al., 1993; Underwood et al., 2003; Rada & Johnson-Leong, 2004; Myers & Myers, 2004; Puriene et al. 2007, Hill et al., 2010). Many of these factors are mirrored in dental training (Newbury-Birch et al., 2002; Polychronopoulou & Divaris, 2010). A recent longitudinal study has revealed increasing stress and burnout during dental school from first to fifth year (Gorter et al., 2008).

However, not all dentists and dental students show symptoms of strain and burnout (Humphris et al., 2002; Denton et al., 2008; Gorter & Freeman, 2011). One approach that has recently been used in the organisational psychology literature is to attempt to better understand the factors that confer resistance to stress, which can be used to develop preventive programmes. Subjective well-being (SWB) refers to individuals' subjective evaluations about their quality of life and happiness (Diener et al., 1999), and is known to buffer the adverse effects of stress on health in community samples (Folkman & Moskowitz, 2000; Schiffrin & Nelson, 2010; cf. Contrada & Baum, 2011). People with higher levels of SWB are particularly more likely to 'bounce back' from negative emotional experiences (Tugade & Fredrickson, 2004), show more adaptive functioning during chronic stress

(Pressman & Cohen, 2005) and display better physical and psychological health (Howell et al., 2007; Veenhoven, 2008).

Positive psychology involves a focus on constructs such as subjective well-being as an active contributor to positive mental health and complements approaches based on understanding and resolving pathology (Maddux, 2002; Duckworth et al., 2005). Positive psychology is often defined as the study of 'the conditions and processes that contribute to the flourishing of optimal functioning of people, groups, and institutions' (Gable & Haidt, 2005, p.104). As such, it can be understood as an overarching branch of psychology that focuses on positive psychological aspects that can potentially help people to maintain and enhance their mental health (Joseph & Wood, 2010).

A positive psychology approach has been applied to the work domain where it is often studied under labels such as 'work-well-being', 'organisational well-being', 'work engagement', 'positive organisational behaviour' or 'job satisfaction' (Warr, 1990; Cartwright & Cooper, 2009; Judge & Klinger, 2007; Luthans, 2002). Although there are fine differences between these concepts (cf. Cooper et al., 2009), they all share the idea that 'well-being' plays a central role in the maintenance of occupational health.

This approach has influenced dental research. Studies thus far have examined how certain aspects of the work environment (referred to as job resources) can help dentists to stay more engaged (cf. Job-Demand-Resources model, JD-R, Bakker & Demerouti, 2007). Such a work environment approach assumes that specific work related factors (such as patient contact, quality of care, autonomy) influence dentists job engagement (Gorter et al., 2006; Hakanen et al., 2008), which can buffer work stress and burnout (Brake et al., 2007). However, there has been little attention on individual factors or resources that contribute to dentists' well-being. Thus, it is of interest to develop an understanding of how individual factors (personal

resources) contribute to subjective well-being in dentists. Evidence from studies in work psychology suggest that personal resources can directly predict well-being indicators (Judge et al., 2004; Xanthopoulou et al., 2007; Xanthopoulou et al., 2009; Weigl et al., 2010). However, there is no equivalent research that shows this in dentistry.

The concept of 'personal resources' (or resiliency) refers to an emerging field of research that uncovers the positive effects of 'resourceful belief systems' on well-being (Semmer, 2006; Diener & Fujita, 1995; Hobfoll, 2002). Resourceful belief systems concern positive self-evaluations that people tend to make if they possess strong cognitive and emotional traits that are related to perceived control (e.g. self-efficacy, self-esteem). Individuals' positive self-evaluations contribute to SWB because they influence self-worth and adaptive functioning related to coping, goal striving, and achievement (Austin et al., 2005; Erez & Judge, 2001; Mikolajczek et al., 2008; Singh & Wood, 2008). As personal resources or positive self-evaluations have shown to play a crucial role in (work) well-being, this thesis aims to explore whether such claims also hold for dental students and dentists.

A useful operationalisation of personal resources is provided within Hobfoll's conservation of resources theory (COR: Hobfoll, 1989; 2002). Personal resources are in this theory specifically described as aspects of the self that 'pertain to individuals' sense of their ability to control and impact upon their environment successfully' (Hobfoll et al., 2003, p.632). Hobfoll (2002) and others (Luthans et al., 2006; Xanthopoulou et al., 2007) suggest that personal resources comprise of narrowly-defined personal traits.

1.1. Aims of the Present Thesis

The first aim of the current thesis is to test the capacity of two recently developed multi-dimensional self-evaluative personal resource constructs, 'Core Self-Evaluations' (CSE: Judge et al., 1997) and 'Trait Emotional Intelligence' (Petrides & Furnham, 2001) to predict well-being. Previous studies have linked CSE and trait EI with self-regulatory functioning and subjective well-being in the health and organisational psychology literature (Judge & Hurst, 2007; Van Rooy & Viswesvaran, 2004). Yet to date, no studies have explicitly explored subjective well-being or its potential predictors from a personal resource perspective in populations of dentists or dental students.

A second aim of this thesis is to advance and test the mediational hypothesis, whereby covariation between personal resources and SWB can be explained through self-regulatory processes related to the nature of goals¹ that dentists and dental students set and attempt to pursue. One broad theory that focuses on the nature or types of individuals' goals is the self-determination theory (SDT; Deci & Ryan, 2002). Self-determination theory posits that the underlying motive (the reason) and the content of personal goals are indicative of the extent to which individuals experience well-being (Deci & Ryan, 2000). SDT suggests more specifically that people experience the largest increase in well-being when they strive for goals that match their motives and further reflect intrinsic values of self-acceptance and

¹ In this thesis, goals are generally defined as cognitive representations of a possible state or outcome that an individual seeks to attain (Austin & Vancouver 1996). Furthermore, the term 'personal goals' is used throughout this thesis as a generic, inclusive equivalent for concepts focusing on self-set action-related endeavours such as personal projects (Little, 1993), personal strivings (Emmons, 1986), current concerns (Klinger, 1977). For the sake of the flow and clarity of argumentation, and because several authors have proposed that the various theoretical goal concepts are largely comparable on an empirical level (e.g. Riediger, 2007; Wiese, 2007), this thesis treats the goal concept as more or less equivalent. However, where the author thinks that a more precise definition could help to clarify some of these confusing and overlapping concepts, an additional definition is provided.

community. Given that goals with such intrinsic characteristics influence well-being positively, it is of interest whether expected effects of CSE and trait EI on subjective well-being can be explained through intrinsic forms of goal motivation.

2. Literature Review

In the next chapter a detailed literature review structured in five core parts is presented. *Part one* sets the stage for the thesis by introducing the theoretical background of mental health and providing a positive definition. In *part two*, evidence is presented how subjective well-being is associated with health and work outcomes. *Part three* takes a personal resources approach. It looks specifically at the role of core self-evaluations and trait emotional intelligence, and the impact of the two self-evaluative constructs on subjective well-being. *Part four* offers possible mediating mechanisms through which these positive effects unfold, advocating a motivational approach rooted in self-determination theory. Finally, in *part five*, subjective well-being is discussed within dentistry, and how similar concepts such as job engagement and job satisfaction have informed dental research. A chapter synthesis and a graphical outline of the main hypothesis concludes this literature review.

2.1. Mental health definitions

Historically, mental health and mental disorder were typically defined as opposite poles of a continuum. From that perspective, good mental health has been understood as a state characterised by the absence of mental disorder (Reisman, 1991; Wakefield, 1992). Mental disorder is defined by the American Psychiatric Association as ‘a *clinically significant*

behavioural or psychological syndrome or pattern that occurs in an individual and that is associated with present distress (ie a painful symptom) or disability (ie impairment in one or more important areas of functioning) or with a significantly increased risk of suffering, death, pain, disability or an important loss of freedom' (American Psychiatric Association, 1994).

However, an early challenge to this view was offered by Jahoda, (1958) who argued that mental health can not be fully defined solely 'by identifying it with the absence of disease' (Jahoda, 1958, p.14). Jahoda's and others criticisms (e.g. Maddux, 2002) of a negative and ill-focused approach towards mental health have sparked research that clearly shows that mental disorders and vulnerabilities represent only one part of the mental health spectrum (e.g. Keyes, 2005; Greenspoon & Saklofske, 2001; Ryff & Singer, 1998). The other part is increasingly recognised to be equally important, but related to positive human experiences of happiness and strength. This positive paradigm within mental health has often been studied under the term 'positive psychology' (Seligman & Csiksentmihalyi, 2000), 'positive clinical psychology' (Maddux et al., 2004), 'positive mental health' (Jahoda, 1958), and 'positive human health' (Ryff & Singer, 1998).

The identification of negative and positive aspects of mental health has consequently raised many questions particularly on the relation between the two seemingly opposing parts. Findings from empirical work seems to suggest that mental health (positive) and mental illness (negative) are two separate yet related constructs (Compton et al., 1996; Greenspoon & Saklofske, 2001; Masse et al., 1998; Suldo & Shaffer, 2008). Indeed, Keyes (2005) found in a nationally representative sample of the United States (based on data from MIDUS - Midlife in the United States Survey; N = 3,032) that mental health and mental illness formed distinct but negatively correlated constructs ($r = -0.53$). Overall, the study confirms especially

the assumption that mental health and mental illness are not opposite ends of a continuum, but rather, 'they constitute distinct but correlated axes that suggest that mental health should be viewed as a complete state' (Keyes, 2005, p.546).

With regard to mental health definitions, the focus has evidently shifted towards more positive attributes. Good examples of this trend are recent definitions from official national and international health guidelines. The UK Department of Health defines for example mental health as *'The emotional and spiritual resilience which enables enjoyment of life, and the ability to survive pain, disappointment and sadness; and as a positive sense of well-being and an underlying belief in our own and other's dignity and worth (Department of Health, 2001)*. Similarly, the World Health Organisation (WHO, 2005, p.2) defines mental health as *'a state of well-being in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community'*.

The aforementioned mental health definitions thus imply that a positive 'state' or 'sense' of well-being constitutes a key indicator and core part of positive mental health. This view is equally shared by many practitioners and researchers who define positive mental health predominantly in connection with well-being indicators (Compton et al., 1996; Keyes, 2005; Department of Health, 2001). For example, Keyes (Keyes, 2005; Westerhof & Keyes, 2010) operates with a positive mental health definition that incorporates only well-being indicators. Also the Department of Health (2001, p.27) defines in their mental health promotion strategies 'mental well-being' as their key target point for enhancing mental health.

2.2. Conceptualisation and measurement of subjective well-Being

With regard to this project, the construct of subjective well-being is used as the key measure of positive mental health. Defined as the analysis of individual's subjective evaluations of their lives (Pavot & Diener, 2004), subjective well-being is the most widely used scientific paradigm used to measure positive mental health (Diener, 1984; Diener et al., 1999). SWB researchers argue that good quality of life and everyday 'happiness' is mainly determined by *three components*: life satisfaction, the presence of positive affect, and the absence of negative affect (Diener, 1984; Diener et al., 1999). SWB is, thus, from a theoretical point of view composed of a cognitive (life satisfaction) and an affective (negative/positive affect) component. Ample empirical evidence from longitudinal, cross-sectional, and experimental studies associates all three SWB components with outcomes across life domains including health and work (e.g. Howell et al., 2007; Lyubomirsky et al., 2005; Bowling et al., 2010). The links between SWB and health/work are discussed in more detail in section (2.5 & 2.6).

2.2.1. Measurement of SWB

Three distinct components have been identified and used as measures to capture individual's judgements about their lives (Bradburn, 1969; Andrew & Withey, 1976; Diener, 1984). They are:

- a) Positive Affect (PA) reflects the amount of pleasant (e.g. joy, happiness) feelings that people experience in their lives in a time (Watson, 2000; Schimmack et al., 2008).

Positive affect also encapsulates the extent to which a person feels enthusiastic, active, alert, and in a state of full concentration and pleasurable engagement.

- b) Negative Affect (NA) is defined as the amount of unpleasant (e.g. sadness, guilt) feeling experienced. In other words, negative affect is a general feeling of subjective distress and unpleasurable engagement that subsumes a variety of negative mood states, including anger, contempt, disgust, guilt, fear, and nervousness (Watson et al., 1988; Watson, 2000; Bradburn, 1969)
- c) Life Satisfaction (LS) is the cognitive component of subjective well-being. It has received less attention in the literature than the affective component (Andrew & Withey, 1976; Diener et al., 1985). Life satisfaction is defined as the subjective assessment of the quality of one's life (Diener et al., 1985). It concerns the question 'what leads people to evaluate their lives in positive terms' (Diener, 1984, p.543).

Important evidence for the distinctiveness (convergent validity), independence (discriminant validity), and reliability (good alpha coefficient and test-retest stability) of all three components has been reported in numerous studies (Sandvik et al., 1993; Diener & Emmons, 1984; Lucas et al., 1996; Watson et al., 1999); and assessing these three major components separately in SWB studies is widely recommended by major authors in the field (e.g. Diener et al., 1999). Furthermore, the affective component and the cognitive component correlate positively with each other (Lucas et al., 1996; Schimmack et al., 2002).

2.2.1.1. Methodological issues

Early research has focused to a large extent on brief single-item self-reported evaluation; whereas more sophisticated multiple-item scales have been recently developed and validated. Schwartz and Strack (1999) list a number of problems with SWB measures, such as mood during scale administration, recall bias, order of items, type of scales and immediate context.

Advances have been made to overcome these methodological problems, particularly by implementing alternative instruments (Sandvik et al., 1993). A wide variety of different tools and assessment batteries are now available to SWB researcher, including, interviews, computer tasks, physiological and reaction-time measures (Pavot & Diener, 2004).

However, despite sophisticated multi-method instruments, major work in SWB research has commonly applied the 'one-time self-report' approach. These self-reports consist of single-item or multiple-item scales that typically asks respondents to reflect on how happy or satisfied they are or how happy they have been over a circumscribed period of time (Lucas & Diener, 2008). Two reasons can be identified as to why self-report questionnaires are generally favoured (Schimmack, 2007). Firstly, multi-method instruments are perceived as being costly and impractical and second, single methods (e.g. self-report questionnaire) display adequate psychometric properties to justify their applications (Larsen et al., 1985; Kahneman & Krueger, 2006).

2.3. Measurement of positive and negative affect

Although PA and NA are sometimes not strictly independent (see for a critical discussion, Russell & Carroll, 1999), most empirical research is broadly consistent that both can be considered as distinct constructs. Different measures have been proposed to capture these affective components of SWB. Among the most used inventories are the 'Affect Balance Scale' (Bradburn, 1969), the 'Positive and Negative Affect Scale' (PANAS: Watson et al.,

1988), and more recently, the 'Oxford Happiness Scale' (OHI: Argyle et al., 1989) and the 'Subjective Happiness Scale' (SHS: Lyubomirsky & Lepper, 1999).

2.3.1. The PANAS scales

The PANAS scales (Positive and Negative Affect Schedule), devised by Watson et al. (1988), represents one of the most commonly used measures in the affective literature. The PANAS was developed on the basis of a psychometric model of affect that postulates two independent factors.

The PANAS scale consists of 10 positive affects (interested, excited, strong, enthusiastic, proud, alert, inspired, determined, attentive, and active) and 10 negative affects (distressed, upset, guilty, scared, hostile, irritable, ashamed, nervous, jittery, and afraid). Participants are usually asked to rate items on a scale from 1 to 5, based on the strength of emotion (1 = 'very slightly or not at all', and 5 = 'extremely').

Initial studies in development of the PANAS have shown that the scales are stable at appropriate levels over a 2-month time period, highly internally consistent and largely uncorrelated. The coefficient alphas for NA scales ranged from 0.84 to 0.87, whereas those for positive affect ranged from 0.86 to 0.90 (Watson et al., 1988). These figures have been similarly reported in other studies with clinical and non-clinical population (Crawford & Henry, 2004; Ostir et al., 2005). In addition to adequate Cronbach alpha levels, the PANAS has stability over time. For example, Ostir et al. (2005) showed a test-retest reliability of 0.79

and 0.93 for positive and negative scales respectively over a three months period among rehabilitation patients.

Since its development, the measure has been employed for a wide range of purposes (Watson & Clark, 1997). Crawford and Henry (2004) have recently tested the reliability and validity of PANAS in a non-clinical population sample among 1003 UK general adults. The PANAS showed adequate psychometric properties in terms of validity and reliabilities (Cronbach's alpha were 0.89 for PA and 0.85 for NA). Thus, there is conclusive evidence to support the use of PANAS for affective components of SWB in a non-clinical population, as in the present study, for dental students and practitioners.

2.4. Measurement of life satisfaction

Life satisfaction is typically evaluated through self-report questionnaires (Pavot & Diener, 1993). Some inventories consist of a single question (Andrews & Withey, 1976), such as, 'How satisfied with your life are you overall?' whereas other measures require participants to respond to multiple-items (Diener et al., 1985). Overall, researchers agree that multi-item scales represent the first choice for measuring life satisfaction. This is particularly so, as Sousa and Lyubomirsky (2001) note, 'because only multi-item scales allow for the assessment of internal consistency, as well as the identification of errors associated with wording and measurement'. The most widely used and most well-validated measure of LS is the multi-item satisfaction with life scale (SWLS; Diener et al., 1985).

2.4.1. The satisfaction with life scale (SWLS)

The 5-item satisfaction with life scale (SWLS) was designed by Diener and colleagues (1985) to measure global life satisfaction. The instruction for the SWLS scale asks participants to rate five statements on 7-point Likert-type scale.

Because the authors consider life satisfaction as the cognitive component of SWB, they constructed this scale without reference to affect. The SWLS has been examined for both reliability and temporal stability. Diener et al. (1985) reported a coefficient alpha of 0.87 for the scale and a 2-month test-retest stability coefficient of 0.82. Lucas et al., (1996) further reported an adequate test-retest correlation of 0.77 over a four weeks period. The SWLS has been administered to many different groups of participants, including older adults, prisoners, abused women, students, and working adults as well as cross-culturally. In addition, correlations between life satisfaction and quality of life indicators have been reported (e.g. Fugle-Meyer et al., 2002; Rode, 2004). The scale has also demonstrated overall high internal consistency and reliability across gender, ethnicity, and age (Pavot & Diener, 1993).

Taken together, the PANAS and the SWLS have demonstrated to be excellent measures for affective and cognitive components of SWB, and for this reason they were both used as SWB outcomes in the present thesis.

2.5. Subjective well-being and health

There is growing evidence which suggests that subjective well-being is important in reducing the impact of stressors (Pressman & Cohen, 2005; Howell et al., 2007; Ryff et al., 2004; Veenhoven, 2008; Lyubomirsky et al., 2005; Chida & Steptoe, 2008). Numerous findings from cross-sectional (e.g. Veenhoven, 2006), longitudinal (e.g. Koivumaa-Honkanen et al., 2000), and experimental studies (e.g. Clark et al., 2001) using multiple biomarkers (neuroendocrine, immune, cardiovascular) and self-reported health measures (e.g. Boelhouwer & Stoop, 1999) substantiate the claim about the predictive power of SWB on health and longevity (cf. Diener & Chan, 2010).

Accordingly, both affective and cognitive well-being components have been reported to be positively associated with objective short term and long-term health outcomes (Pressman & Cohen, 2005; Ryff et al., 2004; Howell et al., 2007; Lyubomirsky et al., 2005; Chida & Steptoe, 2008). For example, results from a wealth of cross-sectional studies show correlations varying between +0.10 and +0.40 between well-being and physical health independent of age, gender, socio-economic status and personality (Veenhoven, 2008).

Longitudinal evidence in healthy, clinical, and student samples further support this link (Ostir et al., 2000; Koivumaa-Honkanen et al., 2002). For example Polk et al. (2005) showed that positive affect was associated with lower, and negative affect (both measured daily with 9 positive/negative mood adjectives each) with higher cortisol concentration (daily saliva sampling) over a three-week period in healthy adults (N = 334; aged 18-54 years).

The effects of positive affect on low cortisol and health outcomes can be better understood when considered in relation to other physiological parameters such as heart rate and blood pressures. For example, a 3 year follow-up study examined the interplay of these factors (Steptoe & Wardle, 2005). Based on data from middle-aged men and women (45-59 years old), it was found that positive affect associated with reduced salivary cortisol (hourly saliva sampling at Time 1 and 2), lower systolic blood pressure and stable heart rate measures after controlling for confounding variables (age, gender, grade of employment, Body Mass Index, General Health Score).

Cumulative findings from several reviews and meta-analysis further supports the protective role of subjective well-being (Lyubomirsky et al., 2005; Howell et al., 2007; Pressman & Cohen, 2005; Chida & Steptoe, 2008; Diener & Chan, 2010). For example, in two large meta-analyses of longitudinal and experimental studies (including healthy and mixed samples) effect sizes of 0.18 and 0.38 respectively were found between subjective well-being and health-relevant physiological outcomes (Lyubomirsky et al., 2005; Howell et al., 2007). Additional reviews by Pressman & Cohen (2005), Chida & Steptoe (2008), and Diener & Chan (2011) draw similar conclusions about the clear and compelling evidence for the influence of SWB on health and longevity particularly in normal population. Despite robust findings across diverse samples, there are also a few researchers that criticised the overstated role of well-being specifically with regard to claims about cancer patients (e.g. Coyne & Tennen, 2010).

In contrast to positive findings of a relation between SWB and health, there is less research available on potential pathways (Howell et al., 2007). For example, two interesting models are proposed by Pressman and Cohen (2005, pp. 957-959). A *direct effects model* in which well-being is supposed to directly affect health via behavioural (e.g. *health practice* like exercising regularly) or biological pathways (e.g. *immune functions* such as changes in

circulation of white blood cells). And a *stress-buffering model* in which well-being is supposed to ameliorate the effects of stressful events by increasing resiliency (more able to 'bounce back from negative emotional experience', cf. Tugade & Fredrickson, 2004), restorative activities (e.g. better sleep quality, cf. Steptoe et al., 2008) and enhancing coping responses (e.g. Folkman & Moskowitz, 2000). The lack, however, of robust evidence for either of these models limits the final conclusion that can be drawn from this research. What seems safer to infer is the fact that subjective well-being components associate significantly with different measures of health outcomes.

2.6. Subjective well-being and work

Traditionally, organisational research was dominated by the theory of stressor-strain perspective (Karasek, 1979). According to this approach, work performance and well-being are hindered by too much strain and stress that can lead in the long-term to mental exhaustion and burnout (Demerouti et al., 2001). More recent accounts in occupational research, however, emphasise the role of well-being and its link to core job outcomes and positive work behaviours (Brief & Weiss, 2002; Lyubomirsky et al., 2005; Zelenski et al., 2008; Wright & Staw, 1999; Cote, 1999; Wright & Cropanzano, 2000; Cropanzano & Wright, 2001; Harter et al., 2002; Luthans, 2002).

2.6.1. Effects of subjective well-being on work outcomes

Empirical data from cross-sectional and longitudinal studies suggests that well-being measures and job-related outcomes such as job performance, job satisfaction, job withdrawal, income, and task performance are significantly associated (Lybomirsky et al., 2005; Schulte & Vainio, 2010; Page & Vella-Brodrick, 2009; Kaplan et al., 2009). However, whereas some studies report strong relationships between SWB components and job outcomes, there are others which either show weak or non significant relationships (e.g. Laffaldano & Muchinsky, 1985; Wright & Staw, 1999). One reason for these incoherent results could be attributed to the fact that different measures were used to operationalise work related well-being (Brief & Weiss, 2002; Kaplan et al., 2009; Bindl & Parker, 2010). For example, some authors have used general, context-free well-being models (e.g. Wright & Cropanzano, 1998), whereas others applied more work specific well-being instruments (Daniell, 2000; Warr, 1990). More recent accounts suggest both work-related (e.g. job satisfaction) and general well-being (e.g. SWB) measures (Cotton & Hart, 2003; Page & Vella-Brodrick, 2009) are likely yield to more 'accurate assessments of employee well-being than when using SWB measures alone' (Page & Vella-Brodrick, 2009, p.446).

So far the clearest supportive findings were reported from studies that examined positive affect and its effect on work behaviour such as work performance (Wright & Cropanzano, 1999; Wright & Cropanzano, 2007), goal-directed behaviour (Ilies & Judge, 2005), pro-social behaviour (Belschak & Den Hartog, 2009), and job satisfaction (Judge & Ilies, 2004).

Within a clinical context, positive affect was also found to influence clinical decision making and practice satisfaction (Isen et al., 1991; Estrada et al., 1994; 1997). For example, in one

series of studies, medical students and practising physicians showed higher creativity (Estrada et al., 1998), improved performance on tasks related to medical diagnosis, and more open, flexible consideration of diagnostic alternatives (Isen et al., 1991).

Several plausible explanations have been proposed to explain the relation between positive affect and work outcomes. For example, some researchers argue that positive affect can broaden individual's momentary action-thought repertoire (Fredrickson, 1998; 2001; Isen, 2000). According to this theory, positive emotions broaden the scope of attention and heighten one's cognitive activities. This process encourages in turn a tendency to engage in generative, proactive behaviours (Fredrickson, 1998; Isen, 1999). In support of this, it has been shown, for example, that people with increased positive affect set higher and more challenging goals (Ilies & Judge, 2005). Other authors explain their results that happy people are high performers with the fact that they are less likely to show 'job withdrawal such as absenteeism, turnover, job burnout, and retaliatory behaviours' (Lyubomirsky et al., 2005, p.823). A third perspective attributes the effects of positive affect on core job outcomes to improved cognitive efficiency particularly when mood-congruent information are processed (Bower, 1981; Schwartz & Clore, 1983).

In summary, the reviewed findings in the work and health literature collectively suggest that subjective well-being not only significantly influences individuals' personal health, but also work related outcomes. Although the findings are robust, there is a need to better understand the underlying mechanism that connects SWB to outcomes such as health. Yet, to be able to capitalise on the existing findings about preventive effects of subjective well-being, it seems vital to understand first factors that affect subjective well-being. The focus therefore shifts to predictors of subjective well-being in the next section.

2.7. Personality and subjective well-being

Personality traits are consistent and powerful predictors of SWB (De Neeve & Cooper, 1998; Steel et al., 2008). Personality traits have been defined as ‘dynamic organisation, inside the person, of psychological systems that create a person’s characteristic patterns of behaviour, thoughts, and feelings’ (Carver & Scheier, 2000, p.5). Some authors distinguish further between *core traits* and *surface traits*¹ (Asendorpf & Van Aken, 2003; McCrae et al., 2000). *Core traits* are viewed from this perspective as stable, heritable traits with low sensitivity to environmental influence.

The ‘Big Five’ or ‘Five-Factor Model’ (cf. John & Srivastava, 1999) is the most influential and comprehensive model for understanding and organising *core personality traits* (McCrae et al., 2000). The model comprises the notion of five universal dimensions (neuroticism, extraversion, agreeableness, conscientiousness, and openness to experience) along which people vary and that capture important aspects of individual differences in personality (Roysamb, 2006).

Surface traits on the other hand are moulded by core traits but are also subject to environmental influences, providing structures whereby individuals adapt to environmental influences within parameters established by core personality (Asendorpf & Van Aken, 2003; Asendorpf & Denissen, 2006; Marsh et al., 2006). Surface traits are thus not completely distinctive from core traits, but carry a stronger environmental component and, therefore, are more malleable by environmental and life influences (Asendorpf & Van Aken, 2003). A good

¹ The terminology of ‘core’ and ‘surface’ traits is used by Asendorpf and Van Aken (2003). These terms are used for simplicity and are similar in meaning to those of ‘basic tendencies’ and ‘characteristic adaptations’ used by McCrae et al. (2000).

example of a surface trait is self-concept (Asendorpf & van Aken, 2003; Marsh et al., 2006). ‘The term *self-concept* refers to the totality of inferences that a person has made about himself or herself’ (Baumeister, 1997, p.681). Self-concept constructs are in particular argued to represent well surface traits because of their evidenced susceptibility to environmental influences (Asendorpf & Van Aken, 2003, Bandura, 1997; Baumeister, 1999). Furthermore, there is evidence that self-concept mediates the relation between core traits and behavioural outcomes (e.g. Greven et al., 2008; Strobel et al., 2011). Building now on the premise that *core self-evaluations* (CSE) and *trait emotional intelligence* (trait EI) represent theoretically (a) self-concept (Judge et al., 1998; Petrides, 2009) and (b) evaluative and emotional domains of the self that are under environmental influences, it seems reasonable to classify them as surface traits.

CSE and trait EI may also be conceptualised as personal resources. The personal resource approach (or resiliency)² refers generally to a research field that aims to understand how resources impacts people’s stress resistance, well-being, and work engagement (Diener & Fujita, 1995; Major et al., 1998; Hobfoll, 2002; Xanthopoulou et al., 2009). A commonly used definition of personal resources is provided by Hobfoll (2002, p.307) who defines them ‘as those entities that either are centrally valued in their own right (e.g. self-esteem, close attachments, health, and inner peace) or act as a means to obtain centrally valued ends (e.g. money, social support, and credit)’. Although different types of personal resources (social, material, personal characteristics) have been distinguished in the literature (e.g. Hobfoll, 1989, 2002), most of them comprise of narrowly defined traits that represent control and appraisal belief systems (Hobfoll, 2002; Semmer, 2006). As a result, more recent accounts of

² The term personal resource and personal resiliency are both interchangeable used in this thesis as they refer to similar meanings (cf. Major et al., 1998).

personal resources define them specifically as ‘positive self-evaluations that are linked to resiliency and refer to individuals’ sense of their ability to control and impact upon their environment successfully (Hobfoll et al., 2003, p.632; Xanthopoulou et al., 2009, p.236). This approach seems also to be in line with theoretical accounts in the personal resource literature (Major et al., 1998; Diener & Fujita, 2005; Semmer, 2006; Xanthopoulou et al., 2009).

In summary, the present thesis takes a personal resources approach using the surface traits of CSE and trait EI as presenting personal resources that are of relevance to dentists’ subjective well-being. Specifically, personal resources are considered to be relevant for dental students and clinicians as they influence not only personal well-being but also professional aspects³. The former point is particularly of relevance in this context as external factors (patients, health care team, and public policies) are highly likely to act upon dentist’s personal resources. The next sections will therefore review in more detail two personal resources: core self-evaluations and trait emotional intelligence.

2.8. Core self-evaluations

Judge and colleagues (1997) initially introduced the concept of core-self-evaluations (CSE) to explain how dispositional traits influence work well-being. Building on Packer’s work of ‘core evaluation’ (Packer, 1985), Judge and colleagues (Judge et al., 1997, 1998) focused specifically on broad personality traits with a self-evaluative element relating to capacity and

³ Dental professionalism in day-to-day practice has recently been defined to include the following values: integrity, compassion, altruism, continuous improvement, excellence, working in partnership with members of the wider healthcare team (Trathen & Gallagher, 2009, p.253).

personal control. Four personality variables were found to match this criterion including general self-efficacy, global self-esteem, locus of control, and emotional stability. As these four self-evaluative traits directly colour perceptions and attitudes of the 'self, reality (i.e. world), and other people' (Packer, 1985, p.3), they are considered to form a central part of the CSE construct (Johnson et al., 2008; Gardner & Pierce, 2009b).

Conceptually, Judge et al. (1997; 1998) combined four well established personality traits (locus of control, self-esteem, generalised self-efficacy and emotional stability), that were previously considered separately in the psychological literature, into an integrative theoretical framework called CSE. This step was justified based on claims that the four traits display high conceptual similarity and intercorrelations.

Two forms of evidence have been presented to support these claims. The first piece of evidence concerns data which shows high intercorrelations among the four traits (Judge et al., 1998; Judge et al., 2002). Of particular interest here are estimated, population level correlations between the four core self-evaluations traits presented in a meta-analysis conducted by Judge et al. (2002). As table 2.1 shows, the average population correlation among the four traits is $r = 0.60$ and thus, according to Judge and colleagues, 'sufficiently high convergence to warrant further investigation of their common core' (Judge et al., 2002, p. 696).

TABLE 2.1

Population Correlations among Measures of the Four Traits

	<i>Locus of control</i>		<i>Emotional stability</i>		<i>Self-esteem</i>	
	ρ	N	ρ	N	ρ	N
<i>Locus of control</i>	-					
<i>Emotional Stability</i>	0.40	6,538				
<i>Self-esteem</i>	0.52	14,691	0.64	5,565		
<i>Generalised Self-Efficacy</i>	0.56	3,088	0.62	1,541	0.85	2,431

Note:

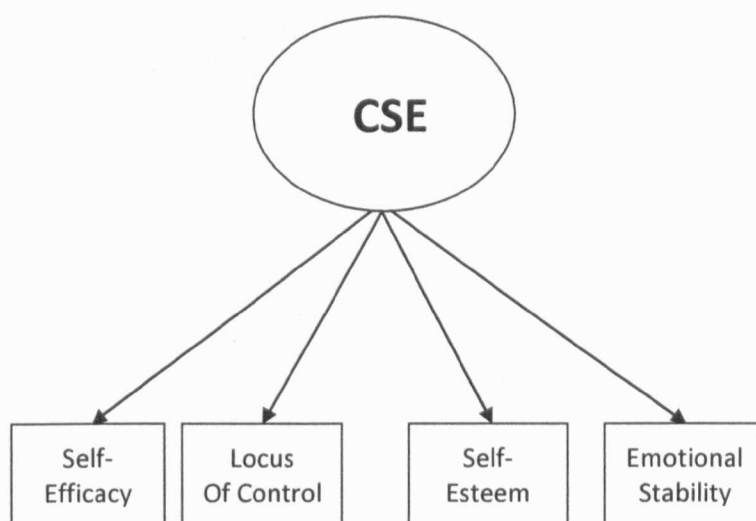
ρ = population correlation (corrected for measurement error).

N = number of participants.

Adapted from: Judge et al. (2002, p.696)

The second piece of evidence concerns factor analytical findings based on principal-component and confirmatory factor analyses (Judge et al., 1998; Heller et al., 2002; Judge & Bono, 2001; Erez & Judge, 2001; Judge et al., 2005; Gardner & Pierce, 2009b). Results from these analysis support the hypothesis of a higher-order core self-evaluations construct 'representing a common CSE factor' (Judge et al., 1998, p.19). For example, Erez and Judge (2001) compared several structural models and found that a second-order latent model fitted the data best as the following fit indices show: X^2 (749, N = 473) = 1520.67, ns; RMSEA = 0.09; NNFI = 0.89; IFI = 0.90; PNFI = 0.69). Based on these results, Erez and Judge (2001, p.1272) concluded, that 'core self-evaluations is a higher order factor that explains the associations among the four lower level traits'.

FIGURE 2.1: Conceptualisation of core self-evaluations



In the following, brief definitions and background will be given to each of the CSE components.

Self-esteem: According to Rosenberg (1965, p.15), self-esteem is a ‘favourable or unfavourable attitude toward the self’. Self-esteem is considered as the evaluative component of the self-concept, a broader representation of the self that includes cognitive, behavioural, evaluative, or affective aspects (Blascovich & Tomaka, 1991). Self-esteem is linked to various behaviour outcomes as well as cognitive and affective well-being components (Schimmack & Diener, 2003).

Locus of control: According to Rotter (1966), locus of control is the degree to which individuals believe that they control events in their lives (internal locus of control) or believe that the environment or fate controls events (external locus of control). Within SWB research, (internal) locus of control is generally positively related to affect and life satisfaction (Steptoe & Wardle, 2001; Gerstorf et al., 2010).

General Self-Efficacy: According to Bandura (Bandura, 1982, p.122), self-efficacy is defined as one's judgements of 'how well one can execute courses of action required to deal with prospective situations'. Thus, self-efficacy is generally thought to represent individuals' belief in their ability to succeed in a particular task or situations (Bandura, 1997). Within well-being research, self-efficacy is a well established construct. High self-efficacy has consistently been linked to higher SWB than low self-efficacy (Lent et al., 2005; Strobel et al., 2011).

Neuroticism: This factor is also frequently called emotional stability, but also emotionality (Digman, 1990). Neuroticism is one of the Big Five personality traits (McCrae & Costa, 1999). Common characteristics associated with neuroticism include poor emotional adjustment and experiences of negative emotional states as anxiety, anger, and guilt (Barick & Mount, 1991). In well-being research, neuroticism is associated with job satisfaction (Judge et al., 2002), life satisfaction (Schimmack et al., 2004) and affect (DeNeve & Cooper, 1998; Steel et al., 2008).

2.8.1. Measurement of core self-evaluations

CSE was, until Judge and colleague's development of a direct measure of the core self-evaluations construct (CSES; Judge et al., 2003), assessed indirectly from the measurement of the four personality traits. To form a single latent CSE construct as hypothesised by CSE theory, the four traits are typically assessed with well established and validated inventories such as the 'Rosenberg Self-Esteem Scale' for *self-esteem* (Rosenberg, 1965), the 'Eysenck Personality Inventory' for *neuroticism* (Eysenck & Eysenck, 1968), the 'Internality, Powerful

Others locus of control, and Chance Scale' for *locus of control* (Levenson, 1981), and a self-developed scale by Judge and colleagues (1998) for *general self-efficacy*. A test battery comprises, if the above measure are used, of 38-items. A single latent CSE factor (usually second-order factor model) of these four measures is then created in a second step using factor analytic techniques such as confirmatory factor analysis (CFA).

From a structural point of view, however, there are some researchers who challenged Judge's proposal of a *superordinate latent* CSE solution. Instead, these authors argued in favour of empirical models in which CSE is either operationalised as an *aggregate* construct or as a *collective set* of separate variables (Johnson et al., 2008; Dormann et al., 2006). For example, Dormann and colleagues (2006) addressed this structural question of CSE in a longitudinal comparative analysis study in which the authors compared three possible model solutions for CSE: 'superordinate', 'aggregate' and 'collective set'.

To comprehend the findings of this comparative study, it makes sense to first clarify the differences between the three proposed multidimensional solutions (that is, 'superordinate', 'aggregate', 'collective set'). *Multidimensional constructs* are generally defined as 'several distinct but related dimensions treated as a single theoretical concept' (Law et al., 1998). As such, they can further be distinguished in three possible ways (Edwards, 2001, p.145): 'If the relationship flow from the construct to its dimensions, the construct may be termed *superordinate* because it represents a general concept that is manifested by specific dimensions. If the relationships flow from the dimensions to the construct, the construct may be termed *aggregate* because it combines specific dimensions into a general concept. The

third option is a *collective set* in which the dimensions that constitute the construct are directly related to the criterion variable.

By comparing these three structural solutions for the CSE construct in a longitudinal design study, Dormann et al. (2006) found that the best model fit to the data was achieved when CSE was conceptualised as a 'collective set', that means, when all four variables were directly related to the dependent variable. Taking such a 'collective set' approach is not only empirically more liable, but gives according to Johnson et al. (2008) an additional advantage to examine unique and joint effects of CSE traits. Based on these argumentations, it seems plausible to operationalise CSE not as a superordinate latent concept as original proposed by Judge and colleagues (e.g. Judge et al., 1998), but rather as a separate set of variables (Dormann et al., 2006).

2.8.2. Predictive and incremental validity of the CSE latent construct

If CSE is a valid and useful concept, then it must show predictive and particularly incremental validity beyond the Big Five core traits. Bracket & Mayer (2003) suggest that a new personality construct must explain variance that is not accounted for by other established constructs (e.g. Big Five) to be accepted in the field (see also Hunsley & Meyer, 2003, p.446). As there is very little evidence in the literature on incremental validity of the single latent CSE construct, the emphasis in the following will predominately lay on reported evidence concerning predictive validity of CSE.

The higher-order latent CSE construct has demonstrated predictive validity in diverse domains such as job and life satisfaction (Judge et al. 1998; Judge et al., 2000; Judge et al., 2002; Judge et al., 2005), stress and strain (Brunborg, 2008; Kammeyer-Mueller et al., 2009), job and task performance (Erez & Judge, 2001; Gardner & Pierce, 2009b), goal setting behaviour (Erez & Judge, 2001), and subjective well-being (Piccolo et al., 2005; Tsaousis et al., 2007).

For example, Judge et al. (2002) showed in several consecutive studies (mixed samples: university students and sales representative) that the average variance (R^2) explained by a single latent CSE factor was 46% for happiness ($N = 862$), 23% for life satisfaction ($N = 1.517$) and 21% for job satisfaction ($N = 717$). Additionally, when Erez & Judge (2001) considered the four traits as indicators of a single latent core self-evaluation construct (Study 1), they found that students' CSE factor (Study 2) was positively related to task performance ($r = 0.35$, $p < 0.01$), task motivation ($r = 0.39$, $p < 0.01$) and task persistence ($r = 0.24$, $p < 0.01$). Employees CSE factor (Study 3) on the other hand were positively related to goal-

setting motivation ($\beta = 0.70$, $p < 0.01$), self-rated performance ($\beta = 0.32$, $p < 0.01$) and sales volume ($\beta = 0.27$, $p < 0.01$).

Further evidence for CSE's predictive quality comes from two prospective studies (Judge et al., 2005). The single CSE latent factor predicted university students' life satisfaction ($N = 183$, $\beta = 0.47$, $p < 0.01$) and employees' job satisfaction ($N = 251$, $\beta = 0.37$, $p < 0.01$). These findings were further replicated and extended cross-culturally. For example, a study among 349 Japanese sales representatives showed that the CSE factor correlated positively with job satisfaction ($r = 0.49$, $p < 0.05$), life satisfaction ($r = 0.52$, $p < 0.05$) and happiness ($r = 0.67$, $p < 0.05$).

In summary, collective evidence suggests that CSE is a significant and useful predictor of work related outcomes. It is important to establish that surface traits, such as CSE, have predictive validity when core traits are controlled. However, there is limited published evidence on incremental validity of CSE beyond core personality traits (e.g. Big Five). The present thesis aims therefore to address this research gap by testing specifically the incremental validity of CSE traits over core personality traits (big five traits).

2.8.3. Direct measure of CSE: The CSES Scale

The second way in which CSE has been operationalised is through a recently developed direct, and more economical, 12-items self-report measure, the *Core Self-Evaluations Scale* (CSES; Judge et al. 2003). The scale development process followed the same theoretical rationale as before, that is, to cover the content domain of the four self-evaluative traits of

self-esteem, self-efficacy, locus of control, and emotional stability. From an initial pool of 65-items, 12 items were selected to comprise the CSES inventory based on their content validity. The 12 items CSES scale (six reverse-scored) is provided below in table 2.2.

TABLE 2.2

Core Self-Evaluations Scale (CSES)

Instructions: Following are several statements about you with which you may agree or disagree. Using the response scale provided, indicate your agreement or disagreement with each item by placing the appropriate number on the line preceding that item.

1 = Strongly disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly agree

--- I am confident I get the success I deserve in life.

--- Sometimes I feel depressed. (reverse-scored)

--- When I try, I generally succeed.

--- Sometimes when I fail I feel worthless. (reverse-scored)

--- I complete tasks successfully.

--- Sometimes, I do not feel in control of my work. (reverse-scored)

--- Overall, I am satisfied with myself.

--- I am filled with doubts about my competence. (reverse-scored)

--- I determine what will happen in my life.

--- I do not feel in control of my success in my career. (reverse-scored)

--- I am capable of coping with most of my problem.

--- There are times when things look pretty bleak and hopeless to me. (reverse-scored)

Judge et al. (2003) presented validation work based on four independent samples (two field studies and two samples of undergraduate students). Psychometric results confirmed that the CSES is reliable, as assessed by internal consistency (average coefficient alpha, $\alpha = 0.84$) and test-retest reliability ($r = 0.81$ over a three months period). More importantly, factor-analytic evidence in all four samples supported a hypothesised one-factor solution, suggesting that the CSES is a unidimensional scale. Model fit indices for this solution were sufficiently high (cf. Hu & Bentler, 1999) as the following values show: average GFI/CFI = 0.92, average RMSEA = 0.08, average SRMR = 0.06 (Judge et al., 2003). The single-factor structure of the 12-item CSES was also replicated and supported in several cross-cultural validation studies with Spanish, Dutch, and German samples (Judge et al., 2003, 2004; Heilmann & Jonas, 2010; Stumpp et al., 2010).

CSES demonstrated additionally *convergent* and *discriminant* validity. With regard to convergent validity, Judge et al. (2003) found that CSES scores correlated strongly with measures of the four core traits of self-esteem, generalised self-efficacy, emotional stability, and locus of control (self-esteem: $r = 0.87$; generalised self-efficacy: $r = 0.82$; emotional stability: $r = -0.76$; internal locus of control: $r = 0.50$). Discriminant validity was further established by examining CSES scores with the Big 5 measures of extraversion, conscientiousness, agreeableness, and openness to experience; in each case, CSES was separable from these established constructs.

2.8.3.1. Predictive and incremental validity of CSES

Besides good psychometric qualities, CSES also demonstrated *predictive validity* in diverse domains such as job and life satisfaction (Judge et al., 2003; Heilmann & Jonas, 2010; Gardner & Pierce, 2009b), job performance (Judge et al., 2003), goal commitment (Bono & Colbert, 2005), goal setting (Erez & Judge, 2001), motivation (Judge et al., 2005), burnout (Best et al., 2005), stress (Brunborg, 2008), and health functioning (Tsaousis et al., 2007).

For example, in a cross-sectional study among 430 health care employees, Best et al. (2005) showed that low CSES scores had a direct negative effect on burnout ($\beta = -0.31, p < 0.05$). Tsaousis and colleagues (2007) further tested in a cross-sectional study (N = 160) whether CSES can predict students' health functioning. Results from multiple regression analysis demonstrated that CSES explained a significant amount of incremental variance in physical health ($\Delta R^2 = 0.04$) and psychological health ($\Delta R^2 = 0.04$) after controlling age and subjective well-being. The influence of CSES is particularly well documented with regard to job satisfaction (e.g. Stumpp et al., 2010) where it can be considered as 'perhaps the best dispositional predictor of job satisfaction' (Judge et al., 2004, p.332).

CSES demonstrated not only predictive validity, but more importantly, *incremental validity* above and beyond the effect of the Big Five factors. For example, Heilmann & Jonas (2010) conducted a validation study of CSES in two German speaking samples (N = 200 work force and N = 134 university students). Findings from multiple regression analysis showed that even after controlling for demographic variables (occupation, marital status) and all five personality factors (agreeableness, conscientiousness, neuroticism, openness, extraversion) CSES explained 2% of variance in life satisfaction (R^2 change = 0.02, $p < 0.05$). Also Judge

and colleagues (2003) examined the incremental validity of CSES across four independent samples consisting of employees (sample 1), sales persons (sample 2), and students (sample 3 and 4). Findings showed (see table 2.3) that CSES predicted incremental variance when a) neuroticism, extraversion and conscientiousness was controlled for and, b) the full set of the Big Five factors. The R^2 change varied accordingly between 2% and 8% for job satisfaction, 8% for job performance, and 4% for life satisfaction in sample one and two. CSES predicted further in both student samples between 2% and 4% of variance in life satisfaction after controlling for three personality factors (sample 3) and all Big Five factors (sample 4).

TABLE 2.3

Incremental Validity of CSE Controlling for the Big Five Core Traits							
	<i>Sample 1</i> N = 279		<i>Sample 2</i> N = 175			<i>Sample 3</i> N = 205	<i>Sample 4</i> N = 126
	JS	JP	JS	JP	LS	LS	LS
<i>Step 1: Big Five</i>	0.49**	0.18*	0.46**	0.29**	0.56**	0.49**	0.60**
<i>Step 2: CSES</i>	0.02**	0.11**	0.08**	0.03	0.04**	0.04**	0.02*

Notes:

CSES = Core Self-Evaluation Scale, JS = Job Satisfaction, JP = Job performance, LS = Life satisfaction.

The number of variable entered into the regression on each step is provided in parenthesis. For sample 1 and 3 [1,3], five-factor model (FFM) consists of Neuroticism, Extraversion, and Conscientiousness. For sample 2 and 4 [2,4], all five Big Five traits were used.

(ΔR^2), * $p < 0.05$, ** $p < 0.01$.

Adapted from Judge et al. (2003, p.322)

Moreover, the CSES also displayed incremental validity in the prediction of the criterion variables (Job satisfaction, job performance, life satisfaction) over separate measures of self-esteem, generalised self-efficacy, neuroticism, and locus of control in all samples (Judge et al., 2003).

Overall, research concerning the psychometric qualities of CSES scale provides some compelling evidence in terms of validity and utility in predicting important outcomes in different domains. In addition, CSES seems to be assessing something unique and separate from the other Big Five traits (incremental validity), as well as CSE's own core traits.

2.8.4. CSE and subjective well-being

Research on core self-evaluations has consistently revealed a positive relationship between CSE and life satisfaction suggesting that people with positive and high core self-evaluations are overall more satisfied with their lives than low scorers. Both measures of CSE (multidimensional and unidimensional) showed thereby to be equally positively related to life satisfaction (Judge et al., 1998; 2002; 2005; Piccolo et al., 2005; Heller et al., 2002; Kluemper, 2008; Heilmann & Jonas, 2010; Gardner & Pierce, 2009b). However, while many studies have confirmed the predictive importance of CSE on life satisfaction, there are fewer studies that have explored these effect on the affective SWB component, or indeed, on all three SWB components simultaneously.

Among the few studies is a cross-sectional study by Piccolo and colleagues (2005) that showed a significant relation between CSE (measured by a single-latent CSE factor) and affective well-being (measured with PANAS scale; Watson et al., 1988; and a happiness scale by Underwood & Fromming, 1980) in 271 Japanese sales employees. Results showed that CSE correlated significantly with positive affect, $r = 0.45$ ($p < 0.05$), negative affect, $r = -0.54$ ($p < 0.05$), and happiness $r = 0.67$ ($p < 0.05$), respectively. The regression model with happiness as the criterion variable further revealed that CSE predicted 45% of variance in this positive emotional state variable ($R^2 = 0.45$, $p < 0.05$).

There are also few studies that used the 12-items scale to predict variance in affective outcomes, or indeed in both, cognitive and affective SWB. For example Tsaousis et al. (2007) showed in a cross-sectional study with 160 university students that CSES functioned as a moderator between subjective well-being and physical health. Results revealed in particular that CSES was significantly correlated with all three SWB components, that is, positive affect ($r = 0.53$, $p < 0.001$), negative affect ($r = -0.43$, $p < 0.001$), and life satisfaction ($r = 0.51$, $p < 0.001$), respectively. Similar significant results between CSES and positive affect ($r = 0.64$, $p < 0.05$) were reported in a recent validity study among 236 employees in the United States (Gardner & Pierce, 2009b).

2.8.5. Summary of CSE

First, despite controversies over CSE's conceptualisation as a single latent construct, there is sufficient evidence to suggest a 'collective set' solution. Second, as the validity coefficients

for the CSES scale are also sufficient, it can be applied as an alternative short measure of CSE. Third, compelling evidence attests that CSE is a consistent and powerful predictor of subjective well-being components.

2.9. Trait emotional intelligence

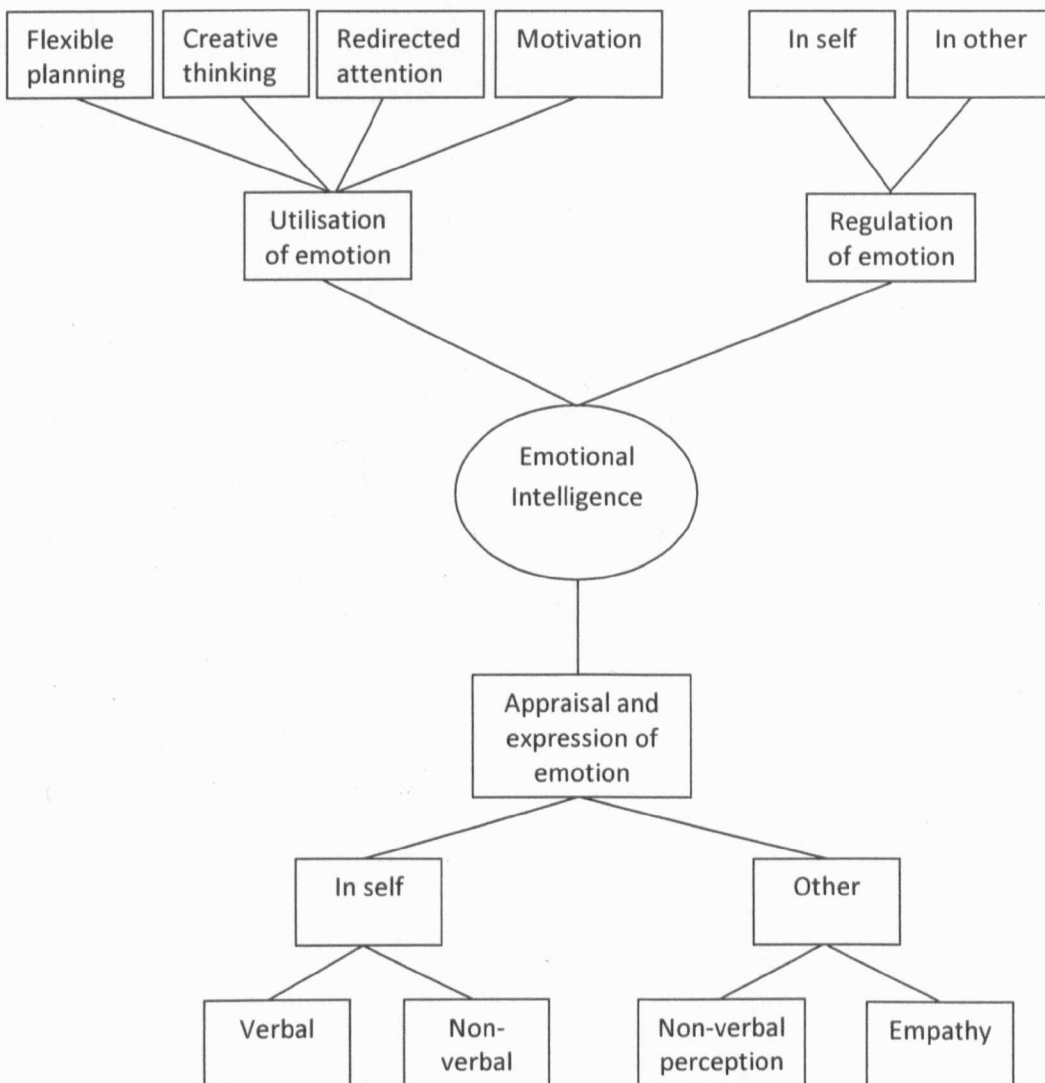
Despite early research into social intelligence by Thorndike (1920) and later by Gardner (1983), the term Emotional intelligence (EI) was not scientifically scrutinised until the 1990s. Salovey and Mayer (1990) proposed the first definition and model of emotional intelligence. They defined EI as ‘the ability to monitor one’s own and other’s feelings and emotions, to discriminate among them and to use this information to guide one’s thinking and actions’ (Salovey & Mayer, 1990, p.189). Since this early definition, EI research has rapidly grown with many authors providing different definitions and conceptualisations. A common element on which most psychological definitions seem to build on is that individuals differ in emotional skills. However, ‘the nature of these individual differences have been subject to debate’ (Mikolajzak, 2009, p.28).

2.9.1 Models and dimensions of emotional intelligence

Several comprehensive models of emotional intelligence have been proposed to provide a theoretical framework for conceptualising the construct (Salovey & Mayer, 1990; Goleman,

1995; Mayer & Salovey, 1997; Bar-On, 1997; Cooper & Sawaf, 1997; Weisinger, 1998; Higgs & Dulewicz, 1999; Petrides & Furnham, 2001). Figure 2.2 shows a detailed representation of the first developed EI model by Salovey & Mayer (1990).

FIGURE 2.2: Salovey and Mayer's 1990 model of emotional intelligence



Most developed models since Salovey & Mayer's (1990) are typically classified to fall either into an 'ability' or 'mixed' model approach (Mayer et al., 2000). However, more recent advances suggest that the distinction in EI should not be based on any EI model, but rather exclusively on the measurement method used in the operationalisation process of EI. In other words, what seems important is the procedure by which EI is measured (Petrides & Furnham, 2000, 2001; Petrides et al., 2004; Tett et al., 2005; O'Connor & Little, 2003; Warwick & Nettelbeck, 2004).

Following this reasoning, a clear cut schism in EI research is proposed based on *typical* versus *maximum* EI behaviour measures (Petrides & Furnham, 2001; Petrides et al., 2007a). *Typical behaviour* is usually assessed with self-report measures that are supposed to measure dispositions and self-perceptions. In contrast, *maximum behaviour* is typically assessed with performance based measurements that tap into aspects of proficiencies, abilities, and achievement (cf. Wilhelm, 2005; Petrides & Furnham, 2000). Accordingly, EI tests that assess EI via self-report measures are considered to represent personality like constructs (labelled trait emotional intelligence or trait EI). In contrast, EI tests that rely on maximum performance tests assess ability like constructs related to human intelligence (labelled 'ability EI'). This distinction thus promotes two separate research streams with different underlying theoretical assumptions and definitions (Petrides, 2010; Mikolajczak, 2009).

On the one hand the ability EI perspective, that defines EI as 'the cooperative combination of intelligence and emotion', and further as 'a member of class of intelligence including the social, practical and personal intelligence' (Mayer et al., 2004, p.197). And on the other hand the trait EI perspective, that defines EI as 'a constellation of emotion-related dispositions capturing the extent to which people attend to, identify, understand, regulate, and utilise their emotions and those of others' (Mikolajczak, 2009, p.26).

Importantly, Petrides et al. (2007a, p.153) notes that ‘the operationalisation of one does not have implications for the operationalisation of the other’. In other words, both concepts can ‘co-exist’. Indeed, the low correlation between ability EI and trait EI suggests that both constructs measure different aspects of human behaviour (e.g. O’Connor & Little, 2003; Goldberg et al., 2006; Bracket et al., 2006).

This distinction is further sustained by the fact that a) trait EI measures correlate less highly with intelligence measures than ability EI measures and b) ability measures on the other hand display zero correlation with personality traits (MacCann & Roberts, 2008; Newsome et al., 2000; Roberts et al., 2001; Derksen et al., 2002). This thus supports the claim that trait EI and ability EI are distinct from each other and are likely to yield different measurements of the same individual based on typical versus maximum behaviour assessments. A recent comparative study between ability-based (MSCEIT; Mayer et al., 2003) and self-report measures of EI (WLEIS: Wong & Law, 2002) among medical students seems to support this differentiation (Brannick et al., 2009).

TABLE 2.4

Trait EI versus Ability EI

	<i>Trait EI</i>	<i>Ability EI</i>
Measurement	Self-report	Performance-based
Conceptualisation	Personality trait	Cognitive ability
Expected relationship to <i>g</i>	Orthogonal (i.e., uncorrelated)	Moderate to strong correlations
Construct validity evidence (<i>a</i>)	Good discriminant and incremental validity vis a vis personality Good concurrent and predictive validity with many criteria	Limited concurrent and predictive validity Lower than expected correlations with IQ measures
Example measures	EQ-I SEIS TEIQue	MSCEIT
Properties of measures	Easy to administer Susceptible to faking Standard scoring procedure Good psychometric properties	Difficult to administer Resistant to faking Atypical scoring procedures Weak psychometric properties

Note:

g = general cognitive ability; EQ-I = Emotional Quotient Inventory (Bar-On, 1997); SEIS = Schutte Emotional Intelligence Scale (Schutte et al., 1998); TEIQue = Trait Emotional Intelligence (e.g. Petrides & Furnham, 2003); MSCEIT = Mayer-Salovey-Caruso Emotional Intelligence Test (Mayer et al., 2002).
(*a*) Entries in these rows are generalisations and do not apply to all measures

Adapted from Furnham, 2009, p.143

However, despite the extensive use of ability and trait EI measures, there are many researchers that criticised and strongly opposed EI on theoretical and empirical grounds

(Matthews et al., 2002; Zeidner et al., 2004; Locke, 2005; Brody, 2004; Conte, 2005; Murphy, 2006; Landy, 2005; Mayer et al., 2008; Keele & Bell, 2008; Orchard et al., 2009). The focal point of these criticisms surrounded the vagueness of concepts employed by EI researchers (e.g. Matthews et al, 2004; Locke, 2005) as well as measurement issues concerning ability (e.g. Brody, 2004) and trait EI inventories (e.g. Conte, 2005).

2.9.2. Rationale for the investigation of trait EI in dentistry

Despite the debate over measurement problems, EI has over the last decade predicted behaviour in many domains including work and health (e.g. Van Rooy & Viswesvaran, 2004; Martins et al., 2010). Emotional intelligence (EI) is also increasingly recognised in medicine, nursing, and dentistry to play a potential role for personal mental health and professional practice (Wagner et al., 2002; Carrothers et al., 2000; Elam et al., 2001; McMullen, 2003, Akerjordet & Severinsson, 2007; Birks et al., 2009; cf. for a recent systematic review in medicine by Lewis et al., 2005 and Arora et al., 2010). Studies in dentistry have demonstrated for example that trait EI plays a significant role in stress perception (Pau et al., 2003, 2007), clinical interview performance (Hannah et al., 2009) and patient satisfaction (Azimi et al., 2010).

The present thesis examines particularly the role of trait EI as there is reason to believe that trait EI corresponds to a 'profile of dispositions that lead to greater adaption' (Mikolajczak, 2009, p.26). More precisely, it has been argued that trait EI clusters of emotional control and regulation significantly impact upon self-regulatory processes that influence adaptive behaviour. Empirical evidence in support of this adaptive hypothesis using measures of trait

EI is robust. Most findings in this studies attest that high trait EI individuals more likely a) perceive stressful situations as a challenge rather than a threat, and, b) adapt a proactive coping response when encountering a challenging situations (Saklofske et al., 2007; Petrides et al., 2007b; Mikolajczak et al., 2007b, 2007c, 2008). A high capacity for emotional self-insight and self-regulation have also been shown to affect motivation and goal processes (Spence et al., 2004; Christie et al., 2007). For example, Spence et al. (2004) showed that high trait EI individuals set more personal goals that reflect congruent motives compared to low trait EI scorers. Additional support for the adaptive hypothesis comes from dental research where evidence from cross-sectional and multi-national studies demonstrate that trait EI can predict perceived stress levels in dental students (Pau et al., 2003, 2007). Based on these adaptive qualities, it seems interesting to explore whether trait EI also influence dentists' subjective well-being.

2.9.3. Measurement of trait emotional intelligence

Trait emotional intelligence has been measured in a number of ways, but typically with self-report inventories. Perez and colleagues (2005) reviewed over 15 different trait EI measures such as the EQ-I (Bar-On, 1997), Trait Meta Mood Scale (TMMS: Salovey et al., 1995) or the Emotional Intelligence Self-Regulation Scale (EISRS: Martinez-Pons, 2000). The present thesis uses two of the most commonly employed trait EI inventories in applied research: the Schutte Emotional Intelligence Scale (SEIS: Schutte et al., 1998) and the Trait Emotional Intelligence Questionnaire (TEIQue-SF: Petrides & Furnham, 2006). Both measures have

been used extensively in the literature (e.g. Pau et al., 2003, 2007 used the SEIS to measure dental students trait EI) and display sufficient validity to justify their use.

2.9.3.1. Psychometric properties of the SEIS (Schutte et al., 1998)

Schutte and colleagues (1998) developed a 33-item self-report EI inventory that measures 'a homogeneous construct of emotional intelligence' (Schutte et al., 1998, p.175). The authors used the original model of emotional intelligence of Salovey and Mayer (1990; cf. figure 2.2) as a basis for the development of a self-report measure of emotional intelligence. Item analysis was based on principal component analysis (PCA) with Varimax rotation identifying a single factor of 33-items (from originally 62 items). Based on this finding, Schutte et al. (1998) recommended using total scores on the 33-item scale to assess a general trait EI factor. However, subsequent factor analytic studies undermined Schutte's single factor solution by showing a more stable three and four factor solution (Austin et al., 2004; Petrides & Furnham, 2000; Saklofske et al., 2003; Ciarrochi et al., 2001).

For example, Petrides & Furnham (2000), Saklofske et al. (2003) and Ciarrochi et al. (2001) showed that a four factor structure of the 33-items explained more total variance than a single factor. The four factors identified for example by Petrides & Furnham (2000) were described as follows: (i) optimism/mood regulation, (ii) appraisal of emotion, (iii) social skills, and (iv) utilisation of emotions. Further support for a four factor solution of the SEIS scale has recently been presented in a factor validity study by Keele & Bell (2008).

Based on mixed factorial findings of the SEIS scale, Petrides & Furnham (2000) generally recommended researchers to factor-analyse the SEIS scale when using it in empirical studies. Another psychometric concern of the SEIS scale relates to the small numbers of reverse-

keyed items (scale contains only three reversed items) (Saklofske et al., 2003). Small numbers of reverse items can generally reduce validity and increase the risk of response bias (Ray, 1983). Applied to the SEIS measure means that 91% of the items are keyed in the same direction (Petrides & Furnham, 2000), thus increasing the risk for response bias.

Despite the above criticisms, the SEIS scale has been used extensively in the literature as either a unidimensional (global trait EI) or multidimensional (three or four factor) measure of trait EI (e.g. Schutte et al., 1998, 2001; Petrides & Furnham, 2000; Saklofske et al., 2003; Keele & Bell, 2008; cf. Schutte et al., 2009).

2.9.3.2. Reliability of the SEIS scale

Schutte et al. (1998) reported initially a cronbach alpha coefficient of 0.87 and a test-retest reliability of 0.78. Subsequent studies have confirmed the high reliability of the total EI score (e.g. Pau & Croucher, 2003). Table 2.5 shows a selection of studies from different populations and countries (cf. Schutte et al., 2009, pp. 123-23 for an extended list of studies).

TABLE 2.5

Internal Consistency of SEIS Scale from Different Samples and Countries

<i>Author</i>	<i>Sample</i>	<i>Country of Collection</i>	<i>Scale Alpha</i>
Bracket & Mayer (2003)	207 University Students	United States	0.93
Carmeli (2003)	98 Senior Managers	Israel	0.90
Yurtsever (2003)	94 University Lectures	Turkey	0.95
Pau & Croucher (2003)	223 Dental Students	United Kingdom	0.90

Reliabilities of the subscale are also high. For example, Keele & Bell (2008) reported Cronbach alpha values of 0.78 (Optimism), 0.83 (Appraisal of Emotions), 0.80 (Social Skills), 0.78 (Utilisation of Emotions) for the four factors identified by Petrides & Furnham (2000).

2.9.3.3. Convergent validity

The SEIS also demonstrated convergent validity, that is, correlation with theoretically related constructs. Schutte et al. (1998) reported significant negative correlations with alexithymia (defined as having a lack of awareness of emotion and inability to express emotion) ($r = -0.65$), optimism ($r = 0.52$), depression ($r = -0.37$) and impulsivity ($r = -0.39$). Additionally, the SEIS scale showed positive correlations with similar trait EI measures. For example, Bracket and Mayer (2003) and Austin et al. (2003) found that scores on the SEIS scale had positive correlations of $r = 0.67$ and $r = 0.43$ with the total score of the long and short measure of the Bar-On Emotional Intelligence Inventory (EQ-i: Bar-On, 1997; EQ-i:S: Bar-On, 2002). Ng et al. (2010) found further that total scores of the SEIS correlated significantly with the total score of Wong and Law's (2002) trait EI scale ($r = 0.70$). Gardner & Qualter (2010) reported a correlation of $r = 0.73$ with the long form of the TEIQue (Petrides & Furnham, 2003). Overall, these results indicate that the SEIS scale has strong convergent validity.

2.9.3.4. Discriminant validity

As the trait EI perspective considers EI as a personality trait construct (Petrides et al., 2007c), many studies have examined the measure's discriminant validity in relation to the Big Five personality dimension. The need to examine this stems from the claim that trait EI (including the SEIS scale) is indeed not completely distinct from core personality traits but part of it as Petrides et al. (2001, 2007c) and de Raad (2005) have argued. More precisely, Petrides and colleagues (2007b, 2007c) claim that trait EI encompasses two kinds of variance: one portion of variance already covered by established trait taxonomies (e.g. Big Five, Giant Three) and one portion of variance that lies outside these dimensions. Factor-analytic evidence (Petrides et al., 2001, 2007c) seem to support this notion with trait EI emerging as a distinguishable lower-order personality factor within the Five Factor Model (NEO PI-R; Costa & McCrae, 1992) as well as within the Eysenckian three factor model (EPP: Eysenck et al., 1992). The researchers therefore conclude that their factor location analyses demonstrate that 'trait EI is a distinct (because it can be isolated in personality space), compound (because it is partially determined by several personality dimensions) construct that lies at the lower levels of personality hierarchies (because the trait EI factor is oblique, rather than orthogonal to the Giant Three and the Big Five)' (Petrides et al., 2007c, p.283).

Opponents of trait EI argue that precisely because of the high overlap between existing personality measures, trait EI is not much different from these well-studied scales (e.g. Bracket & Mayer, 2003; MacCann et al., 2004). Thus, trait EI is argued to lack discriminant validity. For example Bowman and colleagues (2002, p. 141) conclude in this regard that 'EI is simply an old wine (trait personality) dressed up in a new bottle (EI)'. Because of this criticism, recent self-report trait EI studies have started to control for personality traits such as the Big Five (incremental validity).

With regard to the SEIS scale and the big five traits, reported correlations of $r = 0.21$ to $r = 0.62$ between the SEIS and Big Five (see table 2.6) further underlines the necessity to control for core personality traits when testing predictive power of trait EI (cf. Bracket & Mayer, 2003; Kluemper, 2008). Studies in dentistry have widely used the SEIS scale to predict for example perceived stress, but have never controlled for variance caused by core personality traits (incremental validity test). This constitutes a serious limitation of published findings in this regard and further work is required to show that trait EI predicts stress and well-being controlling the Big Five.

TABLE 2.6

Relationship of SEIS Scale to Five-Factor Model of Personality

	Neuroticism	Extraversion	Openness	Agreeableness	Conscientious
Bastian et al. (2005) <i>N</i> = 239	-0.42**	0.62**	0.44**	0.31**	0.32**
Bracket & Mayer (2003) <i>N</i> = 202	-0.19**	0.32***	0.43***	0.09	0.25***
Schutte et al. (1998) <i>N</i> = 346	-0.28	0.28	0.54**	0.26	0.21

Note: ** $p < 0.01$, *** $p < 0.001$

2.9.3.5. Predictive and Incremental Validity of SEIS Scale

Besides sufficient psychometric qualities, SEIS also demonstrated predictive validity in diverse domains and in a variety of populations. The SEIS scale predicted for example adjustment to university in undergraduate students (Schutte & Malouff, 2002) and academic performance (Schutte et al., 1998).

Further studies showed that high scorers on the SEIS scale are associated with less debilitating fatigue (Brown & Schutte, 2006), higher performance (Carmeli & Josman, 2006), less depression (Oginsak-Bulik, 2005), greater life satisfaction (Wing et al., 2006) and higher marital satisfaction (Schutte et al., 2001). This pattern is also consistent with the results of recent meta-analysis with regard to health and work outcomes (Schutte et al., 2007; Van Rooy & Viswesvaran, 2004; Martins et al., 2010).

The question of incremental validity is crucial for trait EI research as mentioned earlier on. Several studies have examined the incremental validity of the SEIS global scale (Saklofske et al., 2003; Bracket & Mayer, 2003; Gardner & Qualter, 2010), and there are further findings for the SEIS subscales (Chapman & Hyslip, 2005; Gardner & Qualter, 2010) against the Big Five dimensions.

Most studies that examined incremental validity with regard to subjective well-being criteria (PA, NA, LS) consistently suggest that global trait EI is a particular good predictor beyond the Big Five Factors. Table 2.7 shows data from two large studies in which SEIS added significant incremental validity over the Big Five on happiness and life satisfaction, on a magnitude of 6% to 20% (Saklofske et al., 2003; Gardner & Qualter, 2010).

TABLE 2.7

Partial Correlations between SEIS and Outcome Measure Controlling for all Big Five Dimensions

<i>Criterion Measure</i>	<i>SEIS Scale</i>	<i>p-value/N</i>
SHS	0.15**	* p < 0.05
TSWLS-1	0.13*	** p < 0.01
TSWLS-2	0.11*	*** p < 0.001
TSWLS-3	0.22***	
TSWLS	0.20***	N = 304

(a) Saklofske et al. (2003)

SHS	0.06**	**p < 0.001
SWLS	0.09**	
		N = 306

(b) Gardner & Qualter (2010)

Note:

(a): Partial correlations controlling for the personality traits of Neuroticism, Extraversion, Openness, Conscientiousness and Agreeableness. SHS, Subjective Happiness Scale; TSWLS, Temporal Satisfaction with Life Scale; TSWLS-1, past satisfaction with life; TSWLS-2, concurrent life satisfaction; TSWLS-3, estimated future life satisfaction
N = Number of participants

(b): Partial correlation beyond age, gender (Step 1), Big Five (Step 2), Global trait EI (Step3)
SHS, Subjective Happiness Scale; LS, Satisfaction with Life Scale
N = Number of participants

In summary, the SEIS has widely been used in research and many studies suggest good reliability of this scale and reasonable evidence for validity. The structural question and the small number of reverse keyed items represent critical issues that need to be considered when using this inventory. The overall evidence demonstrated, however, that the SEIS can predict variance in many outcomes domains and particularly with regard to SWB.

2.9.3.5. Psychometric properties of the TEIQue-SF (Petrides & Furnham, 2006)

The TEIQue-Short Form (TEIQue-SF: Petrides & Furnham, 2003; Petrides, 2009) is a 30-item questionnaire designed to measure global trait emotional intelligence. It is based on the full form of the TEIQue (Petrides & Furnham, 2003; Petrides, 2009), which covers the sampling domain initially developed following content analysis of the salient EI models in the literature including Bar-On's (1997), Goleman's (1995), and Salovey and Mayer's (1990). Petrides and colleagues identified 15 facets presented in Table 2.8 that are equally covered in the long and short version of the TEIQue (Petrides & Furnham, 2003; Petrides & Furnham, 2006; Petrides, 2009). The latest version of the long-form of the TEIQue comprises 153 items, yielding scores on 15 facets, four factors, and global trait EI (Petrides, 2009).

TABLE 2.8

The Sampling Domain of Trait EI

Facets	High scorers perceive themselves as.....
Adaptability	flexible and willing to adapt to new conditions
Assertiveness	forthright, frank, and willing to stand up for their rights
Emotion expression	capable of communicating, their feelings to others
Emotion management (others)	capable of influencing other people's feelings
Emotion perception (self and others)	clear about their own and other people's feelings
Emotion regulation	capable of controlling their emotions
Impulsiveness (low)	reflective and less likely to give in to their urges
Relationship skills	capable of having fulfilling personal relationships
Self-esteem	successful and self-confident
Self-motivation	driven and unlikely to give up in the face of adversity
Social competence	accomplished networkers with excellent social skills
Stress management	capable of withstanding pressure and regulating stress
Trait empathy	capable of taking someone else's perspective
Trait happiness	cheerful and satisfied with their lives
Trait optimism	confident and likely to 'look on the bright side' of life

Adapted from Petrides et al. (2004, p.574)

The short-form (TEIQue-SF) is selected in the present thesis because a) it is more economic b) less exhausting for participants especially when other lengthy measures are included in the test battery c) it is based on the long version of the TEIQue (two items from each of the 15 subscales of the long form were included in the short form) (Petrides & Furnham, 2003; Petrides, 2009). The decision to include the short version over the long version is further sustained by a recent study that indicates that both versions (short and long TEIQue) ‘provide near-identical estimates of trait EI at the global level, and broadly similar estimates at the factor level’ (Petrides et al., 2010, p. 909).

2.9.3.6. Reliability of the TEIQue-SF

Studies that have used the TEIQue-SF report good reliability (see table 2.9). The internal consistency of this scale (Cronbach alpha = α) have been consistently reported in these studies to be above $\alpha = 0.85$.

TABLE 2.9
Reliability Coefficients for Global TEIQue-SF

<i>Petrides et al. (2010)</i>	$\alpha = 0.87$
<i>Petrides & Furnham (2006)</i>	$\alpha = 0.87$
<i>Smith et al. (2008)</i>	$\alpha = 0.94$
<i>Mikolajzak et al. (2006)</i>	$\alpha = 0.88$
<i>Ali et al. (2009)</i>	$\alpha = 0.90$

2.9.3.7. Convergent and discriminant validity of the TEIQue-SF

There is little reported information about convergent and discriminant validity in the available original publications of the TEIQue-SF (Petrides & Furnham, 2006). However, the authors report adequate validity in that respect in their unpublished technical manual (Petrides & Furnham, 2004). Based on the fact that the short form is correlated with the TEIQue Subscales of the long form, further convergent and discriminant validity are reported here with regard to published work on the TEIQue-long version.

For example Petrides and colleagues (2006) found that teachers trait EI ratings converged with students trait EI scores on most TEIQue subscales indicating ‘convergence between self- and other-perceptions of emotion-related abilities’ (Petrides et al., 2006, p.103). Mikolajczak and colleagues (2006) showed in a sample of undergraduate students (N = 100, mean age: 18.36, SD = 2.47) that the total score of the TEIQue and the four subfactors were negatively correlated with alexithymia, a related emotional construct (total TEIQue: $r = -0.55$ $p < 0.001$; Well-Being: $r = -0.42$, $p < 0.001$, Self-control: -0.24 $p < 0.05$, Emotional Skills: $r = -0.64$, $p < 0.001$, Social Skills: $r = -0.39$ $p < 0.001$).

Convergent validity of the TEIQue (global and subfactors) was further confirmed in a study (Freudenthaler et al., 2008) among 352 undergraduate students (mean age = 22.35, SD = 4.43) with regard to two other emotional self-report measures, the Trait Meta-Mood Scale (TMMS: Salovey et al., 1995) and the Self-Assessments of Interpersonal Emotional Abilities Scale (SEAS: Freudenthaler & Neubauer, 2005).

Petrides et al. (2007c) also report evidence for the discriminant validity of trait EI, as measured by the TEIQue (long version) in a Greek sample (N = 274, mean age: 22.45, SD = 5.85). When the TEIQue scales were factored jointly with the scales of the Eysenck

Personality Questionnaire (Eysenck & Eysenck, 1975) and the Trait Personality Questionnaire (Tsaousis, 1999), an oblique trait EI factor emerged in addition to other basic personality traits. Example correlations of this oblique trait EI factor with the Big Five dimensions were as follows: $r = -0.29$ with Neuroticism, $r = 0.01$ with Agreeableness, $r = 0.35$ with Conscientiousness, $r = 0.30$ with Extraversion and $r = 0.13$ with Openness (Petrides et al., 2007c). Based on these correlations, Petrides and colleagues concluded that trait EI is not orthogonal to the major personality dimensions and should therefore predict external criteria incrementally over the Big Five (Petrides et al., 2003, 2007c).

2.9.3.8. Predictive and incremental validity of the TEIQue-SF

Numerous studies have shown the *predictive validity* of TEIQue-SF on outcomes such as happiness (Furnham & Petrides, 2003), general well-being, job satisfaction (Singh & Wood, 2008), lower levels of stress (Pau et al., 2007), perceived job control (Petrides & Furnham, 2006), relationship satisfaction (Smith et al., 2008), and negatively with mental disorder (Mikolajczak et al., 2006) and communicative anxiety (Dewale et al., 2008).

Several studies have further addressed the *incremental validity* of the TEIQue-SF (Furnham & Petrides, 2003; Singh & Woods, 2008; Reid, 2009). For example, Furnham & Petrides (2003) conducted a cross-sectional study with 88 participants (mean age: 19.79, SD = 0.83). When the Big Five personality factors (NEO PI-R: Costa & McCrae, 1992) were in a step-wise hierarchical regression analysis entered with trait EI to explain variance in happiness (as measured by the Oxford Happiness Inventory, Argyle et al., 1989), results showed that trait EI was the strongest predictor of happiness, accounting for over 50% of the total variance,

whereas none of the big five traits turned out to have significant beta weights. Similar significant results with regard to general well-being and job satisfaction were found in a study by Singh & Woods (2008) based on an Indian community sample (N = 123). Reported findings from three multiple step wise regression analyses showed that after controlling for three core personality factors (Extraversion, Neuroticism, Conscientiousness) in step 1, trait EI (measured by the TEIQue-SF) predicted between 6% and 9% of unique variance in job satisfaction and general well-being. The regression model further showed that when trait EI was included in step 2, it had the only significant beta weight for predicting job satisfaction ($\beta = 0.33, p < 0.01$).

Collectively, these results provide good support for the proposition that global trait EI, as measured by the TEIQue-SF, predict additional variance in well-being indicators beyond more traditional higher order personality traits as well as cognitive ability constructs (e.g. Intelligence Quotient, IQ).

2.9.3.9. Summary of Trait EI

The discussion in this section detailed the conceptual origin of the EI construct as well as the various conceptualisation and their associated measurement instruments. To comply with a more rigorous approach in examining the evidence at hand, this section subsequently discussed reliabilities, construct validity as well as incremental and predictive validity of two commonly used trait EI measures, the SEIS (Schutte et al., 1998) and the TEIQue-SF (Petrides & Furnham, 2006). In addition, where appropriate, some unresolved issues as well as strength and weaknesses of these measurement instruments were discussed.

TABLE 2.10

Summary of Trait EI and CSE

	<i>Trait EI</i>	<i>CSE</i>
Measurement	Self-report	Self-report
Conceptualisation	Emotional related personality trait at the lower level of personality hierarchy. Further conceptualised as a surface trait and a personal resource with buffer capacity	Cognitive related personality trait at the lower level of personality hierarchy. Further conceptualised as a surface trait and a personal resource with buffer capacity
Expected relationship to core personality traits (e.g. Big Five)	Moderate to strong correlations	Moderate to strong correlations
Construct validity evidence (<i>a</i>)	Adequate discriminant and incremental validity vis-a-vis personality Good concurrent and predictive validity with many criteria	Adequate discriminant and incremental validity vis-a-vis personality Good concurrent and predictive validity with many criteria
Example measures	SEIS TEIQue	Indirect measure of all four traits Direct measure: CSES
Properties of measures	Easy to administer Susceptible to faking Standard scoring procedure Good psychometric properties	Easy to administer Susceptible to faking Standard scoring procedure Good psychometric properties

Note: SEIS = Schutte Emotional Intelligence Scale (Schutte et al., 1998).
TEIQue = Trait Emotional Intelligence (Petrides, 2009).
CSES = Core self-evaluations scale (Judge et al., 2003).

2.10. Links between CSE/trait EI and subjective well-being

Evidence reviewed so far attest that CSE and trait EI are valid predictors of subjective well-being. However, less is known about the potential pathways that could account for this relationship. One promising psychological mechanism is rooted in motivational research. The idea behind this approach comes from research that successfully shows that personality and motivation can be integrated within a path model using self-determination variables as mediators. This approach has been used successfully by Judge and colleagues (Judge et al., 2005) who have shown that SDT variables mediate the relation between CSE and life and job satisfaction.

2.10.1. Self-determination theory as a mediator between CSE/trait EI and SWB

Self-Determination Theory (SDT) represents a broad theoretical framework for the study of human motivation (Deci & Ryan, 1985, 2002). According to SDT, human motivation differs in the degree to which it is autonomous (intrinsic) versus controlled (extrinsic). Generally, intrinsically motivated (regulated) behaviour is assumed to represent core aspects of the self, and people who engage in activities characterised by intrinsic motivation tend to do tasks more out of interests and enjoyment. Extrinsic motivated behaviour is in contrast thought to be less supported by inherent interests and core motives (from within the self) and more driven by external influences such as rewards (e.g. to obtain money) or to avoid punishment (Deci & Ryan, 1985). The second important construct in SDT relates to human needs as

hypothesised for example in earlier work of Maslow (1943) and McClelland (1965). Basic psychological need satisfaction represent in SDT the underlying motivational mechanism that energizes and directs people's behaviour (Deci & Ryan, 2000a). Needs are from this perspective regarded as 'innate requirements' that need to be satisfied for individuals to flourish (Ryan, 1995; Deci & Ryan, 2002). SDT differentiate between three basic needs. First, the need for *autonomy*, that is, the need to feel volitional in ones actions and to experience a sense of choice and psychological freedom while engaging in behaviour (Deci & Ryan, 2002; DeCharms, 1968). Second, the need for *competence* refers to the need to feel a sense of effectance upon ones environment (Deci & Ryan, 2002; White, 1959). This concept shares in some respect similarities with Bandura's social-cognitive theory of 'self-efficacy' that also emphasises a sense of self perceived competence as a central aspect of motivation (Bandura, 1997). Third, the need for *relatedness* refers mainly to the 'need to belong' (Baumeister & Leary, 1995) that is, to form strong emotional bonds, and to feel genuinely connected (to) and appreciated (by) others (Deci & Ryan, 2002; Bowlby, 1979). The three psychological needs are argued to form a central part of SDT because they specify the conditions for development of self-determined motivation (Ryan & Deci, 2000a). SDT suggests that intrinsic forms of motivation influence well-being more positively than extrinsic forms because people are better able to satisfy their three fundamental psychological needs of autonomy, competence, and relatedness while engaging in intrinsically driven actions (Deci & Ryan, 2000a, 2000b; 2002).

SDT researchers have examined not only the interconnections between motivation and basic needs, but more precisely explored the differential effects of goal *content* (the 'What': Intrinsic vs. Extrinsic) and *processes* (the 'Why': *Autonomous vs. External goal regulation*)

on need satisfaction and well-being (Ryan et al., 1996; Deci & Ryan, 2000b; Sheldon et al., 2004; Reis et al., 2000; Vansteenkiste et al., 2008).

2.10.2. The content or the ‘what’ of goals

SDT postulates that goal content is associated with individual well-being (Kasser & Ryan, 1993, 1996). Specifically, a differentiation is drawn between *intrinsic goal contents* such as self-acceptance (growth, autonomy, self-regard), affiliation (having a good relationship with friends and family), and community contribution (improving the world through activism or generativity), and *extrinsic goal contents* such as financial success (to accumulate wealth and possessions), image (to look attractive in terms of one’s body and clothing), and social recognition (being famous and well-known) (Kasser, 2002, p.128). As intrinsic and extrinsic goal contents are theorised to have differential relations to basic needs, it is posited that basic psychological needs account for the differential relations of goal contents to well-being measures (Deci & Ryan, 2000b; Kasser, 2002; Vansteenkiste et al., 2008). For example, Sebire and colleagues (2009) found that basic need satisfaction partially mediated the relation between intrinsic (relative to extrinsic) goal content and psychological well-being.

Further support for the importance of basic need satisfaction for well-being comes from several studies (Sheldon et al., 1996; Reis et al., 2000). For example, Reis and colleagues (2000) conducted a diary study where daily well-being and need satisfaction were measured over a period of fourteen consecutive days. After controlling for trait and previous day measures of well-being, satisfaction of each of the three needs was significantly associated with a composite well-being score indexed by positive and negative affect, vitality and

absence of physical symptoms. In the work context, initial evidence was found for a positive relation between need satisfaction and employee's work-related well-being (e.g. job satisfaction, work engagement, and lower burnout) (Baard et al., 2004; Vansteenkiste et al., 2007; Van den Brock et al., 2008). Taken together, these findings thus suggest, as theorised by SDT, that being connected to important others, feeling competent and autonomous does influence the experience of general as well as work specific well-being.

To understand better how intrinsic and extrinsic goal contents are typically assessed in this research, it is helpful to focus on methodological aspects. Participants rate typically the importance to themselves of various life goals, and also their beliefs about the likelihood of attaining these goals. Table 2.11 shows examples of items for intrinsic and extrinsic goal content (Kasser & Ryan, 1996).

TABLE 2.11
Intrinsic vs. Extrinsic Life Goal Content

Goal Content	Wording (example items)
Intrinsic	
Growth	To know and accept who I really am.
Relationship	To have good friends that I can count on.
Community	To help others improve their lives.
Extrinsic	
Financial Success	To be a very wealthy person
Fame	To be admired by lots of different people.
Image	To achieve the 'look' I've been after.

It is critical to note that SDT researchers are not interested in the general importance and likelihood people place on life goals, but more specifically, on the relative centrality of intrinsic and extrinsic goals. To analysis intrinsic and extrinsic goal orientations, relative

intrinsic and extrinsic goal composites are either calculated (mean correction method; Schmuck et al., 2000), or, overall mean scores (total importance or likelihood score of all life goals) are statistically controlled for in step one of the hierarchical regression analysis (e.g. Kasser & Ryan, 1993). Either procedure, however, allows the researcher to evaluate the predictive power of intrinsic relative to extrinsic goals in the domains of interest.

From an empirical point of view, there is evidence to support most of SDT's goal content assumptions. Factorial validity and longitudinal studies have supported claims about a) a distinction between extrinsic and intrinsic life goals (Kasser & Ryan, 1996; Grouzet et al., 2005), b) a meaningful link between relative intrinsic goals and basic need satisfaction (Vansteenkiste et al., 2007), and c) a positive impact when relative intrinsic goals are pursued in life domains including health (Williams et al., 2002), work (Van Den Broeck et al., 2008), pro-social behaviour (Duriez et al., 2007), education (Vansteenkiste et al., 2004) and cognitive/affective well-being components (Kasser & Ryan, 1996; cf. empirical overview, Kasser, 2002; Vansteenkiste et al., 2008).

2.10.3. The process or the 'why' of goals

However, some have critiqued SDT's intrinsic/extrinsic goal content framework by arguing, that it is not the content (the 'what'), but more importantly the reason (the 'why') for having a goal that matters most (Carver & Baird, 1998; Srivastan et al., 2001). The reason or the why (motive) of goals refers to the underlying motive behind goals.

Individuals may pursue goals for intrinsic or extrinsic reasons, which correspond to autonomous or controlled reasons, respectively. SDT postulates that people's reasons or motives for goal striving influences their level of well-being (Deci & Ryan, 2000b; Sheldon, 2002). Specifically, a differentiation is drawn between self-concordant and disconcordant goals.

Self-concordant goals are defined as those that fulfil basic psychological needs, are congruent with core motives and interests, and originate from intrinsic and identified forms of motivation. As these type of goals emanate from intrinsic forms of motivations (intrinsic or identified reasons), they are argued to receive more likely attention and energy in form of sustained effort and persistence. This in turn is assumed to affect positively people's goal progress/attainment, experiences of need satisfaction during the goal pursuit, and well-being levels. Disconcordant goals, in contrast, refer to the extent to which people feel compelled to pursue extrinsic forms of motivations (introjected or external reasons) by internal feelings (e.g. feelings of guilt shame) or external forces (e.g. significant others) (Chatzisarantis et al., 2008). As these type of goals do not represent accurately underlying motives and interests (Sheldon, 2002), they are more likely a) to cause 'intrapersonal conflicts' (Sheldon & Houser-Marko, 2001) b) receive less volitional resources such as the capacity to exert sustained effort (Koestner et al., 2002), and c) to hinder need satisfaction experiences (Sheldon & Elliot, 1999; Sheldon & Houser-Marko, 2001; Sheldon & Kasser, 2001; Sheldon, 2002).

To understand better how self-concordant and disconcordant goals are typically assessed in this research, it is worth focusing on some methodological issues. Participants usually list a number of personal goals in form of 'personal projects' (Little, 1993) or 'personal strivings'

(Emmons, 1986). Each generated personal goal is then rated on four 'perceived locus of causality' (PLOC) scales. This PLOC method was initially developed by Ryan and Connell (1989) and, used within the self-concordance theory to examine specifically the quality or degree to which each listed goal is pursued for autonomous versus controlled reasons (Sheldon, 2002). Table 2.12 lists the four appraisals on which each participant rates their self-generated goal(s).

TABLE 2.12

The Four Reasons for Personal Goal Pursuit

Reason	Wording
Intrinsic	because of the fun and enjoyment which the goal provides you. While there may be many good reasons for the goal, the primary reason is simply your interest in the experience itself.
Identified	because you really believe that it is an important goal to have. Although this goal may once have been taught to you by others, now you endorse it freely and value it wholeheartedly.
Introjected	because you would feel ashamed, guilty, or anxious if you did not. Rather than striving just because someone else thinks you ought to, you feel that you ought to strive for that something.
External	because somebody else wants you to or thinks you ought to, or because you will get something from somebody if you do. That is, you probably would not strive for this if you did not get some kind of reward, praise, or approval for it.

Note: Adopted from Sheldon & Elliot (1998)

Two of these goal regulatory styles, intrinsic and identified motivations (self-concordant motivation), are thereby perceived to foster more autonomous and self-determined behaviour as they are more likely enacted out of a full sense of choice or volition. Individuals who pursue such goals (for autonomous or intrinsic reasons) are doing so mainly because they enjoy or identify strongly with motives and values for pursuing the goal. In contrast, introjected and external regulations (self-disconcordance) are argued to facilitate more controlled behaviour as they are enacted out of external pressure or feelings of guilt (that

means the primary source of motivation lays more outside of the self) (Ryan & Connell, 1989; Sheldon, 2002). As researchers are typically interested in self-concordant forms of motivation, a procedure is proposed in which a relative autonomy index (called RAI) is formed. Most studies that employed this procedure have calculated such an autonomy index by summing the intrinsic and identified ratings the participants makes for each of his or her goals, and subtracting the external and introjected ratings (Sheldon, 2002). The resulting relative autonomy index (RAI) reflects thus the degree of autonomy (or intrinsic goal motivation) with which the goal is endorsed and pursuit.

From an empirical point of view, there is enough compelling empirical evidence to support most of the goal congruence propositions. Longitudinal studies support the notions that a) self-concordant goals receive more sustained effort b) self-concordant goals connected stronger to basic need satisfaction, and c) self-concordant goals predict positively subjective well-being measures (Carver & Baird, 1998; Sheldon & Elliot, 1998; Sheldon & Kasser, 1998; Sheldon & Elliot, 1999; Deci & Ryan, 2000b; Sheldon & Houser-Marko, 2001; Koestner et al., 2002; Sheldon et al., 2004; Judge et al., 2005; Sheldon, 2008). The predictive role of motive congruency for outcomes including subjective well-being has also received support from similar research lines (e.g. Brunstein et al., 1998; Pueschel et al., 2011).

2.10.4. Distinguishing between the ‘what’ and the ‘why’ of goal pursuit

The two main components of SDT presented thus far pertain to the content (the ‘what’) and the reasons (motives) why individuals pursue a given goal (for autonomous or controlled reasons). Both approaches are similar, but differ in terms of the emphasis on goal content (Deci & Ryan, 2000b) and the process that leads to goal generation (Carver & Scheier, 2000). Additionally, one can also differentiate methodological aspects between the two approaches.

Goal content research focuses explicitly on life goals whereas self-concordance research focuses on mid-level idiographic personal goals (self-generated). Life goals are theoretically considered to hold a higher position in a hierarchical goal structure (cf. Austin & Vancouver, 1996) than personal goals which are described as midlevel units (Roberts & Robins, 2000; Little, 2007). Some authors further argue that life goals differ from personal goals as such, because they have a ‘greater generality, are relatively stable over time, and reflect what people generally strive for in their lives’ (Bleidorn et al., 2010, p.367). For example, for dental students a specific life goal would be to have a career as a dentist, whereas a personal goal would be more short term such as finishing a project, or writing an assignment.

Another difference between life goals and personal goals relate to the goal elicitation procedure. Personal goals are typically assessed through an ideographic (self-generated) goal response format where participants are asked to list a set of personal goals. Each generated goal is subsequently rated on four theoretical derived dimensions (‘perceived locus of causality: PLOC: Ryan & Connell, 1989; Sheldon, 2002) that examine the quality or degree to which each listed personal goal is pursued for autonomous vs. controlled reasons. The assessment of life goals, in contrast, has typically focused on importance and likelihood

ratings of a number of pre-defined derived domains (nomothetic goal procedure) in which participants respond to a standard set of life goals (cf. Massey et al., 2008, p.443).

2.10.4.1. Core self-evaluations and self-concordant goals

Before discussing empirical findings that connect the two constructs, it seems vital to clarify theoretically why CSE effects on intrinsic motivation are expected to occur. A large part of the answer to this can be found in findings of a relation between the four independent CSE traits and intrinsic goal motivation.

Self-esteem and intrinsic goal motivation: Self-esteem is a self-concept that has often been linked to motivation (Pierce & Gardner, 2004). One reason for this relates to the way how high and low self-esteem individuals react to external cues such as social influences. For example, according to Brockner's (1988) *behavioural plasticity theory*, individuals with low self-esteem are more 'behavioural plastic' (reactive) to external cues than people with high self-esteem who are argued to be more confident about their competence and thus less responsive to external cues. Particularly, high self-esteem is argued to make individuals less susceptible to social influence and more inclined to endorse goals for intrinsic reasons congruent with their values and motives (Judge et al., 2005). Empirical work supports this line of reasoning by showing that the global self-esteem construct is positively related to self-reliance, resistance to social pressures, and self-determined motivation (Deci & Ryan, 1995; Korman, 2001; Pierce & Gardner, 2004).

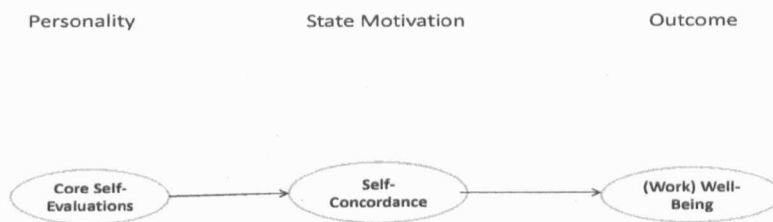
Internal locus of control and intrinsic goal motivation: Internal locus of control is another central part of CSE that has frequently been associated with an intrinsic goal motivation (e.g. Phillips & Gully, 1997; Ng et al., 2006). Internal locus of control refers to individuals' belief that the cause or control of events is something they can influence (Rotter, 1990). This 'self-agent' belief of personal control orientation has further been argued to be important for the development of intrinsic motivation (Deci & Ryan, 2000b). As individuals with an internal locus of control perceive behavioural consequences as a result of their own decisions and choices, they should generally possess a stronger need for intrinsic goal motivation (Ng et al., 2006).

General self-efficacy and intrinsic goal motivation: General self-efficacy also influences goal-directed behaviour (Bandura, 2001; Bandura & Locke, 2003). High self-efficacy individuals are more confident that they can achieve goals, and feel able to set a greater range of goals, including congruent goals. People with lower self-efficacy may be inhibited from setting congruent goals if they feel that they cannot achieve them. As individuals with high-perceived self-efficacy believe in their own capability to execute required goal tasks successfully, they ought to choose more congruent and engaging goals (Ryan & Deci, 2002). For example, Sheldon and Kasser (1998) showed that ratings of general self-efficacy correlate positively with self-concordant goal ratings.

Emotional stability and intrinsic goal motivation: Emotional stability has also been shown to relate to motivation (Parks & Guay, 2009). Individuals with greater emotional stability tend to set more challenging goals, have stronger self-efficacy beliefs, and have stronger beliefs that working on an activity will result in a specific outcome. For example, Turban and colleagues found in a longitudinal study that emotional stability was positively related to self-concordant goal motivation among 260 university students (Turban et al., 2007).

In summary, research between the four single CSE traits and intrinsic motivation suggest that a meaningful relation exists. Figure 2.3 shows in line with this an expected path model that links CSE and (work) well-being through intrinsic goal motivation.

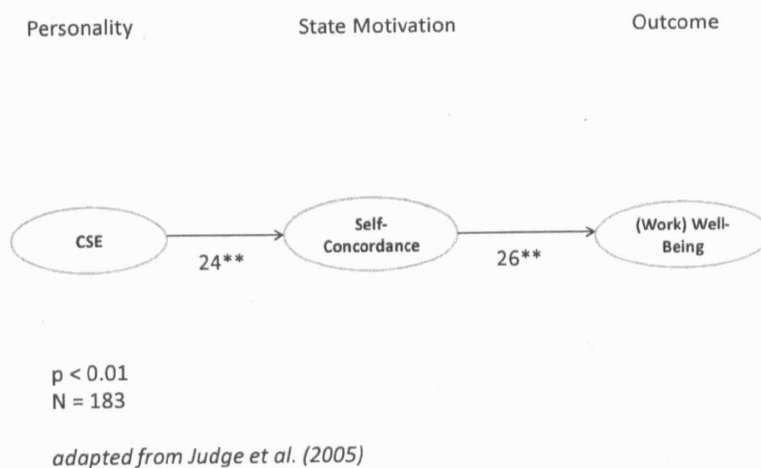
FIGURE 2.3: Mediation model linking CSE to (work) well-Being



Using the self-concordance model as a framework for exploring the potential motivational mechanism through which core self-evaluations relate to job and life satisfaction, Judge and colleagues (2005) tested the above model (Figure 2.3) based on two samples (Study 1: University Students, N = 183; Study 2: Adult Working Sample, N = 251). In other words, Judge expected that people with high CSE set more likely self-concordant goals which in turn should affect positively their job and life satisfaction.

Findings confirmed the hypothesis that CSE (measured as a higher order latent construct) positively related to the adaption of identified and intrinsic goals (transformed into a self-concordance composite, cf. Sheldon & Elliot, 1999) (see Figure 2.4; fit statistics: RMSEA = 0.8; RMSR = 0.09; CFI = 0.97; IFI = 0.97). Self-concordant goal in turn, influenced positively measures of life ($\beta = 0.26, p < 0.01$) as well as job satisfaction ($\beta = 0.19, p < 0.05$).

FIGURE 2.4: Findings from Judge et al. (2005)



2.10.5. Trait EI and the self-concordant goals

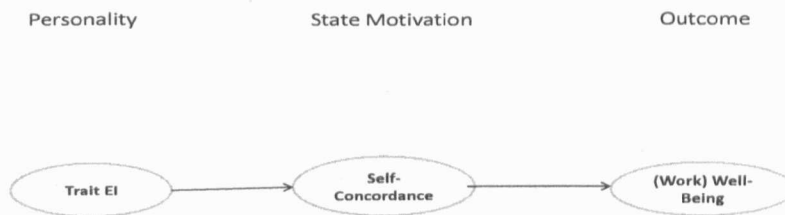
Before discussing empirical findings that connects the two constructs, it seems vital to clarify theoretically why trait EI effects on intrinsic goal motivation are expected to occur. A large part of the answer to this question can be found in research relating to the concept of self-

awareness. Self-awareness is according to self-determination theorists an essential requirement for the promotion of autonomous regulation (Brown & Ryan, 2004). Accordingly, it is argued that 'the more fully an individual is apprised of what is occurring internally, the more adaptive and value-consistent his or her behaviour is likely to be' (Brown & Ryan, 2004, p.114). What seems to foster such self-endorsed activities according to this view are trait concepts that relate to self-awareness. As trait EI's inherent capacity for emotional self-awareness and self-knowledge represents such a concept, it seems likely that it matches the aforementioned requirement. The self-awareness aspect of trait EI should thus make it more likely that individuals are able to gain accurate understanding of their implicit emotions and motives and this should foster in turn a more autonomous style of goal regulation. If correct, then trait EI and the adoption of congruent personal goals should be related processes.

Spence and colleagues (2004) tested this hypothesis in a cross-sectional study. Using the self-concordance model, 95 students generated eight personal goals that they typically or characteristically were trying to attain in their daily life (Emmons, 1986). These were further rated according to the four goal striving appraisals specified in SDT (intrinsic, identified, introjected, external). Participants also answered a self-report questionnaire that contained measures of trait EI (as measured by the SEIS scale, Schutte et al., 1998) and emotional well-being (as measured by the positive/negative affect scale; Bradburn, 1969). Results indicated as hypothesised, that people with higher trait EI were also those who set goals for congruent reasons. However, as analyses were only significant on the univariate level, the authors could only provisionally conclude that 'trait EI and the adoption of congruent personal goals are related processes' (Spence et al., 2004, p.460). The study lacked in addition power due to its small sample size. Nevertheless, the results sustain the idea that a possible link between trait EI and self-concordant goal could exist. And that such a link in turn may affect

subjective well-being if it was tested in a mediational model (cf. Figure 2.5) with sufficient power as for example in Judge and colleagues study (2005).

FIGURE 2.5: Mediational model of trait EI

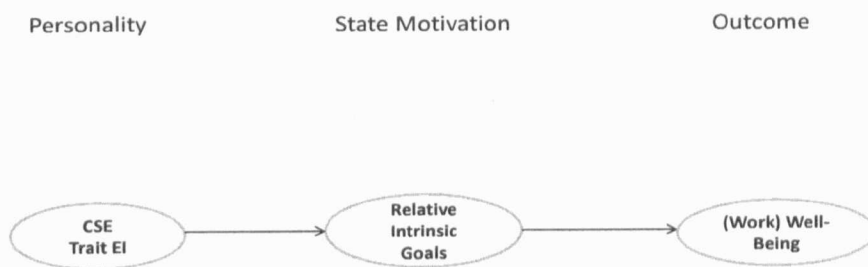


2.10.5.1. CSE/trait EI and the content of goals (the 'what')

Self-determination theory is not only concerned with understanding the reasons why individuals pursue a given goal (self-concordant goal pursuit; Sheldon & Elliot, 1999), but equally so, the contents of people's goals (relative intrinsic goal content; Kasser & Ryan, 1996). The previous section has argued that a meaningful relation could exist between CSE/trait EI and the reasons why people adopt self-concordant goals. If such a meaningful relationship exists, it seems plausible that it also exists with regard to the pursuit of relative intrinsic goals. This thought is further sustained by the fact that the pursuit of relative intrinsic goals is positively correlated to an autonomous goal regulation (typically around $r = 0.30$; Vansteenkiste et al., 2008). Thus, it could be assumed that CSE/trait EI relate to relative intrinsic goal pursuit in a similar way as previously argued with regard to self-concordant goals. However, despite this theoretical possibility, there is no empirical research that has yet

tested such a potential link. The present thesis proposes therefore to test the following path model depicted in Figure 2.6.

FIGURE 2.6: Theoretical model linking CSE/trait EI, relative intrinsic goals and (work)-well-being.



2.10.6. Summary

Evidence so far indicates that mediators rooted in goal research possibly explain the effects of personal resources (trait EI and CSE) on well-being. As goals have demonstrated to function as unique predictors of subjective well-being (e.g. Brunstein, 1993; Emmons, 1986; cf. Wiese, 2007), it makes sense to test such a hypothesis in dental students and dentists.

Practically speaking, such findings would enable the design of more effective training programs that take into account the different self-regulatory process at play.

2.11. Subjective well-being in dentistry

The study of SWB has been applied to numerous areas of occupational psychology, yielding the insight that SWB is protective against job and personal stressors (Lyubomirsky et al., 2005). Particular emphasis has been placed upon the effects of personal resources (CSE; trait EI) on SWB via goal pursuit processes (Diener & Fujita, 1995; Hobfoll, 2002; Xanthopoulou et al., 2009; Judge et al., 2005; Spence et al., 2004). However, there have been few applications of this body of research to the study of stressors in dentists or dental students.

There are a number of reasons why SWB theory could benefit the study of stressors in dentists and dental students. First, SWB theory is a well-grounded theoretical construct, which has yielded important insights into the ways in which stress buffering occurs in other occupational groups (Howell et al., 2007; Diener & Chan, 2010). Second, current research in dentistry uses conceptually similar concepts in the literatures on job engagement and job satisfaction (Hakanen et al., 2005; Shugars, 1990; Harris et al., 2007; Harris et al., 2009a, 2009b).

Job engagement refers to a positive, work related state of well-being, consisting of self – perceived dedication, absorption and high levels of energy (Schaufeli et al., 2002). Job engagement is further argued to be an indicator of positive psychological well-being (Schaufeli & Salanova, 2007; Salanova et al., 2010). Job satisfaction, on the other hand, is

also a work-related well-being construct and refers generally to cognitive and affective appraisals of one's work (Spector, 1997). Job satisfaction has further been found to be closely related to life satisfaction and positive/negative affect measures (Judge & Watanabe, 1993; Connolly & Viswesvaran, 2000; Judge & Ilies, 2004; Bowling et al., 2010). From a conceptual point of view, there are strong similarities between job satisfaction and job engagement theories (Judge et al., in press). This is further underlined by the fact that they both share significant associations with affective and cognitive components of SWB.

Nonetheless, it might be unwise to suggest that these constructs are interchangeable. Job engagement and job satisfaction refer to a narrower range of phenomena; the person's professional or work functioning. SWB is a broader construct that relates to functioning over a range of life domains, including relationships, leisure and work (Diener et al., 1999). The question of how work well-being is most appropriately measured is still an ongoing debate in the literature. Some researchers argue for context specific (e.g. job satisfaction, work engagement) measures, whereas others for context free (general well-being) or a combination of some of these (work) well-being measures (Cotton & Hart, 2003; Page & Vella-Brodrick, 2009; Daniels, 2000). It makes therefore sense to use context specific (job satisfaction) and context free (SWB) well-being measures in the present thesis as both represent specific and broader forms of well-being. A further argument for the use of both forms is their significant and strong relation with work and health outcomes.

As there is limited literature on SWB in dentists (or in physicians, cf. Shanafel et al., 2003; Tyssen et al., 2009), it seems justifiable to review dentists job engagement and job satisfaction constructs as both a) represent direct indicators of work well-being and b) associate significantly with SWB component.

2.12. Job satisfaction, work engagement, and SWB in dentistry

The concept of job satisfaction has been defined in many ways (cf. Spector, 1997; Judge & Klinger, 2007). The most used definition of job satisfaction in organisational research is that of Locke (1976), who described job satisfaction as ‘a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences’ (p. 1304). Studying job satisfaction is generally important because of its reported influence on a person's physical and mental well-being (Faragher et al., 2003) and its possible effects on job-related behaviours and performance (Brief & Weiss, 2002; Judge et al., 2001; Judge et al., in press).

Despite the central role of job satisfaction for work and health related outcomes, it has received less attention in dentistry, particularly in the UK (Harris et al., 2007). Studies about dentists' job satisfaction have frequently shown that contextual factors such as the perception of income, respect, patient relations, and some socio-demographic characteristics are significantly associated with practitioners' levels of satisfaction (Chapko et al., 1986; Cooper et al., 1987; Shugars et al., 1990; Gilmour et al., 2005; Harris et al., 2009a). A recent study by Harris et al. (2009a) further emphasised the importance of the health care system on job satisfaction for dental practitioners operating in different working settings in England. A summary of factors influencing dentists satisfaction with work is further provided below. Table 2.13 lists specifically positive factors that were found in a review of several key studies (Gorter et al., 2006).

TABLE 2.13

Work Related Factors Positively Influencing Job Satisfaction among Dentists

Patient contacts
Technical results
Sense of freedom
Income
Recognition/appreciation
Professional growth
Responsibility
Non-chair side activities
Staff contacts
Quality of care
Autonomy
Professional environment

Adopted from Gorter et al. (2006, p.23)

Whilst these studies show how contextual factors significantly influence dentists job satisfaction, there is less work on possible personality effects (cf. Schwartz & Shenoy, 1994; Chambers, 2001). This is in contrast to research in organisational psychology where findings clearly demonstrate that personality traits such as positive self-evaluations significantly influence job satisfaction (Judge et al., 1998; Judge & Bono, 2001; Kafetsios & Zampetakis, 2008).

In addition to dentists' job satisfaction, a second work related topic has recently emerged, that is, the study of dentists job engagement (sometimes also called work engagement). The Utrecht Work Engagement Scale (UWESP; Schaufeli & Bakker, 2003) conceptualises work engagement as three core dimensions: vigor, dedication, and absorption. *Vigor* is characterised by high levels of energy and mental resilience while working. *Dedication* is characterised by a sense of significance, enthusiasm, inspiration, pride, and challenge.

Finally, *absorption* refers to being fully concentrated and deeply engrossed in one's work (Schaufeli et al., 2002, p. 74-75).

Generally, studies outside dentistry show that work engagement could function as a protective factor against burnout and may therefore help reduce levels of depression and psychosomatic complaints (Hakanen et al., 2006; Bakker & Leiter, 2010; Schaufeli & Bakker, 2004). Additionally, work engagement is associated with positive job outcomes such as performance (Halbesleben & Wheeler, 2008), job initiative (Salanova & Schaufeli, 2008), learning motivation, and job satisfaction (Harter et al., 2002).

Research in dentistry has recently examined levels of dentists work engagement as well as potential predictors. Several national studies in Holland (Brake et al., 2007), Finland (Hakanen et al., 2008), and the United Kingdom (Denton et al., 2008) have initially addressed the question of dentists engagement with their job. For example, a study among UK dentists (N = 335, response rate, 70.8%) found that only 15% of practitioners reported high levels of work engagement (as measured with the Utrecht Work Engagement Scale), whereas a high percentage reported average (68%) to low engagement scores (17%) (Denton et al., 2008).

In addition to levels of dentists work engagement, research has also addressed potential predictors (Hakanen et al., 2005; Hakanen et al., 2008; Gorter et al., 2008; Gorter & Freeman, 2011). This research line has strongly been influenced by work in organisational psychology where job characteristics (or job resources) such as social support, performance feedback, skill variety, autonomy, and learning opportunities were found to predict positively individuals' engagement in different job domains (Bakker & Demerouti, 2008; Bakker et al., 2005).

Similarly, research in dentistry has also explored specific job characteristics that may influence dentists view to see their work as satisfying and engaging (e.g. Gorter et al., 2008; Denton et al., 2008). Findings so far indicate that work aspects such as immediate and long-term results of work, patient care, idealism/pride of work, entrepreneurship, material benefits, and professional craftsmanship predict how strongly dentists are engaged with their work. Results further indicate that engaged dentists experience higher job satisfaction and practice commitment (Gorter et al., 2006; Gorter et al. 2008; Hakanen et al., 2005, 2008; Gorter & Freeman, 2011). Targeting specific work environment aspects may thus be one promising way in which dentists work-related well-being may be promoted.

Recent advancement in work psychology suggests, however, that work engagement is not only influenced by job characteristics, but importantly, by individual factors such as positive self-evaluations (Xanthopoulou et al., 2007, 2009; Weigl et al., 2010). This means that positive self-evaluations are increasingly recognised as crucial determinants of occupational well-being in both the job engagement and job satisfaction literature. Besides that, there is evidence that positive self-evaluations are further associated with goal-setting, motivation, performance, coping, and life satisfaction (Judge et al., 1998; Erez & Judge, 2001; Judge et al., 2005; Spence et al., 2004; Christie, et al., 2007).

Research in dentistry on the other hand has not yet examined how positive self-evaluations and personal resources may relate to job satisfaction and SWB. Consequently, one of the major underlying research questions in this thesis is to understand the role of positive self-evaluations for personal (SWB) and work related well-being (job satisfaction) of dentists. Secondly, a motivational pathway will be explored. This pathway is expected to influence directly SWB, but also mediate the relationship between positive self-evaluations and SWB/Job Satisfaction. Both research questions are novel and yet untested in dental research.

Dental students are not yet formal practitioners, but during their training they undertake work which is similar to that undertaken by qualified dentists. Just like dentists, dental students form part of an organisational structure in which they are required to fulfil a professional role. This role requires engaging with staff and patients. Thus, it can be argued that similar environmental and personal factors have similar effects on dental students as they have on dental practitioners. This argument is further sustained by longitudinal findings that compared dental students with dentists (Cain et al., 1983; Chamberlain et al., 2005; Chambers, 2001).

Well-being of dental students is a concern in dental education. Previous work has predominantly focused on prevalence of dental students stress, sources of stress, consequences of prolonged stress (e.g. burnout) and potential predictors (e.g. trait emotional intelligence). From this work it seems established that dental students (i) experience more stress compared to other student cohorts (e.g. Newbury-Birch et al., 2002), (ii) perceive factors related to their dental training environment as typical sources of stress such as frequent examinations, reduced leisure time and performance pressure (e.g. Polychronopoulou & Divaris, 2010; Alzahem et al., 2011), (iii) are at higher risk of developing burnout during dental school (Gorter et al., 2008), (iv) perceive stress less likely when they possess high trait emotional intelligence (Pau et al., 2003, 2007). The key findings in this research field further suggest that stress and burnout rates of clinical students appear to mirror those of qualified practitioners (Denton et al., 2008; Gorter et al., 1998; Myers & Myers, 2004; Osborne & Croucher, 1994). This further reinforces the aforementioned argument that environmental and personal factors may affect both groups in a comparable way not only in terms of stress and burnout, but more importantly with regard to well-being.

It is increasingly recognised that positive mental health (subjective well-being) plays a strong role for health and work (e.g. Lyubomirsky et al., 2005). The study of subjective well-being in particular has focused on the investigation of its antecedents (cf. Lucas & Diener, 2008). It is clear from the evidence presented earlier that the effects of personality traits such as core self-evaluations, trait emotional intelligence, and intrinsic motivation on (work) well-being measures (SWB, Job Satisfaction, Job Engagement) are relevant not only for university students in general, but equally so, for many professional groups.

Despite these promising findings about subjective well-being and its antecedents, there exist remarkably few studies that have attempted to study either determinants or outcomes of dental student's well-being from this perspective. One of the few examples is a cross-sectional study among 320 dental students in Japan that examined a) levels of psychological well-being b) potential predictors and c) its relation to stress (Sagiura et al., 2005). The authors found, using the Psychological General Well Being (PGWB) index, that dental students scored lower on the total PGWB index than the population norm. Importantly, each dimension of the PGWB index related negatively to the mean Dental Environment Stress (DES) score. In other words, dental school stress was less likely to be experienced by students with high general well-being scores. This results was further confirmed in a multiple regression analysis where general well-being was the strongest unique predictor of dental students stress (the other two predictors were gender and first choice for admission).

However, one of the major limitations of this study is the use of the 'Psychological General Well Being' (PGWB) index as an indicator of well-being. This index includes in comparison to other subjective well-being scales (e.g. 'PANAS', 'SWLS') only one well-being subscale. The other five subscales tap predominantly into aspects of general health and distress

(general health, vitality, depressed mood, anxiety and self-control). Any inferences based on these findings then should rather be interpreted as indicating distress than SWB. In conclusion, there is no available published data which allow considering either levels or determinants of SWB in dental students.

To address this lack of research in dental education, the present thesis tests (i) potential predictors of SWB particularly with regard to positive self-evaluation constructs and (ii) meditational pathways that link these personal resources to SWB with a clear focus on motivational processes derived from self-determination theory (Deci & Ryan, 2000a). The speculated predictive role of CSE and trait EI on SWB components will be the focus in the first cross-sectional study, whereas the second and third study will explore a mediational pathway using the self-concordance model (Sheldon & Elliot, 1999) and the 'Intrinsic-Extrinsic-Aspiration Index model (Kasser & Ryan, 1993; 1996). All three studies are theoretically justified and yet not validated in dental education.

Hypothesised Models to be Tested in this Thesis

Figure 2.7: Study one

Study 1: Cross-Sectional Design, Dental Students

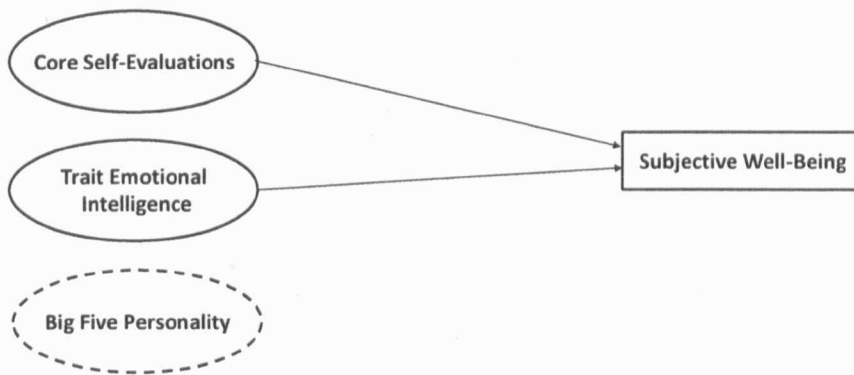


Figure 2.8: Study two

Study 2 : Cross-Sectional Design, Dental Students

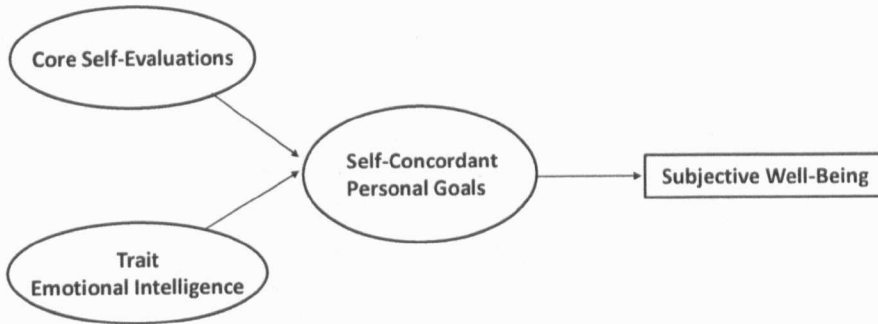


Figure 2.9: Study Three

Study 3 : Cross-Sectional Design, Dentists

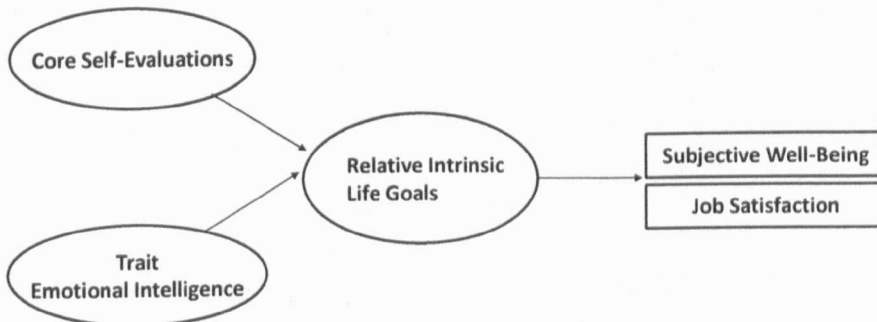


TABLE 2.14

Overview of Study Design, Number of Participants, Variables

	Study Design	Number Part.	Independent Measures	Dependent Measures
Study 1	Cross-sectional Dental Students	N = 218	30-items <i>Trait EI</i> (TEIQue-SF: Petrides & Furnham, 2006) 38-items CSE, measured by 4 scales; 10-items Self-esteem (Rosenberg, 1965); 8-items Locus of control (Levenson, 1981); 12-items Neuroticism, Eysenck & Eysenck, 1968); 8-items General Self-Efficacy, Judge et al., 1998) <i>Big 5 short version</i> : 10-items (TIPI: Gosling et al., 2003)	20-items <i>Positive/Negative Affect</i> (PANAS: Watson et al., 1988) 5-items <i>Satisfaction with Life Scale</i> (SWLS: Diener et al., 1985)
Study 2	Prospective Dental Students	N = 189	33-items trait EI (SEIS, Schutte et al., 1998); 12-items CSE (CSES: Judge et al., 2003); Self-concordant goal scale (PLOC: Sheldon & Elliot, 1998)	20-items <i>Positive/Negative Affect</i> (PANAS: Watson et al., 1988) 5-items <i>Satisfaction with Life Scale</i> (SWLS: Diener et al., 1985)
Study 3	Cross-sectional General Dental Practitioner (GDP)	N = 611	30-items <i>Trait EI</i> (TEIQue-SF: Petrides & Furnham, 2006) 12-items CSE (CSES: Judge et al., 2003) 30-items <i>Aspiration Index</i> (Kasser & Ryan, 1996)	20-items <i>Positive/Negative Affect</i> (PANAS: Watson et al., 1988) 5-items <i>Satisfaction with Life Scale</i> (SWLS: Diener et al., 1985) 18-items <i>Job in General Scale</i> (JIG: Ironson et al., 1989)

3. Study One

3.1. Introduction

The previous chapter argues that personality traits are consistent and powerful predictors of SWB (cf. section 2.7). Core traits such as the Big Five have been frequently associated with SWB components (Steel et al., 2008). One big disadvantage of the Big Five traits however is their heritable and stable nature with low sensitivity to environmental influences militates the prospect of change. Personal resources or surface traits on the contrary are moulded by core traits, but are more strongly affected by environmental influences (Asendorpf & Van Aken, 2003; Marsh et al., 2006; Hobfoll et al., 2003). This attribute led some authors to argue that personal resources (or surface traits) provide individuals' with a more flexible structures that allows them to 'control and impact upon their environment successfully' (Hobfoll et al., 2003). These adaptive features make them particularly useful for a dental school environment that is characterised by multiple stressors (Humphris et al., 2002; Alzahem et al., 2011).

However, it is important to first identify specific personal resources domains (surface traits) that are most likely to affect dental students' SWB. Research outside dentistry has shown that individuals' self-evaluations (CSE and trait EI) contribute to SWB because they determine self-worth and influence self-regulatory functions relating to goal setting and achievement (Austin et al., 2005; Erez & Judge, 2001; Mikolajczek, et al., 2008; Singh & Wood, 2008). These effects

are equally important in dental students, for whom positive self-evaluations underpin the technical and interpersonal aspects of their future roles (Chambers, 2001; Roeding, 2001; Chamberlain et al., 2005; Masella, 2007; Trathen & Gallagher, 2009).

As yet, there is little research about personal resources in dental education. Most research with regard to trait EI has focused on its effect on dental students' perceived stress (Pau et al., 2003, 2007). The questions of incremental validity over core personality traits and trait EI's influence on subjective well-being outcomes have not been investigated in dental populations. Findings with regard to CSE show that people with high core self-evaluations are more satisfied with their lives and experience more positive affect than with low CSE (e.g. Judge et al., 1998; Tsaousis et al., 2007). However, there is no existing research available of CSE effects in dental education despite its wide use in applied psychology. The aims of present study are therefore to investigate the following hypotheses.

3.2. Hypotheses

The CSE traits self-esteem (CSE-Self-esteem), self-efficacy (CSE- Self-efficacy), locus of control (CSE-Locus of control), and trait EI will positively correlate with PA and LS, and negatively with NA. CSE-Neuroticism on the other hand will inversely correlate with PA and LS, and positively with NA. Furthermore, the effects of CSE and trait EI on SWB components are expected to occur after the big five variables are controlled for (incremental hypothesis).

3.3. Method

3.3.1. Design

Using a cross-sectional survey, we examined relationships between CSE, trait EI and SWB in a sample of dental students. Independent variables were core self-evaluations (CSE), trait emotional intelligence (trait EI), and the big five factor model (Big Five). The primary dependent variables were subjective well being (positive/negative affect and life satisfaction).¹

3.3.2. Participants

Dental students from Liverpool Dental School (1st to 5th year Bachelor of Dental Surgery programme, *BDS*) were invited to participate in the study. Responses were obtained from 218 out of the 318 dental students (69% total response rate). The sample was composed of 58% female and 42% male participants, aged 18 to 41, with a mean age of 22 years (SD = 3.72).

¹ The terminology of independent and dependent variables is used for convenience in describing relationships that are causal in theory, but cannot be shown to be so in practice. The cross-sectional design used here precludes testing of causal effects.

3.3.3. Procedure

Participants were approached before regular undergraduate seminars and asked if they would like to participate. After obtaining consent, participants completed a paper-pen questionnaire either in or outside class and returned it to a drop box provided in the school office. Battery completion time took approximately 25 minutes. The questionnaires were completed sequentially in the order described below.

3.3.4. Measures

Core self-evaluations: The four CSE traits are based on established trait measures with high test-retest reliability and internal consistency described in the literature review (Judge et al., 1998; Judge et al., 2005). *Self-esteem* was measured with the 10-item Rosenberg self-esteem scale (Rosenberg, 1965). Generalised self-efficacy was measured with an 8-item scale developed by Judge et al. (1998). *Locus of control* was measured with the 8-item scale derived from Levenson (1981). *Neuroticism* was measured using the Eysenck Personality Inventory Neuroticism scale (Eysenck & Eysenck, 1968). Responses for all CSE scales were made on a 5-point Likert-type scale with responses ranging from 1 (strongly disagree) to 5 (strongly agree). Appendix (A) lists all inventories used in this study. The mean cronbach alpha coefficients for the four CSE scales were: CSE-self-esteem, $\alpha = 0.82$; CSE-general self-efficacy, $\alpha = 0.86$, CSE-locus of control, $\alpha = 0.78$, CSE-neuroticism, $\alpha = 0.88$.

Trait Emotional Intelligence: Trait EI was measured through the Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF, Petrides & Furnham, 2006). The inventory consists of

30-items responded to on a 7-point scale ranging from 1 (completely disagree) to 7 (completely agree). The TEIQue-SF questionnaire is based on the full 153-items TEIQue, but does not yield scores on the 15 trait EI facets. The Cronbach alpha reliability for the Total trait EI scale was $\alpha = 0.86$.

Ten Item Personality Inventory: This is a brief measure of the five factors of personality (McCrae & Costa, 1999). The authors report good levels of convergent and discriminant validity, as well as test-rest reliability (Gosling et al., 2003). The TIPI has been used in many studies. Furnham (2008) compared several brief personality measures and concluded that the TIPI achieved better validity than other brief personality measures. All items use the stem 'I see myself as' followed by ten pairs of two trait descriptors (e.g. extraverted, enthusiastic; sympathetic, warmth). Participants rate this on a 7-point Likert-type scale with possible responses ranging from 1 (disagree strongly) to 7 (agree strongly). The mean alpha value for the TIPI was expectable low, $\alpha = 0.52$, as only two items are typically used to measure the five core traits. A discussion of psychometric costs of Big Five short measures including the TIPI and benefits of their use can be found in Woods & Hampson (2005).

Subjective Well Being: SWB was measured by using the Satisfaction with Life scale (SWLS; Diener et al., 1985) and the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988). Both are among the most widely used SWB measures (see Diener et al., 1999). The five-item SWLS scale assesses participant's global, cognitive assessment of their life as a whole, using a seven-point Likert-like response format ranging from 1 (strongly disagree) to 7 (strongly agree). The PANAS includes 10 positive (e.g. happy, joyful, pleased) and 10 negative (e.g. depressed, frustrated, angry) adjectives. Participants indicate the extent to which they 'generally feel this way', using a response scale ranging from 1 ('very slightly/or not at all') to 5

(‘extremely’). Internal consistency reliabilities for PA and NA were in this study $\alpha = 0.85$ and $\alpha = 0.85$ respectively, and for life satisfaction $\alpha = 0.87$.

3.3.5 Ethical approval

Ethical approval for this study was obtained from both, the Faculty of Medicine/School of Dental Sciences, as well as the University of Liverpool Ethics Committee.

3.4. Results

Initial analyses: To identify demographic variables that might be a source of spurious correlation, we conducted a series of ANOVAs and Pearson correlations (Table 3.1) between study variables and age, gender and year level. Males scored more highly on CSE-N, but no other associations were noted. Spurious correlation was not seen to be a threat, and neither age, gender nor year level were included in further analyses.

TABLE 3.1

Bivariate Correlations between Gender, Year of Study and NA, LS, PA, Trait EI, and CSE

	Age	Year of Study	Gender
Negative Affect	-0.05	0.05	-0.13
Positive Affect	0.03	0.04	0.03
Life Satisfaction	-0.06	-0.04	0.01
Trait EI	0.05	-0.01	0.07
CSE-Neuroticism	-0.07	-0.06	-0.22**
CSE-Self-efficacy	0.10	0.05	0.05
CSE-Self-esteem	0.04	0.02	0.11
CSE-Locus of control	0.02	0.03	0.13

Note:

** $p < 0.05$

Descriptive statistics and correlations: Table 3.2 shows descriptive statistics (means and standard deviations) and Pearson correlation coefficients for all measures. The correlation matrix shows that trait EI and CSE-Self-esteem, CSE-General Self-Efficacy, and CSE-Locus of Control, and CSE-Neuroticism variables correlated with nearly all Big-Five traits (except for agreeableness that was only related to CSE-self-esteem) (Petrides et al., 2007b).

The correlation matrix further showed that, as predicted by hypothesis one (*H-1*), CSE-SE, CSE-Seff, CSE-Loc, and trait EI were positively correlated with PA and LS, and negatively with NA. CSE-N was inversely correlated with PA and LS and positively with NA.

TABLE 3.2

Descriptive Statistics and Bivariate Correlations between Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13
(1) Trait EI	--												
(2) CSE-Self-esteem	0.74**	--											
(3) CSE-Self-Effic	0.70**	0.83**	--										
(4) CSE-Loc Control	0.45**	0.43**	0.49**	--									
(5) CSE-Neuroticism	-0.61**	-0.60**	-0.60**	-0.35**	--								
(6) Extraversion	0.47**	0.35**	0.36**	0.15*	-0.35**	--							
(7) Conscientiousness	-0.34**	0.37**	0.39**	0.35**	-0.34**	0.13	--						
(8) Emot Stability	0.57**	0.60**	0.56**	0.31**	-0.65**	0.30**	0.28**	--					
(9) Openness	0.40**	0.32**	0.32**	0.28**	-0.14*	0.29**	0.16*	0.17*	--				
(10) Agreeableness	0.29**	0.17**	0.12	0.12	-0.11	-0.11	0.28**	0.12	0.19**	--			
(11) Pos Affect	0.55**	0.44**	0.46**	0.36**	-0.37**	0.37**	0.40**	0.34**	0.38**	0.28**	--		
(12) Neg Affect	-0.60**	-0.59**	-0.50**	-0.19**	-0.60**	-0.31**	-0.32**	-0.60**	-0.17*	-0.21**	0.22**	--	
(13) Lif Satisfaction	0.55**	0.56**	0.52**	0.35**	-0.42**	0.31**	0.24**	0.38**	0.20**	0.13	0.44**	0.40**	--
Mean	145.97	37.09	30.85	27.04	34.53	8.72	10.16	9.00	10.08	9.72	33.65	21.84	23.61
Standard Deviation	18.99	7.27	5.36	3.45	6.99	2.60	2.57	2.58	2.02	2.14	6.48	7.40	6.34

**, Significant at the 0.01 level (2-tailed)

*, Significant at the 0.05 level (2-tailed)

Trait EI = Trait Emotional Intelligence; CSE-Self-esteem = Self-Esteem; CSE-Self-effic = General Self-Efficacy; CSE-Loc Control = Locus of Control; Extraversion; Conscientiousness; Emot Stability; Emotional Stability; Openness; Agreeableness; Pos Affect = Positive Affect; Neg Affect = Negative Affect; Lif Satisfaction = Life Satisfaction

Hypothesis testing: The hypothesis was tested by conducting eight two-step hierarchical regression analyses predicting positive and negative affect and life satisfaction. Big Five variables were entered at the first step, then either trait EI or the three CSE variables in step two. An increase in explained variance demonstrates that step 2 variables predict SWB components independently of step 1 variables (cf. Cohen et al., 2003). Trait EI and CSE variables were entered into separate regression equations to ensure that shared co-variance (between Trait EI and CSE variables) did not reduce standardized beta weightings and obscure independent prediction attributable to each.

Table 3.3 shows that the addition of the trait EI significantly increased R^2 by 0.027 ($p < 0.01$) in prediction positive affect, negative affect, 0.045 ($p < 0.01$) and life satisfaction 0.103 ($p < 0.01$) over that afforded by the Big Five. Inspection of standardised regression weightings shows unique positive prediction of positive affect by trait EI ($\beta = 0.249$, $p < 0.003$), Extraversion ($\beta = 0.185$, $p < 0.004$), Conscientiousness ($\beta = 0.181$, $p < 0.007$), Openness ($\beta = 0.163$, $p < 0.007$); and positive prediction of LS by only trait EI ($\beta = 0.489$, $p < 0.000$).

TABLE 3.3

Hierarchical Regression Analyses predicting SWB from Big Five and Trait EI

	Positive Affect	Negative Affect	Life Satisfaction
Extraversion	0.19**	-0.06	0.06
Agreeableness	0.15	-0.08	-0.01
Conscientiousness	0.18**	-0.04	-0.004
Emotional Stability	0.50	-0.39**	0.09
Openness	0.16**	0.07	-0.02
<i>Step 1 ΔR^2</i>	0.37**	0.42**	0.21**
Trait EI	0.25**	-0.33**	0.49**
<i>Step 2 ΔR^2</i>	0.03**	0.05**	0.10**

Note: Standardised Betas (β) for Step 1 and 2 are shown as they appeared after Step 2.
* $p < 0.01$, ** $p < 0.001$

Table 3.4 shows that the addition of the CSE-traits significantly increased negative affect R^2 by 0.087 ($p < 0.01$), life satisfaction 0.142 (LS, $p < 0.01$) over that afforded by the Big Five. R^2 change did not reach significance for PA (0.027, ns, $p > 0.059$). Inspection of standardised regression weightings shows unique positive prediction of LS by CSE-Self-esteem ($\beta = 0.351$, $p < 0.001$). In addition, there are predictions of NA by CSE-self-esteem ($\beta = -0.29$, $p < 0.001$) and CSE-locus of control ($\beta = 0.13$, $p < 0.01$).

TABLE (3.4)

Hierarchical Regression Analyses predicting SWB from Big Five and CSE Variables

	Positive Affect	Negative Affect	Life Satisfaction
Extraversion	0.16**	0.16	0.16
Agreeableness	0.18**	0.19*	0.18
Conscientiousness	0.16**	0.17	0.16
Emotional Stability	0.19	0.20**	0.19
Openness	0.20**	0.21	0.20
<i>Step 1 ΔR^2</i>	0.37**	0.42**	0.21**
CSE-Self-Esteem	0.03	-0.29**	0.35**
CSE-Neuroticism	0.05	0.25**	-0.07
CSE-General-Self-Eff.	0.11	0.05	0.11
CSE-Locus of Control	0.10	0.13*	0.11
<i>Step 2 ΔR^2</i>	0.03	0.09**	0.14**

Note: Standardised Betas (β) for Step 1 and 2 are shown as they appeared after Step 2.
 * $p < 0.01$, ** $p < 0.001$, ns = not significant

3.5. Discussion

Although some studies have examined the incremental of trait EI and CSE measures on different outcomes including SWB, this was the first empirical study to examine the incremental validity of CSE and trait EI on subjective well-being outcomes in dental students. Overall, findings confirmed the predictive value of CSE and trait EI for SWB beyond the big five variables.

The question of incremental validity is not a trivial one if one considers that CSE and trait EI are postulated to represent surface traits that underlie influences of core personality traits. Chapman and Hayslip (2005) note in this context that ‘the usefulness of a new construct often lies in its ability to predict theoretically relevant outcomes not already predicted by existing constructs’. If this approach is taken as a serious benchmark for testing surface traits, than it is essential to control for core personality traits when studying effects of related but distinct surface traits on outcomes. Dental research have utilised measures of self-report trait EI (e.g. Pau et al., 2003, 2007), but have never controlled for variance caused by core personality traits (incremental validity test). This constitutes a limitation of presented evidence as results may have not had occurred if well-established core personality variables were controlled (cf. Bracket & Mayer, 2003; Schulte et al., 2004).

Accordingly, the current study was the first in dentistry to assess the incremental validity of CSE and trait EI over core personality traits across all three components of subjective well-being. Taken as a whole, results indicate that the Big Five measures capture most of the variance in SWB components. CSE and trait EI were able to explain additional unique variance between 2.7% and 14.2%. Although the incremental values seem small, it is substantial because CSE and trait EI have been regressed second, and because ‘incremental values between 1% and 5% over

well-established constructs is meaningful' (Gallagher & Vella-Brodrick, 2008, p.1558). These positive findings about incremental validity are also in accordance with reported values found in the general literature (Singh & Wood; 2008; Gallagher & Vella-Brodrick, 2008; Judge et al., 1998; 2005; Klumper, 2008; Piccolo et al., 2005; Petrides et al., 2007b).

More specifically, findings supported the predictive power of trait EI for affective and cognitive components of SWB. That is, trait EI predicted additional incremental variance beyond the big five traits in PA (2.7%) and LS (10.3%). CSE predicted variance in life satisfaction (14.2%), but not positive affect, although results were close to significance (ΔR^2 , ns, $p > .059$). When the regression model for life satisfaction was inspected in more detail, findings revealed that only CSE-self-esteem exhibiting a significant beta-weight and none of the Big Five traits. This finding can be linked to a number of past studies that showed that particularly individuals with higher self-esteem tend to enjoy higher levels of well-being than individuals with lower self-esteem (e.g. Kwan et al., 1997). For example, Diener & Diener (1995) reported in a large general student sample from 34 countries a positive correlation between self-esteem and life satisfaction. High self-esteem has in addition been recognised to be a protective factor against stress in dentists and dental students (Mozer & Lloyd, 1992; Winwood et al., 2003; Rada & Johnson-Leong, 2004).

In conclusion, the present study found that surface traits representing self-evaluative processes appear to play a significant role for SWB levels in dental students. However, we do not yet know whether positive self-evaluations are sufficient to ensure well-being, or that further processes are required to mediate the effect. Positive self-appraisal might directly enhance SWB, as self-confidence is generally seen as an asset to dental students. Further possibility raised and discussed in section 2.10 of the literature review is that self-appraisals

influence motivational mechanisms such as goal setting and attainment, which exert proximal influences on SWB (Judge et al., 2005; Johnson et al., 2008; Spence et al., 2004). The next empirical study will therefore explore the latter possibility of a meditational pathway that may explain the effects of CSE/trait EI on SWB.

4. Study Two

4.1. Introduction

Results from study one showed that CSE and trait EI measures can explain variance in SWB variables, beyond the effect of the Big Five variables, in dental students. However, there is a limited understanding of the mechanism responsible for these associations. One theoretical framework that may provide a useful theoretical framework for this evaluation is those derived from self-determination theory (Deci & Ryan, 2002). Self-determination theory is a motivational theory that emphasises particularly the role of different types of goals and their effects on well-being. Importantly, past research shows that motives underlying personal goals possibly explain the link between personal resources and well-being (Judge et al., 2005; Spence et al., 2004; cf. sections 2.10.4.1 & 2.10.5).

4.1.1. The self-concordance model and subjective well-being

One model within self-determination theory that is particularly concerned with the motives or reasons behind goal striving is the self-concordance model (Sheldon & Elliot, 1999). Self-concordance refers to the extent to which goals are pursued for autonomous or identified

reasons, thus representing people's choice and interests (Sheldon, 2002). Disconcordant goals refer to the extent to which people feel compelled to pursue a goal by internal (e.g. feelings of guilt and shame) or external forces (e.g. significant others) (Chatzisarantis et al., 2008). Specially, self-concordant goals have been found to affect well-being positively, as they (1) enable people to put sustained effort into their goals (2) facilitate more likely goal progress and attainment, and (3) satisfy basic psychological needs of competence, relatedness, and autonomy during the period of striving (Sheldon, 2002; cf. section 2.10.3).

4.1.2 Self-concordant goals and dental students

Applying the self-concordance model to dental students to understand their subjective well-being is justifiable for two reasons. First, despite research showing strong support for the link between self-concordant goals and different well-being indicators including SWB (e.g. Sheldon & Houser-Marko, 2001), there is no empirical research that has tested such claims among dental students. Second, recent studies indicate that dental students, whose first career choice was not dentistry, experienced more stress during dental school than those students who selected dentistry as their first choice (Acharya, 2003; Sugiura et al., 2005; Pau et al., 2007). This phenomenon could well be accounted for by the self-concordance theorem, as career choice represents an example of a long-term commitment requiring goal effort of the student in daily goal pursuit. Perceiving dental school as stressful could possibly be related to motive-incongruent goal progress (often referred to as 'intrapersonal conflict'; Sheldon & Kasser, 1998). Evidence indicates in this regard that incongruent goal progress can result in reduced well-being and depressivity (Dickson & McLeod, 2004; Sheldon, 2002; Pueschel et

al., 2010). Given the powerful effects of goal motives on levels of well-being, it is of interest whether concordant goal striving contribute to dental students' well-being. The present study sought therefore to examine more closely the claimed positive effects of self-concordant goal pursuit on dental students' subjective well-being (Hyp-1).

4.1.3. Linking self-concordant goals to personal resources and subjective well-being

Second, since pursuing self-concordant goals are linked to numerous positive consequences, it is of interest to detect underlying factors for adopting specifically congruent personal goals. Most of the research that attempted to address this question has focused on factors related to environmental factors (e.g. Kasser et al., 1995; Sheldon & Kasser, 2008; Kasser et al., 2002) or to core personality traits (Turban et al., 2007). New findings, however, indicate that personal resources such as CSE and trait EI also influence whether we adopt self-concordant goals (Spence et al., 2004; Judge et al., 2005). Reasons for this link are attributable to characteristics of trait EI and CSE. In particular, high trait EI/CSE individuals are thought to be more proactively oriented, emotionally confident, and possess high control beliefs (cf. sections 2.10.4.1 & 2.10.5, and, Petrides et al., 2007a; Judge & Hurst, 2007). Such people should have a better insight into emotional processes, be more likely to resist social and cultural pressure and therefore, set goals consistent with their own values, beliefs, and motives. Pursuing such self-concordant goals should in turn not only help those individuals to stay more committed to their goals, but importantly, increase their levels of well-being. Accordingly, the second aim of this study is to demonstrate that goal self-concordance can add knowledge to our understanding of how personal resources influence subjective well-

being. More specifically, goal self-concordance was hypothesised to mediate the relationship between personal resources (CSE/trait EI) and subjective well-being (Hyp-2 and Hyp-3).

4.1.4. The present study

To summarise, this study was guided by two main objectives: First, to extend previous research by applying the goal self-concordance model to dental students' subjective well-being. Second, to test a mediational model that connects CSE/trait EI to subjective well-being through goal self-concordance. All study hypotheses are presented in more detail below.

4.2. Hypotheses

- (1)** Goal self-concordance will be positively related to positive affect, life satisfaction, and inversely related to negative affect.
- (2)** Goal self-concordance will positively mediate the path between trait emotional intelligence, positive affect and life satisfaction.
- (3)** Goal self-concordance will positively mediate the path between CSE, positive affect and life satisfaction.

4.3. Methods

4.3.1. Design

To study the influence of personal resources and personal goals on subjective well-being, a study across two time-points was conducted. As most goal researchers assume that effects of goal thriving on well-being unfold through time, a research design was employed that takes this longer time frame into account (e.g. two months). Accordingly, at time one (T1), the related measures independent variables were obtained, that is, core self-evaluations (CSE), trait emotional intelligence (trait EI) and goal self-concordance (RAI). At time two (T2, two months later), the primary dependent variables were obtained, that is, subjective well being (positive/negative affect and life satisfaction). The sample size has been set at close to 200, a recommended figure for a 'medium effect size' in single mediation model (McKinnon et al., 2002; Fritz & MacKinnon, 2007).

4.3.2 Participants

Dental students from Liverpool Dental School (second, third, fourth, and fifth year Bachelor of Dental Surgery programme, BDS) were invited to participate in the study. Overall, 189 (out of 301) dental students, 51.1% male and 47.9% female, completed both the Time 1 (N =

214) and Time 2 (N = 189) self reported questionnaire, representing a total response rate of 63%. Participants ranged in age from 19 to 40, with a mean age of 22.7 years (SD= 3.91).

4.3.3. Procedure

4.3.3.1. Time 1

All students were initially approached whilst attending the University for a lecture. The background to the study was outlined in a five minute oral presentation by the researcher. The opening instructions described the study as an investigation into 'Students' Well-Being'. They described the time frame (Time 1 questionnaire; Time 2 questionnaire after 60 days) and outlined the study procedure. Emphasis was placed on explaining 'personal goals' and examples were presented. The information regarding the study was also given in a written format on an information sheet (cf. Appendix B). Consent forms were distributed together with the Time 1 questionnaire. Students were invited to complete the questionnaire whilst in the lecture theatre. To preserve anonymity a coding system was used. A randomly allocated number was pre-allocated to each participant and the file linking numbers to participants was stored separately from participant data.

Follow up of non-responders was carried out due to low attendance at lectures. All students (2nd to 5th year) were first approached by email and invited to take part, then excluded from the participant list. Students were in addition visited during their small group seminar classes, and those who had not completed the questionnaire were invited to do so.

4.3.3.2. Time 2

Participants were re-approached in lectures after 60 days for time point two. The participants were briefly reminded about the study. Goals completed at time 1 were handed back to individual students (attached to time 2 questionnaire) together with a Time 2 questionnaire to be completed. The attached goal list was given to remind students of the goals they had enlisted in the Time 1 questionnaire. Finally, contact numbers of the investigators were given out and participants were encouraged to approach the investigators for the results of the study.

4.3.4. Measures

4.3.4.1. Time 1

Trait Emotional Intelligence. Trait EI was measured with the Schutte Emotional Intelligence Scale (SEIS: Schutte et al., 1998). The SEIS consist of 33 items, three of which (5, 18, 33) are reverse-scored. Participants responded on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). The possible range of scores is 33 to 165. The scale has been used extensively in the literature (cf. Schutte et al., 2009). Example items include, 'I expect that I will do well on most things I try', 'I am aware of my emotions as I experience them', 'I like to share my emotions with others'. The cronbach alpha reliability for the Total EI scale was $\alpha = 0.69$. The scale was further factor analysed and results for that are reported in the measurement sub-section of the results. *Appendix (A)* lists further all measures used in study two.

Core-self-evaluations. The 12-item core self-evaluations scale was used to assess the core self-evaluation construct (CSES: Judge et al., 2003). The CSES has been developed to operationalise the construct in a shorter version. Judge et al. (2003) report that the 12-item CSES displayed acceptable levels of internal consistency and test-retest reliability (cf. section 2.8.3). It has lately been applied in a study of subjective well-being and physical/psychological health (Tsaousis et al., 2007). Example items include, 'Sometimes when I fail I feel worthless' and 'I determine what will happen in my life'. Responses were anchored on a 5-point Likert-type scale with responses ranging from 1 (strongly disagree) to 5 (strongly agree). The scale items were summed and accordingly reversed coded. The cronbach's alpha coefficient for CSES total score was $\alpha = 0.82$.

Personal Goals. Consistent with past research (e.g. Sheldon & Elliot, 1998; Judge et al., 2005), participants were asked to generate four short-term life and work goals that can be accomplished in two months. These goals were assessed through a personal project approach (cf. Little, 1993; Little, 2007), where personal projects are defined as 'goals and concerns that people think about, plan for, carry out, and sometimes (though not always) complete or succeed at'.

4.3.4.2. Goal self-concordance

In keeping with previous self-concordance research (Koestner et al., 2002; Sheldon & Elliot, 1999), participants were asked to answer four items for each of their listed personal projects (total of 16 items). This procedure is based on the *perceived locus of causality method* in which each item represents one of the four types of goal regulation process (*PLOC*: Ryan & Connell, 1989; Sheldon, 2002). The four different reasons are: '*because somebody else*

wants you to, or because you'll get something from somebody if you do – you probably would not do this if you didn't get some kind of reward, praise, or approval for it' (external); 'because you would feel ashamed, guilty, or anxious if you didn't – you feel that you ought to strive for that something' (introjected); 'because you really believe that it is an important goal to have – you endorse it freely and value it wholeheartedly' (identified), and 'because of the fun and enjoyment which the goal provides you. – the primary reason is simply your interest in the experience itself' (intrinsic). Ratings were made on a 5-point Likert type-scale ranging from 1 (strongly disagree) to 5 (strongly agree).

In keeping with previous research (e.g. Sheldon & Elliot, 1999), the present study calculated a Relative Autonomy Index (RAI), by first summing across the intrinsic and identified rating the person makes for each of his or her personal projects, and then, by subtracting the external and introjected ratings. This procedure results in a self-concordance composite variable (RAI). Next, alpha coefficients were calculated for this composite measure (cf. Sheldon et al., 2004, p.478) as well as the four motivational sub-factors. The alpha coefficient for the RAI composite measure was $\alpha = 0.62$. Reliabilities for the four sub-factors were: Identified ($\alpha = 0.50$); Intrinsic ($\alpha = 0.53$); External ($\alpha = 0.64$); Introjected ($\alpha = 0.71$).

4.3.4.3. Time 2

Subjective Well-being. In line with study one, subjective well being was measured by using the Satisfaction with Life scale (Diener et al., 1985) and the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988).

Life satisfaction was measured with five items; 'In most ways my life is close to ideal'; 'The conditions of my life are excellent'; 'I am satisfied with my life'; 'So far I have gotten the important things I want in life', and 'If I could live my life over, I would change almost nothing'. Participants responded on a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). All five items were summed. The cronbach alpha reliability for this scale was $\alpha = 0.83$.

Positive/Negative Affect was measured with the PANAS which includes 10 positive (e.g. happy, joyful, pleased) and 10 negative (e.g. depressed, frustrated, angry) adjectives. Participants are asked to indicate the extent to which they experience these adjectives in general using a response scale ranging from 1 (very slightly/or not at all) to 5 (extremely). The positive and negative affect scales each have a potential range of 10-50, where higher scores indicate higher affect. The scores of each factor were summed. Cronbach alpha reliabilities for the PA and NA scales were $\alpha = 0.85$ and $\alpha = 0.84$, respectively.

4.3.4.3. Ethical approval

Ethical approval for this study was obtained from both, the Faculty of Medicine/School of Dental Sciences, as well as the University of Liverpool Ethics Committee. To ensure the participants that ethical procedures were followed, verbal and written information stating this was given on first contact.

4.3.5. Results

4.3.5.1. Preliminary analysis

A preliminary analysis of the underlying factor structure of the 33-items Schutte Emotional Intelligence Scale (SEIS: Schutte et al., 1998) was carried out. This approach was considered as a critical pre-analytic step due to mixed findings of reported factor solution in the literature (e.g. Austin et al., 2004). One recommended way to overcome this structural problem is to factor analyse the SEIS scale before using it (cf. Petrides & Furnham, 2000). Accordingly, a principal components analysis (PCA) with SPSS Version 18 was performed. Prior to performing the PCA, the factorability of the correlation matrix was checked by examining values of the Kaiser-Meyer-Okin Measure of Sampling Adequacy ($KMO = 0.73$, thus greater than 0.5) and Bartlett's Test of Sphericity (significant on $p < 0.001$) (cf. Field, 2005). This was followed by a principal component analysis. Initial results of the PCA showed the presence of eleven factors with eigenvalue exceeding 1.0 (according to the *Kaiser-Guttman rule*, only factors with eigenvalue of 1.0 or more are retained). An inspection of the screeplot shape (Figure 4.1) indicated a possible break after the third or fourth factor. After using Catell's (1966) scree test and item content analysis, it was further decided to retain three factors. This decision was additionally supported by the fact that four factors were not readily interpretable, whereas three factors did appeared so, and further accounted for a reasonable amount of variance.

The three-factor solution explained a total variance of 30,0%, with Factor 1 contributing 16.4%, Factor 2 contributing 7.4%, and Factor 3 contributing 6.1%. To aid in the interpretation of the three factors, Oblimin rotation was performed. This rotation method was favoured over a strictly orthogonal one (Varimax rotation) as factors were expected to relate to each other. The rotated solution revealed three factors which were subsequently labelled

according to the highest loading items in each factor (Pallant, 2007), that is: (1) *Recognising Others Emotions*; (2) *Capacity to initiate/Monitor Positive Mood*; (3) *Emotionality*. Correlations between the three factors are presented in table (--).

Taken together, results of the PCA analysis supported the use of a three-factor solution for the 33-items SEIS scale and not a single factor solution as recommended initially by Schutte et al., (1998). This result is in line with recent findings about a three-factor solution (e.g Austin et al., 2004).

FIGURE 4.1 Results of principal component analysis (PCA)

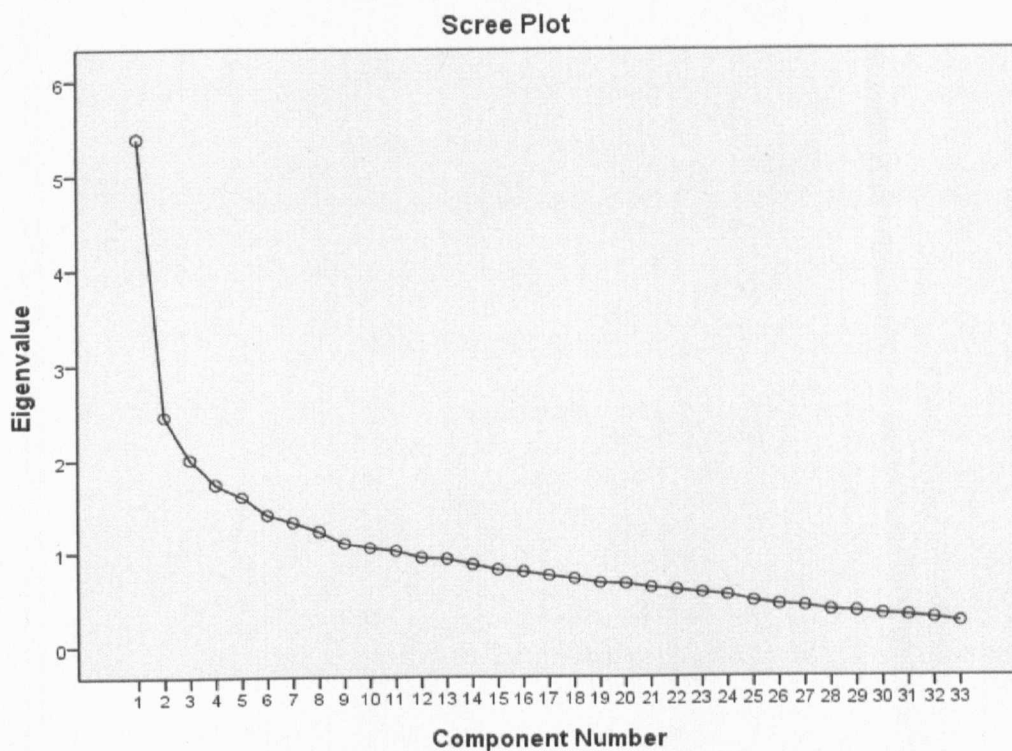


TABLE 4.1

Eigenvalues, Percentage of Variance, and Cumulative Percentages for Factors of the 33-item SEIS Scale

Factor	Eigenvalue	% of variance	Cumulative %
1	5.40	16.35	16.35
2	2.46	7.44	23.79
3	2.01	6.08	29.87

TABLE 4.2

Summary of Factor Loadings for Oblimin Three-Factor Solution for the 33-items SEIS Questionnaire

Item Number	Factor Loading		
	1	2	3
1		.507	
2		.393	
3		.389	
4	.439		
5	.690		-.340
6	.303		
7			
8			.390
9		.446	
10		.442	
11		.482	.314
12		.685	
13		.525	
14		.545	
15	.525		
16		.365	
17	.379		
18	.700		
19		.500	
20	.352		
21		.437	
22		.526	
23			
24			
25	.697		
26			.601
27			.353
28			-.460
29	.688		
30	.362		
31			.443
32	.651		
33	.395		-.487
	Factor correlations		
Factor 1	--	.269	.099
Factor 2	.269	--	.040
Factor 3	.099	.040	--

Note: Only factor loadings higher than |.3| are presented. Item numbers correspond to those in Schutte et al. (1998)

4.3.5.2. Correlational analysis

Following preliminary analysis, descriptive statistics and correlations were analysed next. To avoid spurious correlations attributable to demographics (age, gender) and sample specific factors (year of study), relationships between main study variables and age, gender, and year of study were first examined. Table 4.3 shows bivariate correlations.

TABLE 4.3

Bivariate Correlations between Gender, Year of Study and NA, LS, PA, Trait EI, and CSE

	Age	Year of Study	Gender
NA	-0.08	0.23**	-0.18
PA	0.04	0.02	0.24**
LS	-0.07	-0.05	0.06
CSE	-0.03	-0.15*	0.27**
Recognising Other's Emotions	0.13	-0.05	-0.23**
Capacity to initiate/ Monitor Positive Mood	0.05	-0.06	0.03
Emotionality	0.10	0.26**	-0.11
RAI	0.09	0.00	-0.17*

Note:

* $p < 0.01$ ** $p < 0.05$

Several correlations were observed between demographic and study variables. Based on the above results and to keep the risk of spurious correlations to a minimum, age, gender, and year of study were controlled for in subsequent analysis. Table 4.4 presents the means, standard deviations, and partial correlations of all study variables.

TABLE 4.4

Partial Correlations between all Study Variables Controlling for Age, Year of Study and Gender

	CSE	TEI	RAI	Ext	Introj	Ident	Intrin	PA	NA	LS	F1	F2	F3
	1	2	3	4	5	6	7	8	9	10	11	12	13
(1) CSE	--												
(2) Total EI	0.37**	--											
(3) RAI	0.29**	0.21**	--										
(4) External	-0.20**	-0.15*	-0.73**	--									
(5) Introjected	-0.32**	-0.08	-0.60**	0.35**	--								
(6) Identified	-0.02	0.12	0.37**	-0.06	0.25**	--							
(7) Intrinsic	0.09	0.15*	0.58**	-0.11	-0.05	0.38**	--						
(8) Positive Affect	0.31**	0.31**	0.15*	-0.05	-0.01	0.10	0.25**	--					
(9) Negative Affect	-0.48**	0.03	-0.20**	0.16*	0.24**	0.07	-0.08	-0.22**	--				
(10) Life Satisfaction	0.45**	0.23**	0.08	-0.06	-0.10	-0.10	0.09	0.31**	-0.35**	--			
(11) Recognising Other's Emotion	-0.18*	0.67**	0.16*	-0.08	-0.01	0.16*	0.17*	0.12	0.05	0.06	--		
(12) Capacity to initiate /Monitor Positive Mood	0.55**	0.72**	0.22**	-0.20**	-0.18*	0.02	0.06	0.35**	-0.20**	0.32**	0.23**	--	
(13) Emotionality	-0.18*	0.20**	0.06	0.07	0.06	0.12	0.21**	0.16*	0.22**	-0.12	0.09	0.00	--
Mean	42.3	122.4	7.1	9.9	13.6	16.2	14.3	30.4	21.6	23.9	--	--	--
Standard Deviation	6.0	10.5	7.2	3.4	3.5	2.3	2.8	6.8	7.4	5.7	--	--	--

Note:

*Significant at the 0.05 level (2-tailed). ** Significant at the 0.01 level (2-tailed).

CSE = Core self-evaluations; Total EI = Total trait measure; RAI = Self-concordance composite; Fact1 = Recognising Others Emotions; Fact2 = Capacity to initiate/monitor positive mood; Fact3 = Emotionality

N = 186

4.3.5.3. Self-concordant goals and dental students' subjective well-being

The partial correlation revealed that the self-concordance composite (RAI) was correlated with positive affect ($r = 0.15, p < 0.05$) and negative affect ($r = -0.20, p < 0.01$). This result supports hypothesis one (Hyp-1) and the claim that goal pursuit for self-concordant motives positively influences affective well-being. Of interest is further the relation between the four subscales (intrinsic/identified/introjected/external) and affective well-being. Consistent with expected direction, the correlations reveal that whereas the more autonomously chosen goals (intrinsic/identified) typically had positive and significant correlations with positive affect, the 'controlled' (introjected and extrinsic) goals typically had nonsignificant correlations with these variables. The same patterns of relations were evident concerning negative affect. However, contrary to expectations, and findings by Judge et al. (2005) and Gregura & Diefendorff (2010), results here do not support a link between self-concordance and life satisfaction ($r = 0.08, ns$).

4.3.5.4. Personal resources and self-concordant goals

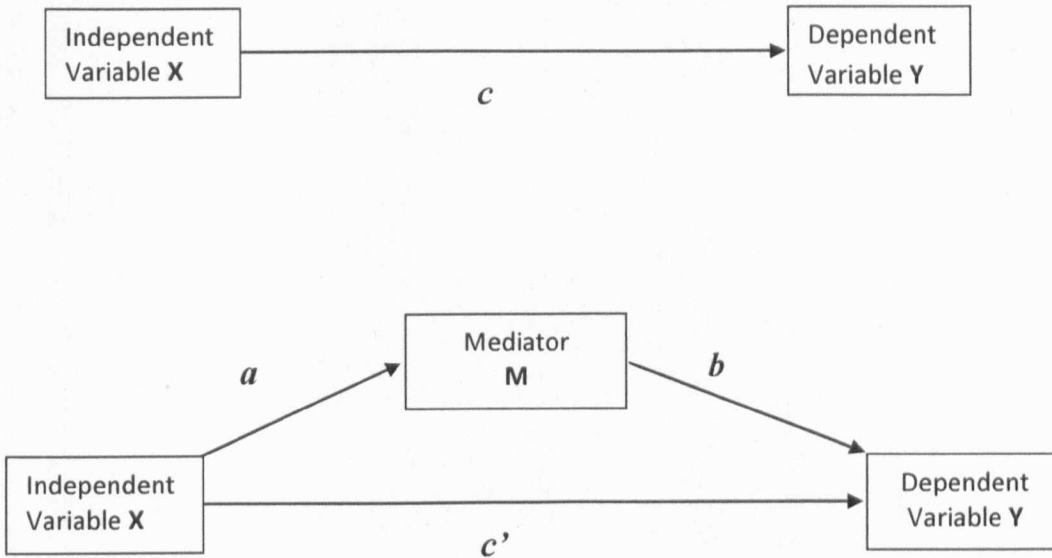
The trait EI factors 'recognising others emotions' and 'capacity to initiate/monitor positive mood' also revealed patterns of correlations that were consistent with expectations. Specifically, higher scores on 'recognising other's emotions' and 'capacity to initiate/monitor positive mood' corresponded to higher ratings for self-concordant goals ($r = 0.16, p < 0.05$ and $r = 0.22, p < 0.01$, respectively). A positive pattern was also found for CSE. That is, higher scores on CSE corresponded to higher ratings on self-concordant goals ($r = 0.29, p < 0.01$).

These results provide further support for a relationship between personal resources and self-concordant goal pursuit consistent with previous findings (Spence et al., 2004; Judge et al., 2005).

4.3.5.5. Linking self-concordant goals to personal resources and subjective well-being

Mediation was tested where two essential requirements were met (MacKinnon et al., 2002). First, the c path must be significant, that is, the relationship between the independent variable (X) and the dependent variable (Y) must be significant. Secondly, the mediator must be correlated with both the independent and the dependent variables. Generally, full mediation is established when a and b paths are significant and c is not. If the mediated effect ($a \times b$) and the direct effect (c) are both significant and point at the same direction, then partial mediation should be concluded as a result (Zhao et al., 2010). Figure 4.2 shows a schematic process of a general single-mediation model with related paths and algebraic signs.

FIGURE 4.2: Single-mediator model



adopted from McKinnon et al. (2002, p.86)

The partial correlation matrix (Table 4.4) was checked against these two requirements. And correlations were found between self-concordance, trait EI factor ('Capacity to initiate/monitor positive mood'), CSE, and positive affect. To determine next whether self-concordant goals mediate the relation between the aforementioned independent and dependent variables, that is, whether the product of the indirect pathways ($a \times b$) is significant, two bootstrapping analysis were subsequently performed based on 5000 bootstrap samples (Preacher & Hayes, 2008). The bootstrapping method has been recommended in the recent psychometric literature to test for mediation effect for small to moderate sample sizes (MacKinnon et al., 2007; Shrout & Bolger, 2002; Zhao et al., 2010). To reduce the possibility

of confounding effects, age, gender, and year of study were additionally controlled in each tested model.

To conduct a bootstrapping method, an SPSS macro developed by Preacher & Hayes (Hayes, 2008) was used. It generates an SPSS command that can be used to calculate bootstrap confidence intervals for total and specific indirect effects of X on Y through a one or more mediator variable(s) M .

Table 4.5 summarises the results of the two bootstrap analyses. An examination of the indirect effects indicated that neither mediation model (Model 1-2) was significant. Interpretation of the bootstrap data is accomplished by determining whether zero is contained within the 95% Confidence Intervals (CI). Since the 95% CI contained zero, it was concluded that self-concordance did not mediate the relationship between trait EI (Factor 2)/CSE and positive affect. In sum, the bootstrap analysis indicates that self-concordance did not mediate the link between trait EI (Factor 2), core self-evaluations, and affective well-being (positive affect).

TABLE 4.5

Simple Mediation of the Indirect Effects of Factor 2/CSE on Positive Affect Through Changes in Goal Self-Concordance (N = 186); 5000 Bootstrap Sample)

Model	Independent variable	Mediating variable	Dependent variable	Point Estimate Indirect Effect (a x b)	BCa* 95% CI	
					Lower	Upper
(1)	Trait EI Factor 2	RAI	Positive Affect	0.02	-0.0111	0.0569
(2)	CSE	RAI	Positive Affect	0.02	-0.0196	0.0682

Note:

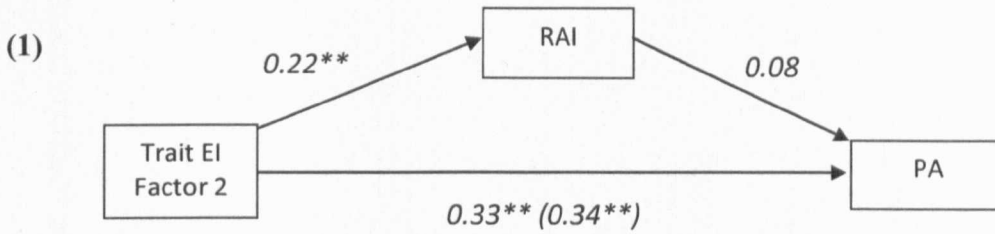
*BCa = bias corrected and accelerated bootstrapping confidence intervals. Confidence intervals containing zero are interpreted as none significant.

*Significant point estimate ($p < 0.05$).

CSE: Core self-evaluations

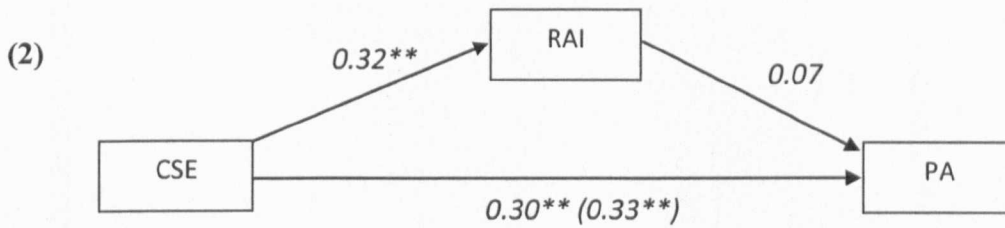
Trait EI Factor 2: Capacity to initiate/Monitor Positive Mood

FIGURE 4.3: Bootstrapping results for trait EI



Note: Path values represent standardised regression coefficients. The value inside of the parentheses represents the total effect of trait EI (Factor 2) on PA prior to the inclusion of the mediating variable (RAI). Values outside of the parentheses represent the direct effect from bootstrapping analysis of trait EI (Factor 2) on PA after the mediators are included. * $p < 0.05$. ** $p < 0.01$.

FIGURE 4.4: Bootstrapping results for CSE



Note: Path values represent standardised regression coefficients. The value inside of the parentheses represents the total effect of CSE on PA prior to the inclusion of the mediating variable (RAI). Values outside of the parentheses represent the direct effect from bootstrapping analysis of CSE on PA after the mediators are included. * $p < 0.05$. ** $p < 0.01$.

4.4. Discussion

The present study was guided by two aims: First, to extend previous research by applying the goal self-concordance model to dental students' subjective well-being. Second, to identify the mechanism underlying the relationship between personal resources and SWB. Meaningful relations were found between CSE/trait EI factors and the self-concordance composite measure. Notably, when dental students choose goals for self-concordant reasons, they experienced stronger increase in positive affect, but no increase in life satisfaction. There was no support for the hypothesis that goal self-concordance mediates the relation between personal resources and subjective well-being.

4.4.1. Self-concordant goals and dental students

This study provides the first empirical test of self-concordance theory in a sample of undergraduate dental students. Results showed that dental students who pursued more autonomous self-generated personal goals had higher affective well-being (PA) scores than students who adopted goals for external reasons. Given that self-concordant goals represent explicit motive and interest (Sheldon, 2002), it seems plausible that these type of goals were more strongly integrated into dental students' personal goal system. Theory and empirical findings suggest in this regard that self-integrated goals are more likely to facilitate goal progress and positive change as people put more sustained effort into their goals (Sheldon, 2002; Koestner et al., 2002). Furthermore, as congruent goal strivers experience more

feelings characterised by task competence, self-agency, and interpersonal relatedness (the three basic needs) (Sheldon & Elliot, 1999), it seems plausible that dental student's positive well-being were related to both, goal progress and need satisfaction experiences. This line of reasoning is also in accordance with findings in the goal literature (Sheldon & Schmuck, 2001; Sheldon, 2002; Koestner et al., 2002; Wiese, 2007).

4.4.2. Linking self-concordant goals to personal resources and subjective well-being

Previous research has posited that CSE and trait EI relate to outcomes because they influence goal motivation. The present study extended this line of research by exploring personality effects of core self-evaluations and trait EI on self-concordance and subjective well-being of dental students. Findings with regard to CSE showed, similarly to previous work (Judge et al., 2005), a significant association with goal self-concordance. In other words, dental students who perceived themselves as worthy, efficacious, and in control of their lives (positive core self-evaluations) were also more likely to set personal goals for intrinsic reasons. A similar positive pattern was found for the relation between trait EI and goal self-concordance. Most notable about the trait EI finding was that only factor two related strongly to goal self-concordance. As factor two encompasses particularly items related to the capacity to initiate/monitor positive mood (Factor two: e.g. 'When I experience a positive emotion, I know how to make it last'; 'I seek out activities that make me happy'), it seems as if high scorers' on this subscale were also more inclined to endorse congruent goals.

Sheldon and Houser-Marko (2001, p. 162) note that self-concordant goal selection requires 'accurate self-perceptual abilities and the ability to resist social pressures'. Given that CSE and trait EI's inherent characteristics meet these requirements (cf. discussion in sections

2.10.4.1 & 2.10.5), it is reasonable to suggest that dental students with strong personal resource capacities also set and pursue more likely self-concordant goals.

Contrary to expectations, the present results could not support the hypothesis that self-concordant goal motivation accounts for the effect of CSE/trait EI on subjective well-being (H-2 and H-3). This finding was surprising given that prior work has demonstrated that such a motivational link possibly exists (Judge et al., 2005; Ferris et al., 2011). Although a theoretical shortcoming is a potential explanation for the lack of significant results (this point is discussed in more detail in the general discussion), it is also possible that study specific reasons may account for this. Dental students are a specific cohort of students and less familiar with goal related research. One piece of evidence that substantiate this interpretation is the low intercorrelations between the four rated personal goals. Findings in this regard indicate that intercorrelations were specifically weak for the last eight goal items. This suggests in turn that participants may have experienced this part of the survey as too effortful or repetitive.

As this group of students is naturally under heavy time constrain due to a demanding timetable, and goal choice is heavily influenced by these demands, it might be more appropriate to use a pre-defined (nomothetic) goal list measure in future research. Such a pre-devised goal method is argued by some to have not only practical advantages over open (ideographic) goal measures, but it also allows for a more accurate response comparison between studies (Massey et al., 2008).

To conclude, although some of the hypothesised relationships were not found to be significant, results from the correlation analyses were very encouraging. These initial results suggest that a) self-concordant goals positively influence affective well-being, and b) that CSE and trait EI facilitate the selection of self-concordant goals.

5. Study Three

5.1. Introduction

Findings of the first two studies have shown that a) core self-evaluation and trait emotional intelligence predict variance in dental students subjective well-being, and b) self-concordant goal pursuit do not mediate the relationship between these two personal resources and SWB. Study three was designed to extend this line of inquiry in three ways: First, by investigating the relationship between personal resources and work-well-being in a registered dentist population; second, by studying associations between dentists intrinsic goal contents (relative to extrinsic) and work well-being, and third, by testing whether relative intrinsic goals mediate the relation between CSE/trait EI and dentists work well-being.

5.1.1. Work well-being

While the first two studies focused on dental students' well-being, study three sought to investigate the association between personal resources and work well-being in dental practitioners. Work well-being is one of the most important criterion variables in

organisational psychology (Hassan et al., 2009; Dana & Griffin, 1999; Schulte & Vainio, 2010). Following recent conceptualisations of work well-being, it is understood as a broader concept that includes both, context-free measures such as life satisfaction and general affect (positive/negative affect) as well as work-related experiences such as job satisfaction (Danna & Griffin, 1999; Page & Vella-Brodrick, 2009).

Work well-being is considered as a core part of professional development (Warr, 1990; Danna & Griffin, 1999) and extensive research has focused on predicting factors such as core personality traits (e.g. Big Five; Judge et al., 2002) and job resources (Bakker & Demerouti, 2007; Gorter et al., 2006). A more recent line of research suggests that self-evaluative personality traits function as personal resources that affect well-being. Past research confirms the relevance of personal resources in explaining levels of well-being in working adults (e.g. Stumpp et al., 2010; Kafetsios & Zampetakis, 2008). Although much is known about relations between personal resources and well-being, little is known about whether personal resources also relate to dental professionals work well-being. Thus, the present study aims to examine associations between CSE and trait EI and dentists' work well-being (*Hyp-1 and Hyp-2*).

5.1.2. Intrinsic and extrinsic goal content

Second, while study two examined the motives (or reasons) for personal goal pursuit (self-concordance) among dental students, this study focused on a related but distinct motivational framework; the intrinsic and extrinsic goal content approach (cf. section 2.10.2 in literature review, and Kasser & Ryan, 1993, 1996). *Intrinsic goals* such as personal growth and

community involvement are distinguished within this goal content framework as those that are inherently rewarding as they satisfy psychological needs of autonomy, competence, and relatedness (Deci & Ryan, 2000b). By contrast, *extrinsic goals* are primarily characterised by having an ‘outward’ orientation, with one’s pursuits being directed towards external of worth such as wealth, fame and appealing image (Kasser & Ryan, 1993, 1996; Kasser, 2002). Past work that focused on people’s life goals/aspirations contents has found that life goals such as community, social affiliation, and self-acceptance can be grouped into intrinsic goals, whereas financial success, appearance, and popularity into extrinsic goals (Kasser & Ryan, 1996; Grouzet et al., 2005).

5.1.2.1. Relative intrinsic goals and their effects on (work) well-being

The pursuit of relative intrinsic life goals¹ has been positively associated with different well-being indicators including subjective well-being (Kasser, 2002, Vansteenkiste et al., 2008; Romero et al., 2011). Moreover, recent research within the work-domain has further demonstrated that valuing intrinsic over extrinsic goals is associated with adaptive outcomes such as greater job satisfaction, dedication, vitality, and less emotional exhaustion (Vansteenkiste et al., 2007; Van den Broeck et al., 2008). Yet, this has not been tested within the dental context. To close this gap and to extend previous findings by using a broader work well-being measure, it is hypothesised that relative intrinsic goals are positively (*Hyp-3*) associated with ratings of global work well-being.

¹SDT argues that intrinsic and extrinsic goals represent opposite poles on a single dimension. Thus, the relative emphasis on either can be conceptualised as a single scale, in the above case, relative intrinsic life goals (cf. section 2.10.2) in literature review.

5.1.2.2. Linking relative intrinsic goals to personal resources and work well-being

Third, since pursuit of intrinsic relative to extrinsic goals is linked to numerous positive consequences, it is of interest to detect why people adopt specifically intrinsic goals. Findings in goal regulation research point to the fact that trait related personal resources such as CSE and trait EI are related to the adoption of self-concordant personal goals (cf. sections 2.10.4.1 & 2.10.5 in literature review). Since intrinsic goal contents (cf. section 2.10.2) and self-concordant goal regulation (cf. section 2.10.3) are empirically distinguishable, yet positively correlated constructs ($r = 0.30$; Vansteenkiste, et al., 2008), it seems reasonable to predict that personal resources may relate in a similar meaningful way to relative intrinsic goals. This argument is further supported by the fact that several motivation theorists have conceptualised goals as motivational mechanisms which mediate the effects of personality traits on well-being (e.g. Elliot & Trash, 2002; Vallerand, 1997). As the effects of traits on outcomes are fully mediated by goal constructs in these models (e.g. Elliot & Trash, 2002), it seems plausible to argue that relative intrinsic goals fully mediate the effects of CSE/trait EI on work well-being. If results demonstrate that dentists' CSE and trait EI relate to relative intrinsic goal pursuit, it could help to shed light on the underlying process that links personal resources to work well-being.

5.2. The present study

This study was guided by three main objectives: First, to extend findings from study one and two by testing whether the two personal resources constructs (CSE/trait EI) are associated with dental practitioners work well-being. Second, to examine whether relative intrinsic goals

are related to dentists' positive ratings of work well-being in the same way as for dental students. Third, to test a mediational model that connects CSE/trait EI to work well-being through relative intrinsic goals. All study hypotheses are presented in more detail below.

5.2.1. Hypotheses

- (1) Core self-evaluations show positive relationships with positive affect, life satisfaction, job satisfaction, and global work well-being.
- (2) Trait Emotional intelligence show positive relationships with positive affect, life satisfaction, job satisfaction, and work well-being.
- (3) Relative intrinsic goals (importance/likelihood) would positively relate to global well-being.
- (4) Relative intrinsic goals² will mediate the relationship between core self-evaluations and global well-being.
- (5) Relative intrinsic goals will mediate the relationship between trait emotional intelligence and global well-being.

² As relative intrinsic scores are measured on importance and likelihood ratings (cf. section 2.10.2), it is important to specify that the relative importance and likelihood subscales of intrinsic goals are studied here.

5.3. Method

5.3.1 Procedure

A cross-sectional, self-report, survey was used. The aims of the sampling strategy were to assemble a sample that was as close to representative of English dentists as possible. A cluster sampling technique was based on random selection of 9 of the 152 Primary Care Trusts (PCTs) across England. Within each trust, all dentists working in private practice, NHS-General Dental Service (GDS), NHS-Personal Dental Service (PDS), salaried primary care services and access centres were identified and posted surveys.

Selection of the 9 PCTs was achieved using randomisation software. To guard against sampling error producing outlier PCTs, information on the population size and DMFT³ of 5-year-olds for the PCTs (based on locally co-ordinated epidemiological studies) were checked against figures for population size and DMFT distribution for all PCTs across England. The selected PCTs showed population size and DMFT profiles that are broadly consistent with the national profile.

Salaried dental services are directly provided by PCTs, but the nine PCTs produced few salaried staff. To increase this another 11 PCT's in addition to the 9 PCTs already selected were included for salaried staff only (thus totalling 20 PCTs). This procedure increased the representation of salaried dentists in the sample.

³ DMFT describe the amount (prevalence) of dental carries in an individual. DMFT are means to numerically express the caries prevalence in five year olds and are obtained by calculating the number of Decay (D), Missing (M), and Filled (F) teeth (T). The sum of the three figures forms the DMFT-values (cf. WHO, 2009). These provide an indication of population dental health.

Lists of general practitioners and salaried dentists were obtained by negotiation with the dental leads and clinical directors of each PCT. Based on names and addresses obtained from these lists, 1199 envelopes were prepared and posted to the identified dental practitioners between November 2009 to May 2010. Each envelope included the following materials: cover letter, participant information sheet, self-report questionnaire, and a pre-paid return envelope. Consent to participate was obtained through the return of a completed questionnaire. A coding system was used to enable reminders to be sent to non-responders. A maximum of two postal reminders were sent to non-responders (cf. Dillman, 1978). Each reminder envelope contained a reminder letter, a self-report questionnaire, and a pre-paid return envelope.

5.3.2. Participants

A total of 611 out of 1199 dentists participated by completing and returning the self-report questionnaire. The response rate was 51%. The sample consisted of 57% male and 43% female dentists. The mean age of the participants was 43.4 (SD = 10.98). Of the dentists, 48.9% were Principal (usually practice owner), 48.9% Associate (usually employed as a dentist in practice), and 2.2% vocational trainee (qualified dentists who are in training before full registration with the General Dental Council). The percentage of dentists working in different type of practices were as follow: 16.9% were working in the community dental service; 2.0% in prison service, 4.7% in access centre, 27.7% in NHS practice (only NHS patient), 44.9% in mixed practice (NHS/private practice), and 5.7% in private practice. The

practices were located in the following areas: 9.4% in rural area, 39.8% in suburban, 50.8% in urban area. Of these practises were 11.3% reported to be single handed.

5.3.3. Measures

Intrinsic-Extrinsic goal content: The Aspiration Index (AI: Kasser & Ryan, 1996) was used to measure intrinsic/extrinsic contents of dentist goals. The AI scale is a 30-item inventory that measures six different goal domains by asking respondents to indicate the importance and likelihood of their achieving listed goals. Three of these domains are conceptualised as representing 'intrinsic' goal contents (growth, community, relationship), and three representing 'extrinsic' goal contents (wealth, fame, image). Using a 5-point Likert scale ranging from 1 (not at all important) to 5 (very important), participants rated each of the 30 items according to (1) the importance they place on this goals, and (2) the likelihood to happen in future. Example items were: 'To be a very wealthy person' (wealth domain) and 'To help others improve their lives' (community domain). Cronbach alpha for the intrinsic/extrinsic scales were as follows: intrinsic importance $\alpha = 0.88$; extrinsic importance $\alpha = 0.92$; intrinsic likelihood $\alpha = 0.89$; extrinsic likelihood $\alpha = 0.90$. Appendix (A) lists all measures used in this study.

Core self-evaluations (CSE): Consistent with study two, CSE was measured, using the 12-item CSES scale (CSES: Judge et al., 2003). The scale measures 4 core personality traits (Self-Esteem; Locus of Control, General Self-Efficacy, and Neuroticism). All items were scored on a 5-point Likert-scale, ranging from 1 (not at all important) to 5 (very important). Example items were: 'I complete tasks successfully', and 'I am filled with doubts about my

competence'. The scale items were summed and accordingly reversed coded. The Cronbach alpha coefficient for CSES total score was $\alpha = 0.80$.

Trait Emotional Intelligence (Trait EI): Trait EI was measured, as in study one, with the 'Trait Emotional Intelligence Questionnaire-Short Form' (TEIQue-SF: Petrides & Furnham, 2006). The TEIQue-SF consist of 30-items responded to on a 7-point Likert-scale ranging from 1 (completely disagree) to 7 (completely agree). Example items were: 'Expressing my emotions with words is not a problem' and 'On the whole, I'm able to deal with stress'. The Cronbach alpha reliability for the Total trait EI scale was $\alpha = 0.86$.

Subjective Well-Being (SWB): Consistent with study one and two, SWB was measured with the Satisfaction with Life Scale (SWLS: Diener et al., 1985) and the Positive and Negative Affect Scale (PANAS: Watson et al., 1988).

The Satisfaction with Life Scale (SWLS: Diener et al., 1985) is a 5-item scale that taps into dentists' global, cognitive assessment of their life as a whole. Participants responded to on a 7-point Likert-scale ranging from 1 (strongly disagree) to 7 (strongly agree). Example items are: 'The conditions of my life are excellent'; 'I am satisfied with my life'. All five items were summed. The Cronbach alpha reliability for this scale was $\alpha = 0.89$.

Affective States were measured with the PANAS scale (Watson et al., 1988). The inventory consists of 10 positive (e.g.: happy, joyful, pleased) and 10 negative (e.g. depressed, frustrated, angry) emotion adjectives. Participants are typically asked to indicate the extent to which they experience these adjectives in general, responding to a 5-point Likert-scale ranging from 1 (very slightly/or not at all) to 5 (extremely). The scores of each factor were summed. Cronbach alpha reliabilities for the PA and NA scales were $\alpha = 0.86$ and $\alpha = 0.88$, respectively.

Work Well-Being

In addition to general well-being, work specific well-being was measured through the job in general scale (JIG: Ironson et al., 1989). The JIG represents a valid and reliable unidimensional scale that can be used as a measure of overall job satisfaction. The internal consistency of the JIG has been reported to range between $\alpha = 0.91 - 0.95$ (total N = 3,566, Ironson et al., 1989). The JIG scale shows convergent validity with other job satisfaction scales such as the Brayfield-Rothe scale (1951). The JIG scale consists of 18 short adjectives evaluation feelings of own job. Example items are: 'pleasant', 'poor', 'acceptable', 'bad'. Participants responded to these short items on a three-point response format ('Yes', 'No', and 'Undecided'). The scale items were summed and accordingly reversed coded. The Cronbach alpha coefficient for JIG scale was $\alpha = 0.88$.

5.3.3.1. Socio-demographics and practice specific variables

Demographic variables, age and gender, as well as practice specific information were obtained. Practice specific questions included (1) whether dentists were principals, associates or vocational trainee's (2) type of work place (Community dental service, prison service, access centre, NHS practice, NHS/private practice, or private practice), (3) socio-economic area of the practice (Rural, Suburban, Urban Area), (4) percentage of NHS/private mix, and (5) whether practice is single handed.

5.3.3.2. Ethical approval

Ethical approval for this study was reviewed and granted by the National Ethics Research Committee (NRES) as well as the research and development division (R&D) in each of the twenty PCT's (see Appendix-B for documentation and approval letters).

5.4. Results

5.4.1. Preliminary analysis

Prior to conducting main analysis concerning the research hypotheses, a preliminary analysis of the underlying factor structure of (a) a global work well-being Index comprising of positive affect, negative affect, life and job satisfaction (Page & Vella-Brodrick, 2009) and (b) the Aspiration Index (Kasser & Ryan, 1996) were carried out. This approach was considered as a critical pre-analytic step to establish whether (a) the four well-being measures form a composite factor that reflects a single work well-being index and, (b) whether dentists' life goals fall, as proposed by Kasser & Ryan (1996), into a two-factor solution of intrinsic and extrinsic goals.

To establish the factor structure of the global work well-being index, a principal component analysis (PCA) was performed using sub-scales and not individual items. Prior to performing the PCA, the factorability of the correlation matrix was checked by examining the Kaiser-Meyer-Okin (KMO) and Bartlett's Test of Sphericity (Bartlett, 1954) statistics. This was

followed by a principal component analysis. Results of the PCA are displayed in Table 5.1 & Table 5.2. As expected, all four measures loaded strongly on only one single factor (loadings above 0.70) with an eigenvalue exceeding 1 (2.27), explaining 57% of the variance. Thus, findings supported a global solution comprised of both, general (SWB) and context-specific (Job Satisfaction) well-being measures (e.g. Page & Vella-Brodrick, 2009). To be able to use this global work well-being measure in subsequent univariate/multivariate investigations, a single variable was created by first standardising the four scores (that is transforming the scores into Z-scores) and then subtracting negative affect from the sum of positive affect, life satisfaction, and job satisfaction measures (Diener, 1994; Sheldon et al., 2004)

TABLE 5.1

Eigenvalues, Percentage of Variance, and Cumulative Percentages for Factors of the 43-Item SWB-Composite

Factor	Eigenvalue	% of Variance	Cumulative %
1	2.268	56.691	56.691
2	.662	16.552	73.243

TABLE 5.2

Summary of Items and Factor Loading for One-Factor Solution for the SWB-Composite

Items	Factor Loading
PosAff	.756
NegAff	-.701
LS	.791
JobGeneral	.762

Note: Only factor loadings above |0.40| are presented.

PosAff: Positive Affect
NegAff: Negative Affect
LS: Life Satisfaction
JobGeneral: Job Satisfaction

Next, the two-factor structure of the Aspiration Index was examined. To this end, two principal component analyses (PCA) with Varimax rotation were performed, one for the importance and one for the likelihood subscale. Results for this are displayed in Tables 5.3-5.7. As can be seen, two factors with an eigenvalue higher than 1 could be retained in each PCA analysis, explaining 70% and 68% of the variance respectively. All six variables for the importance/likelihood scales loaded neatly on two factors with factor loadings above 0.70. Consistent with past research (e.g. Kasser & Ryan, 1996), the two higher-order factors could be interpreted as representing intrinsic and extrinsic life goals of dental practitioners.

SDT argues that intrinsic and extrinsic goals represent opposite poles on a single dimension. Thus, it is possible to compute a single score that refers to either relative intrinsic or extrinsic tendencies (Kasser & Ryan, 1996; Kasser, 2002). A mean-corrected score procedure was applied to generate this score. Following steps outlined in Schmuck et al. (2000, pp.229-32), the following procedure was used to calculate a relative intrinsic score. First, total importance and likelihood scores were calculated (that is, the overall importance/likelihood that dentists rated *all* life goal items, regardless of content) by averaging across all six life goal domains. Then, in a second step, the relative importance and likelihood dentists placed on each domain (or subscale) was computed by subtracting the total importance/likelihood score (obtained in step one) from each of the six subscale scores. This yielded six different mean-corrected importance and likelihood scores, one for each type of life goal. To obtain a summary *relative intrinsic score* for both importance and likelihood ratings, the three mean-corrected importance/likelihood scores were averaged. The two resulting variables, *relative intrinsic likelihood* and *relative intrinsic importance*, were then used in all subsequent analysis.

TABLE 5.3

Means of Intrinsic/Extrinsic Aspirations Without Mean Corrected Procedure

	Mean	Std. Deviation	Cronbach's Alpha
Intrinsic Likelihood	4.90	0.96	0.89
Extrinsic Likelihood	3.13	1.01	0.90
Intrinsic Importance	5.74	0.78	0.88
Extrinsic Importance	3.27	1.13	0.92

TABLE 5.4

Eigenvalues, Percentage of Variance, and Cumulative Percentages for Factors of the Aspiration Importance Index

Factor	Eigenvalue	% of Variance	Cumulative %
1	2.784	46.403	46.403
2	1.418	23.640	70.043
3	0.674	11.227	81.270

TABLE 5.5

Eigenvalues, Percentage of Variance, and Cumulative Percentages for Factors of the Aspiration Likelihood Index

Factor	Eigenvalue	% of Variance	Cumulative %
1	3.093	51.547	51.547
2	1.010	16.839	68.386
3	0.654	10.902	79.288

TABLE 5.6

Summary of Items and Factor Loadings for Varimax
Orthogonal Two-Factor solution for the Aspiration Importance
Index

Items	Factor Loading
Wealth	0.851
Fame	0.841
Image	0.836
Growth	0.828
Relationship	0.737
Community	0.833

Note: Only factor loadings above |.4| are presented.

TABLE (5.7)

Summary of Items and Factor Loadings for Varimax
Orthogonal Two-Factor solution for the Aspiration Likelihood
Index

Items	Factor Loading
Wealth	0.714
Fame	0.854
Image	0.798
Growth	0.782
Relationship	0.832
Community	0.707

Note: Only factor loadings above |.4| are presented.

Preliminary analyses

Given the heterogeneity in the socio-demographic characteristics of the sample and to avoid spurious correlations attributable to such factors, preliminary analysis were conducted to

identify relationships between study variables (traits, life goals, and well-being) and gender, age, practice location (urban, suburban, rural), and position in practice (principal, associate, or vocational trainee). One-way ANOVAs and correlation statistics were performed to check the significant of these relations. As findings indicated that socio-demographic factors had only marginal impact on main study variables, it was not necessary to control for their influence in subsequent univariate and multivariate analyses.

5.4.2. Correlational analysis

Following preliminary analysis, descriptive statistics and bivariate correlations were examined next. Table 5.8 shows results among all study variables.

5.4.2.1. Associations Between Personal resources and dental practitioner's work well-being

As can be seen from the correlation matrix in Table 5.8, hypotheses one and two (H-1, H-2) were both supported. Core self-evaluation was positively correlated with positive affect ($r = 0.53, p < 0.01$), life satisfaction ($r = 0.55, p < 0.01$), job satisfaction ($r = 0.41, p < 0.01$), and work well-being ($r = 0.69, p < 0.01$). This suggests that dentists with high CSE scores were not only more able to experience positive affect, but equally so, were more satisfied with their lives and jobs overall. The finding that CSE was inversely correlated with negative affect further underlines the detrimental effects of having low CSE scores on affective well-being.

Results concerning trait EI showed a similar significant trend. Trait EI was positively correlated with positive affect ($r = 0.57, p < 0.01$), life satisfaction ($r = 0.50, p < 0.01$), job satisfaction ($r = 0.36, p < 0.01$), work well-being ($r = 0.67, p < 0.01$), and inversely correlated with negative affect ($r = -0.60, p < 0.01$).

Taken together, results suggest that dentists with high trait EI and CSE showed greater well-being. The fact that the global well-being index was strongly correlated with both, trait EI and CSE, supports the positive link between personal resources and cognitive/affective aspects of work well-being.

TABLE 5.8
Means, Standard Deviations, Cronbach's Alpha, and Correlations of Main Study Variables

	Trait EI	CSE	Intrin Imp	Intrin Like	SWB Comp
Trait Emotional Intelligence	--				
Core Self-Evaluations	0.63**	--			
Relative Intrinsic Importance	0.13**	0.00	--		
Relative Intrinsic Likelihood	0.18**	0.05	0.70**	--	
SWB -Composite	0.67**	0.69**	0.05	0.12**	--
Mean	150.2	41.6	6.2	4.4	-
SD	20.9	6.5	2.9	2.4	-

Note:

SWB-Comp = Positive Affect, Life Satisfaction, Job Satisfaction, Negative Affect

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

5.4.2.2. Relative intrinsic goals and associations with well-being

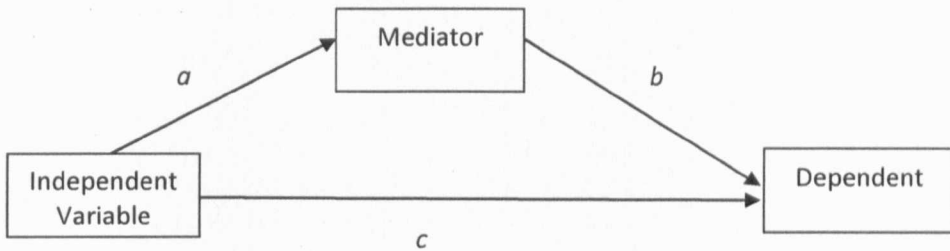
Contrary to expectations, attaching more importance to intrinsic than extrinsic goals was not associated with global well-being. Likelihood ratings of relative intrinsic goals showed a similar pattern, except for life satisfaction ($r = 0.14, p < 0.01$). Notably in this regard was the fact that perceived likelihood of attaining intrinsic goals of growth, relationship, and community was positively related to global work well-being ($r = 0.12, p < 0.01$). As life satisfaction was the only single measure that was correlated with intrinsic goals, it seems likely that the positive correlation with global work well-being can be largely attributable to this specific correlation.

5.4.3. Mediation analysis

5.4.3.1. Linking relative intrinsic goals to personal resources and work well-being

After establishing a direct effect of trait EI and CSE on global well-being, it was next examined whether this direct effect could be mediated by relative intrinsic goal content (H-4 and H-5). Following recent recommendations (Shrout & Bolger, 2002; Zhao et al., 2010), the only necessary requirement for mediation is to test whether the indirect pathways ($a \times b$) are significant. If the a and b paths are significant and c is not then full mediation should be concluded as a result. If mediated effect ($a \times b$) and direct effect (c) both exist (that means both are significant) and point at the same direction, then partial mediation should be concluded as a result (Zhao et al., 2010).

FIGURE 5.1 A statistical mediation model



To test for indirect effects ($a \times b$), a bootstrapping method was employed consistent with the analytical strategy used in study 2 (Preacher & Hayes, 2008). Prior to analysis, models were constructed based on correlations between the mediator (relative intrinsic goals, both likelihood/importance scales) and both, the independent and dependent variables. Since only the likelihood subscale of relative intrinsic goals appeared to correlate with trait EI and global work well-being, it was decided that only this model was further tested for potential mediational effects.

(1) Model

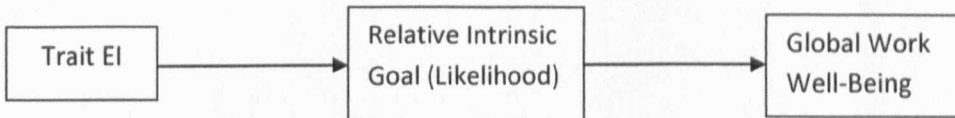


Figure 5.2 and Table 5.9 presents bootstrap estimates based on 5,000 bootstrap samples. An examination of the specific indirect effects in table 5.9 indicates that relative intrinsic goal (Likelihood) was not a mediating variable. Interpretation of the bootstrap data is accomplished by determining whether zero is contained within the 95% Confidence Intervals (CI). Since the 95% Confidence Interval contained zero, it was concluded that relative intrinsic likelihood goals were not mediating the relationship between trait EI and global work well-being. In other words, the relation between trait EI and global work well-being was not mediated by relative intrinsic goal likelihood.

TABLE 5.9

Simple Mediation of the Indirect Effects of Trait EI Through Changes in Intrinsic Likelihood Goals
(N = 561); 5000 Bootstrap Sample

Model	Independent variable	Mediating variable	Dependent variable	Point Estimate Indirect Effect (<i>a x b</i>)	BCa * 95% CI
					<i>Lower</i> <i>Upper</i>
(1)	Trait EI	Intrinsic - Lik	SWB-Comp	0.0038	-0.0465 0.0336

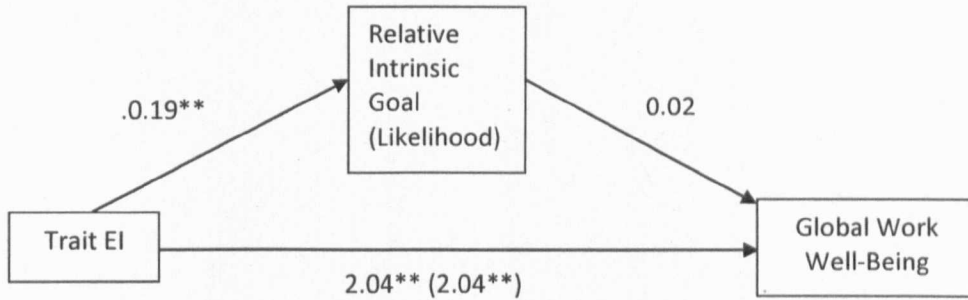
Note:

*BCa = bias corrected and accelerated bootstrapping confidence intervals that include corrections for both media bias and skew (Preacher & Hayes, 2008). Confidence intervals containing zero are interpreted as not significant.

Intrinsic-Lik = Intrinsic Likelihood Goal rating

SWB-Comp = Positive Affect, Negative Affect, Life Satisfaction, Job Satisfaction

FIGURE 5.2: A mediational model linking trait EI, relative intrinsic goals and global work well-being



Note: Path values represent standardised regression coefficients. The value in the parentheses represents the total effect of trait EI on SWB prior to the inclusion of the mediating variables. Value outside of the parentheses represents the direct effect, from bootstrapping analysis, of trait EI on global well-being after the mediator is included. * $p < 0.05$. ** $p < 0.01$. $N = 561$

5.5. Discussion

This study used a sample of dental practitioners to examine (1) the relationship between CSE/trait EI and work well-being, and (2) the link between relative intrinsic goals and work well-being, and (3) whether the direct effects of CSE/trait EI on work well-being are mediated through relative intrinsic goals. In general, findings did not provide evidence for a motivational pathway that connects CSE/trait EI with well-being. Findings revealed, however, that dentists' personal resources and goal contents influence cognitive and affective well-being measures to varying degrees.

5.5.1. Associations between CSE/trait EI on global work well-being

The present study found, in accordance with hypothesis one and two, empirical support for direct effects of core self-evaluations and trait emotional intelligence on dentists' subjective well-being as well as global work well-being. This is in line with past research on other populations that found such a possible link (Judge et al., 2003; Stumpp et al., 2010; Kafetsios & Zampetakis, 2008; Sy et al., 2006; Tsaousis et al., 2007; Gallagher et al., 2008). Results with regard to trait EI showed more specifically, that dentists who obtained high levels of trait EI also had significantly higher levels of a) job and life satisfaction and, b) positive affect. These results are consistent with previous research on the association between trait EI and (work) well-being (e.g. Gallagher & Villa-Brodrick, 2008; Kafetsios & Zampetakis, 2008). A similar positive result was found for core self-evaluations. That is, dentists who

scored high on the core self-evaluations were more likely to experience their lives and jobs as more satisfying. Most conducted research with dentists' samples have focused on contextual factors (e.g. job resources) to explain differential degrees of job engagement and satisfaction (cf. Harris et al., 2009a; Harris et al. 2009b, and, section 2.12). The present findings extend this body of research by showing the significant influence of personal resources on dentists' work well-being. This, together with results from other work domains studies (cf. Xanthopoulou et al., 2007), suggest that personal resources can play an important role for enhancing dentists well-being.

5.5.2. Relative intrinsic goals and dentists (work) well-being

Relative intrinsic goals have been shown in past research to contribute to individual level of well-being in different adult samples (e.g. Schmuck & Sheldon, 2001). Accordingly, it was expected that higher importance ratings of relative intrinsic goals influence would be associated with dentists' work well-being. Contrary to this expectation, findings could not support such claims. That is, placing greater importance on relative intrinsic goals was neither significantly associated with general (PA, NA, LS) nor with work specific well-being (JS). A similar non significant pattern was obtained for the likelihood subscale of relative intrinsic goals. Noteworthy in this regard is the finding that life satisfaction and global work well-being were both significantly, but weakly, correlated with the likelihood subscale of relative intrinsic goal.

Overall, results with regard to intrinsic goal content hypothesis did not hold up with expectations. This is a very surprising finding as this line of research is well supported by

empirical and theoretical work (Kasser & Ryan, 1996; Ryan et al., 1999; Schmuck & Sheldon, 2001; cf. Kasser, 2002). Furthermore, there was little evidence for methodological problems. The data set contained a reasonably large sample size and measures were also psychometrically sound. Consequently, it seems safe to suggest that methodological aspects can be ruled out in explaining the poor performance of the goal content measure. However, to be absolute certain about this conclusion, row mean scores of intrinsic/extrinsic importance and likelihood (cf. Table 6.0) were further compared to means of other published populations (Schmuck et al., 2000; Kasser & Ryan, 1996; Ryan et al., 1999; Romero et al., 2011). Comparison of these means did not reveal any major dissimilarity to suggest that dentists behaved differently compared to the other samples.

TABLE 6.0

Comparison of Means of Intrinsic/Extrinsic Aspirations across Published Populations

	Current Sample	Schmuck et al. (2000)	Romero et al. (2011)	Kasser & Ryan (1996)		Ryan et al. (1999)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)		Mean
				Male	Female	
Likelihood						
Intrinsic	4.9 (0.96)	4.1 (0.54)	5.4 (0.78)	3.9 (0.48)	4.1 (0.50)	4.1
Extrinsic	3.1 (1.01)	3.2 (0.60)	3.2 (0.91)	3.3 (0.65)	3.1 (0.55)	3.0
Importance						
Intrinsic	5.7 (0.78)	4.6 (0.36)	6.3 (0.54)	4.3(0.44)	4.6 (0.43)	4.4
Extrinsic	3.3 (1.13)	3.2 (0.83)	3.6 (1.02)	3.4 (0.75)	3.1 (0.71)	3.0

SD = Standard Deviation

Since methodological and sample specific reason could be excluded, it is worth to recall that some authors critiqued SDT's goal content approach (Carver & Scheier, 1998; Srivastava et al., 2001). For example, Carver and Baird (1998) and Srivastava and colleagues (2001) argued in this context, that it is not the goal content that influences well-being, but more importantly the motive or the 'why' behind goals. What this line of research thus suggests is that 'any goal or value may lead to well-being, to the extent that it is self-concordant' (Sagiv et al., 2004, p.74). As self-concordant motives were not directly measured in this study, it seems worth it to explore in future studies whether motive congruency influences dentists work well-being. For the moment, however, it can be concluded that relative intrinsic goal measures do not matter much for dentists' work well-being.

5.5.2.1. Linking relative intrinsic goals to personal resources and work well-being

A third aim of the present study was to further explore the mechanism behind the direct effects of CSE/trait EI on dentists (work) well-being. This research question has generally received less attention in the literature. Yet it is relevant to know the underlying process that connects personal resources to work well-being. To address this question, a motivational approach was tested in which relative intrinsic life goals were hypothesised to mediate the relationship between CSE/trait EI and work well-being. Contrary to expectations, results showed that relative intrinsic goals did not mediate the relationship between trait EI and global well-being. However, a noteworthy finding from the model was that high trait EI was positively related to measures of perceived likelihood to attain intrinsic goals. This is an interesting finding as it corresponds to research that shows a meaningful relation between trait EI and motivational constructs (Spence et al., 2004; Christie et al., 2007).

For example, Christie and colleagues found evidence for a relation between trait EI and the need for achievement motivation⁴. The findings here add another piece of evidence to the motivational line of research by showing that high trait EI influences whether individuals expect to attain relative intrinsic goals in the future.

In conclusion, the findings provide evidence of a significant relation between personal resources rooted in cognitive and emotional self-evaluation and (work) well-being among dentists. Second, the hypothesis that relative intrinsic goals potentially mediate the relationship between CSE/trait EI and global work well-being was not supported by the data.

Third, despite the non significant mediational results, findings did show that trait EI hold an important function for competence/optimism expectations to attain relative intrinsic goals in the future.

⁴ McClelland et al. (1958, p.181) defined the need for Achievement (nAchievement) as 'success in competition with some standard of excellence'. A high level of this motivation has been associated with the tendency to take moderate risks, to set specific goals, and to persist at achievement task'.

6. General Discussion

6.1. Introduction

The main thesis research questions were:

- 1) To investigate whether core self-evaluations (CSE) and trait emotional intelligence (trait EI) predict variance in dental students and dental practitioners subjective and global work well-being.
- 2) To investigate whether hypothesised links between CSE/trait EI and well-being measures can be explained by two motivational frameworks rooted in self-determination theory (SDT).

These research questions were put forward following an analysis of previous literature concerning CSE and trait EI, which indicates that the above constructs are useful in predicting health and work outcomes (Van Rooy & Viswesvaran, 2004; Schutte et al., 2007; Martins et al., 2010; O'Boyle et al., 2010). Trait EI and CSE have never been used to predict components of well-being outcomes in a dental context and so the exploration of these concepts in this setting is new. To investigate the potential associations between these constructs on dental students and practitioners' well-being, three empirical studies were conducted.

This chapter presents a summary of the main findings, which is followed by a discussion on theoretical and practical implications as well as study limitations. Some opportunities for further work in this area will also be considered.

6.2. Summary of main findings

Based on the findings of the three studies included in the thesis, it is possible to tentatively provide empirically-based answers to these two questions. To sum up; across all three studies, there is evidence for the predictive validity of CSE and trait EI variables on general and work specific well-being levels of dental students and practitioners. Study one showed the capacity of both personal resource constructs to explain variance in subjective well-being components beyond that accounted for by the big five traits.

Findings, however, did not support the idea that the use of intrinsic goals mediates this. That is, data in study two could not provide evidence for the claim that the effects of CSE and trait EI on subjective well-being can be explained through dental students' intrinsic reasons for pursuing their personal goals. Again, findings in study three did not provide evidence for the hypothesis that relative intrinsic goal content mediates the relation between dentists' CSE/trait EI and work well-being.

The overall implications are that personal resources such as CSE and trait EI might play a role for dental students' and dental practitioners' subjective and global work well-being. Specifically, the finding that CSE and trait EI can explain variance beyond traditional core

personality traits is an important contribution because it takes important potential confounding effects into account.

The non-significant findings concerning mediating effects are unfortunate because the development of interventions to improve well-being is dependent on being able to understand the reasons behind CSE and trait EI's direct effect. The empirical studies here contribute to this under-studied field of research by providing results relating to a testing of meditational effects of two personal resource-motivation models on (work)-well-being of dental students and practitioners. These kinds of models have never been empirically tested in dental or medical research, and although the findings do not show significant relationships, they can provide direction for future researchers exploring possible mediating mechanisms.

6.3. Limitations

Several methodological limitations of the three studies need to be acknowledged. First, data collection in all three studies was based on self-report measures. Self-report methods are commonly argued, specifically in personality research, to suffer from method bias when different constructs are assessed with the same method leading to correlations that are attributable to the use of the method. This can result in inflated correlations among the studied variables (Podsakoff et al., 2003). Another concern with using self-report methods is that participants might report lower than accurate levels of deviant behaviour and respond positively to a more socially desirable items. Some have therefore argued for the use of measures to control for these effects (e.g. social desirability scale, Stoeber, 2001) and for

additional rated measures from other sources such as spouse/partner or clinical trainer/supervisor (Paulhus & Vazire, 2007; Spector, 2006).

However, although such methods might improve the validity of results this requirement has also to be balanced against the feasibility of data collection using long and complicated questionnaires in this setting. Study three in particular is one of the very few types of study to be undertaken in a dental/medical practice. Time for completion of a questionnaire effectively cost practitioners money given the prevailing financial structures in UK practices. No payment or reimbursement of participants was made. Although initial versions of the protocol suggested some incentives for participants, the ethics committee view was that this represented inducement and should be removed from the protocol.

Second, the cross-sectional nature of the three study designs does not allow any conclusions concerning direction of causality. Causality in cross-sectional research can be only speculated and tentatively accepted (Bozionelos, 2003). To substantiate any claims, research designs with experimental or longitudinal character are needed (cf. Breakwell et al., 2006). Experimental designs demonstrate causality, whilst well-executed prospective studies eliminate reverse causality.

Third, although the response rate in the dental practitioner study (study three; 51%) was comparably high (51%) to another UK wide dentist health study (55%; Kay & Lowe, 2008), it was however, lower than reported in other UK studies among dentists (70.8%, Denton, et al., 2008; 79.5%, Harris et al., 2009a). However, known effective strategies to increase responses in postal questionnaire were implemented prior data collection such as: a) the use of colored ink in self-report questionnaire and cover letter, (b) personalized letter (cf. Appendix B); (c) inclusion of a pre-paid return envelope, and (d) providing non-respondents with questionnaire and altered cover letter (cf. systematic review by Edwards et al., 2008).

Despite these procedures, non-response has reduced the effective sample size and may have introduced bias in an unknown direction.

6.4. Theoretical implications

The findings of this thesis have theoretical implications for dental research in four specific ways. *Firstly*, it may be recalled that upon starting the investigation, there was a lack of clarity about how CSE and trait EI might influence SWB, and the explanatory framework in which they should be integrated. A greater clarity was subsequently achieved a) by taking a personal resources approach using the surface traits of CSE and trait EI as presenting personal resources that are of relevance to dentists' subjective well-being and, b) by integrating these two into a motivational framework that had the potential to explain influence on well-being measures.

Second, although a variety of other studies have examined the predictive validity of trait EI in dental research, the study here was the first to assess the incremental validity of both, self-report CSE and trait EI measures controlling core personality traits, in a dental education context. This point is not trivial if one considers the ongoing debate in the psychological literature concerning whether CSE and trait EI actually measure a novel construct in personality research (e.g. Schmitt, 2004; Conte, 2005). The former point becomes particularly evident in the emotional intelligence research field (as discussed in section 2.9) where it is not clear whether trait EI is a useful concept beyond the big five traits (or rather a form of ability/intelligence).

Third, subjective well-being is a well grounded theoretical construct that has been shown to buffer stress and contribute to health and work outcomes (e.g. Polk et al., 2005; Steptoe & Wardle, 2005). Yet, little attention has been given to SWB research in dentistry. Studies with regard to dental practitioners have predominately focused more on work-related factors that influence dentists' engagement and satisfaction with their job (e.g. Denton et al., 2008; Harris et al., 2009b). Recent advancement in work psychology recognizes, however, that peoples' work well-being depends not only on job resources (e.g. autonomy), but equally so, on personal resources linked to ability and personal control beliefs (e.g. Xanthopoulou et al., 2009).

In line with this new perspective, the present thesis presents evidence for associations between cognitive and evaluative self-evaluations and dentists' work well-being. These findings are in line with reported results in work psychology where single (e.g. self-esteem, self-efficacy, internal locus of control) as well as broader surface trait constructs (e.g. CSE, trait EI) of esteem and control beliefs have been shown to be associated with work criterion such as satisfaction, well-being, and performance (Brockner, 1988; Gardner & Pierce, 2009a; Judge & Bono, 2001; Ng et al., 2006; Van Rooy & Viswesvaran, 2004; Xanthopoulou et al., 2007, 2009; O'Boyle et al., 2010). The findings presented here, together with more recent ones about a reciprocal relationship between personal resources and job related resources, opens up the possibility that dentists work well-being can be studied within a model that combines personal and situational factors either as independent or combined influences that determine work and general well-being (cf. Hakanen et al., 2005; Xanthopoulou et al., 2007; Bakker & Leiter, 2010).

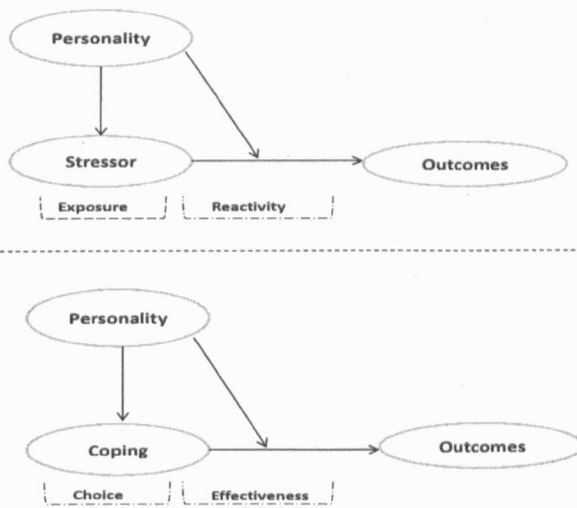
Fourth, personal resources such as CSE and trait EI account for significant variance in well-being measures. Yet, it is not fully clear how CSE and trait EI may influence these outcomes. This knowledge is needed for theory development and future intervention possibilities (e.g. Ferris et al., 2011; Petrides, 2011). Given that CSE and trait EI theorists have posited that the effects of CSE and trait EI on well-being are likely to be transmitted through trait EI/CSE impact on motivational mechanisms such as goals (Spence et al., 2004; Judge et al., 2005; Ferris et al., 2011), it was reasonable to test such assumptions in the present context. Although results showed some significant relations among the independent, mediator, and dependent variables, the analysis did not support a motivational pathway. Reasons for this are discussed in the discussion of the individual studies. Methodological problems in goal measurement were detected in study two (low inter-correlation of the four personal goals) but we did not find any evidence of measurement problems in study three. Two SDT theories were used with two types of goal measures (idiosyncratic or self-generated personal goals; nomothetic or pre-defined life goals), which suggests that goal processes may not mediate links between CSE/trait EI and SWB. Thus, it is worth coming back to possible alternative explanatory models that emphasise other mediators.

6.5. Coping as a potential mediator

A possible alternative mediational mechanism is the *appraisal/coping mechanism* (see Figure 6.1). Coping theory suggests that people differ in how they appraise and respond to stressful situations (Lazarus & Folkman, 1984). This is partly due to dispositional influences (Bolger & Zuckerman, 1995; Suls & David, 1996; Hobfoll, 2002). Figure 6.1 illustrates two

theoretical models on how personality influences appraisal and coping processes. In the first, personality factors affect appraisal of the stressor. In the second, the affect appraisal and implementation of the coping response.

FIGURE 6.1: Personality-appraisal/coping model



Adapted from Bolger & Zuckerman (1995, p.891)

Adapting such a framework to CSE/trait EI research suggest that inherent characteristics of both personality constructs influence individuals' appraisal and coping processes in two specific ways. First, CSE and trait EI are argued to enable individuals to view their environment more as a challenge than a threat (and consequently less stressful) and, secondly, to adopt a pro-active coping response when encountering a stressful situation. Empirical findings, including laboratory based ones, suggest that higher trait EI and CSE are positively associated with a) more challenging appraisals and lower threat appraisals and b) employment of more active coping strategies (e.g. problem-solving strategies) than passive

forms (e.g. avoidance strategies) (Petrides et al., 2007b; Mikolajczak et al., 2008; Mikolajczak & Luminet, 2008; Mikolajczak et al., 2006; Kammeyer-Mueller et al., 2009; Best et al., 2005). Studies in dentistry further confirm this. For example, Pau et al. (2003, 2007) showed that trait EI influenced whether dental students perceived their dental school environment as stressful or not.

Taken together, the appraisal/coping pathway suggests that CSE/trait EI influence both the stress perception and coping process. Furthermore, as high stress levels are known to affect negatively the quality of life of dentists (e.g. Humphris, 1998) and dental students (e.g. Gorter et al., 2008), it seems plausible that CSE/trait EI may influence well-being, at least to some degree. It would therefore be interesting to empirically test whether the coping/appraisal pathway represent a potential way of explaining how each construct (CSE and trait EI) exerts its influence on dentists' well-being measures. Research designs with mediational character would help to provide insights into direction and strength of these relations.

6.6. Implications for the mental health of dentists and dental students

The results of the empirical studies also have practical implications for dentistry. Particularly the positive relationship between personal resources and dentists' (and students) subjective and work well-being opens up the possibility that cultivating personal resources in this population may improve well-being. Given that personal resources are considered by some to be malleable and susceptible to environmental influences (Asendorpf & Van Aken, 2003;

Marsh et al., 2006), it could be worth focusing on evidence-based well-being training programs which strengthen these positive resource belief systems.

Given that positive mental health is personally and professionally of importance not least because of the need to retain expensively-trained and much needed dental professionals (Harris et al., 2009a, 2009b), it is sensible to consider interventions that potentially enhance personal resources. As the work-related attitudes and self-perceptions of dental students and early-career dentists are in the process of being formed, it makes sense to target specifically this group (Broomfield et al., 1996; Humphris, 1999). To improve generally the quality of such interventions, it is useful to have a systematic framework in place that assist in developing clear and reproducible training objectives (e.g. Bartholomew et al., 2001). Examples of this would include the development of self-image through the accomplishment of tasks based on a graduated level of difficulty, sensitively-delivered feedback and access to appropriate role-models and mentors. A structured, theoretically-driven and closely evaluated training process would benefit dental students and dentists, because it ensures that interventions are effective and sustainable (Kok et al., 2004).

6.7. Potential interventions of CSE and trait EI

Example interventions with respect to trait EI show that systematic training can enhance EI in populations including general and medical students as well as working adults (Fletcher et al., 2009; Slaski & Cartwright, 2003; Nelis et al., 2009). For example, a quasi-randomised study (Fletcher et al., 2009) among third year medical students from a UK university (N = 34, intervention group; N = 36, control group) showed that emotional intelligence training (seven

session plus four hours workshop) led to an increase in trait EI (measured with the EQ-I, Bar-On, 1997) over a seven months period compared to a control group with no training. Furthermore, Nelis et al. (2009) showed that psychology students who undertook an emotional intelligence training (four sessions of two and half hours, N = 19) over a four-weeks period had improved significantly trait EI scores (measured with the TEIQue, Petrides, 2009) compared to a matched control group without training (N = 18). Importantly, when the intervention group was followed up after six months, positive changes remained significant compared to the control group that did not improve over time (Nelis et al., 2009). Additional support for training improvement of EI was found in a repeated measure design study among 120 UK retail managers over a six month follow up period (Slaski & Cartwright, 2003).

Published intervention studies which explicitly target changes in core self-evaluations are commonly found in the health behavior literature where evidence is particularly strong concerning global self-esteem and general self-efficacy interventions. Several meta-analyses have reported on the effectiveness of such interventions (Hyde et al., 2008; Ashford et al., 2010; Hanley & Durlak, 1998). Most studies with regard to self-efficacy have based their interventions on strategies described by Bandura (1977, pp. 195-200) such as: *mastery experiences* (that is, to perform successfully targeted behavior for example through goal /setting planning); *vicarious experience* (seeing a 'similar other' successfully perform the behavior); *verbal persuasions* (others persuading the individual that he/she has the capability to master situation); *emotional arousal* (reducing negative emotional states such as stress and anxiety). For example, Bresio and colleagues (2011) showed that a cognitive behavioral intervention to reduce anxiety in a general student sample group significantly increased self-efficacy, academic engagement, and performance (in exams) measures compared to two control groups at six months follow up. Several studies in the work context have further identified that targeted training interventions (e.g. goal setting, behavioral modeling

intervention) increase self-efficacy beliefs among management trainees (Gist, 1989) and newly employed entry-level accountants (Saks, 1995).

Strategies in intervention studies to increase global self-esteem have predominately focused on three determinants of global self-esteem: (1) environmental structure to which one is exposed (e.g. complex job design, non-routine technologies, flexible organizational structures lead to higher self-esteem); (2) social messages received from significant others in one's social environment (e.g. if others believe and communicate that an individual is able and competent then over time individuals will come to hold similar self-beliefs; and (3) the individual's feelings of efficacy and competence derived from his/her direct and personal experience (e.g. successful completion of a project) (Pierce & Gardner, 2004; cf. Baumeister, 1999; Harter, 1999). For example, Lin et al. (Lin et al., 2004) tested in a longitudinal study the effects of an assertiveness training program on nursing and medical students' global self-esteem. Overall, findings revealed that self-esteem improved significantly in the training group compared to the control group at follow up.

Taken together, personal resources can be developed and may become more distinct. However, carefully planned and evaluated studies are needed to see whether findings are effective, especially given that change may be short lived (Judge & Hurst, 2007; Matthews et al., 2004).

6.8. Future research

Many questions remain unanswered in this area of inquiry, partly due to the relative novelty of trait EI, CSE and goal constructs, and to methodological and theoretical complexities associated with these study variables. Before research in dentistry can legitimately explore the practical applications of this line, further refinements are necessary. More work is needed to clarify conceptual and psychometric discrimination between single and multiple constructs related to CSE and trait EI measures. Future research needs also to focus on alternative mediators. Integrating CSE and trait EI within a coping/appraisal framework appears promising for application in a dental population. Such mediating studies should ideally have a prospective design to eliminate the risk of reverse causality, and control for effects of social desirability. Once the underlying mechanisms of CSE and trait EI effects are better understood, then intervention studies can be developed and tested for dentists and dental students.

6.9. Conclusion

This thesis set out to investigate the capacity of two recently developed self-evaluative personal resources, CSE and trait EI, to predict subjective and work well-being in dental students and dental practitioners. Past research has successfully linked CSE and trait EI with self-regulatory functioning and well-being in the health and organizational literature. However, no research in dentistry has studied subjective (work) well-being from a personal resources perspective.

A second and related aim has been to understand whether co-variation between personal resources and subjective well-being can be explained through self-regulatory processes related to intrinsic forms of goals that dentists and dental students set and attempt to pursue. This question has been generally under-studied. Three empirical studies were conducted to test the two stated research hypotheses.

Overall, findings did show that CSE and trait EI can predict variance in dental students' subjective well-being beyond that accounted for by the big five personality traits. However, findings could not support any motivational mediation. That is, intrinsic forms of personal and life goals of dentists and dental students could not explain the exerted effects of CSE and trait EI on subjective and work well-being. The findings across all three studies are novel in the field of dental research.

The overall implications are that personal resources such as CSE and trait EI might play a role for dental students' and dental practitioners' subjective and global work well-being. Given that positive mental health is personally and professionally of great relevance, it is sensible to consider evidence-based interventions to strengthen personal resources. As dental students and newly qualified dentists are exposed to situations where personal resources are in great need, it makes sense to tailor intervention around this population. Although much work remains to be done, developing positive core self-evaluations and trait emotional intelligence might prove beneficial to dental students' and practitioners' personal and work well-being.

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APPENDIX A

- Trait Emotional Intelligence Scale (Petrides & Furnham, 2006)
- Schutte Emotional Intelligence Scale (Schutte et al., 1998)
- Core Self-Evaluations Scale (Judge et al., 2003)
- Person project (Little, 1993)
- Self-Concordance Scale (Sheldon & Elliot, 1998)
- Big-Five Personality Scale (TIPI; Gosling et al., 2003)
- Individual Core Self-Evaluations Traits (Judge et al., 1998)
 - Rosenberg Self-Esteem Scale
 - General Self-Efficacy
 - Locus of Control
 - Neuroticism
- Aspiration Index (Kasser & Ryan, 1996)
- Satisfaction with Life Scale (Diener et al., 1985)
- PANAS (Watson et al., 1988)
- Job in General Scale (JIG; Ironson et al., 1989)

Trait Emotional Intelligence (TEIQue-SF; Petrides & Furnham, 2006)

Instructions: Please answer each statement below by putting a circle around the number that best reflects your degree of agreement or disagreement with that statement. Do not think too long about the exact meaning of the statements. Work quickly and try to answer as accurately as possible. There are no right or wrong answers. There are seven possible responses to each statement ranging from 'Completely Disagree' (number 1) to 'Completely Agree' (number 7).

- Expressing my emotions with words is not a problem for me.
- I often find it difficult to see things from another person's viewpoint.
- On the whole, I'm a highly motivated person.
- I usually find it difficult to regulate my emotions.
- I generally don't find life enjoyable.
- I can deal effectively with people.
- I tend to change my mind frequently.
- Many times, I can't figure out what emotion I'm feeling.
- I feel that I have a number of good qualities.
- I often find it difficult to stand up for my rights.
- I'm usually able to influence the way other people feel.
- On the whole, I have a gloomy perspective on most things.
- Those close to me often complain that I don't treat them right.
- I often find it difficult to adjust my life according to the circumstances.
- On the whole, I'm able to deal with stress.
- I often find it difficult to show my affection to those close to me.
- I'm normally able to "get into someone's shoes" and experience their emotions.
- I normally find it difficult to keep myself motivated.
- I'm usually able to find ways to control my emotions when I want to.
- On the whole, I'm pleased with my life.
- I would describe myself as a good negotiator.
- I tend to get involved in things I later wish I could get out of.
- I often pause and think about my feelings.
- I believe I'm full of personal strengths.
- I tend to "back down" even if I know I'm right.
- I don't seem to have any power at all over other people's feelings.
- I generally believe that things will work out fine in my life.
- I find it difficult to bond well even with those close to me.
- Generally, I'm able to adapt to new environments.
- Others admire me for being relaxed.

Schutte Emotional Intelligence Scale (SEIS; Schutte et al., 1998)

Instruction: In the space provided next to each of the following statements, please write in the number which best describes your agreement with the item, using the scale immediately below.

- I know when to speak about my personal problems to others.
- When I am faced with obstacles, I remember times I faced similar obstacles and overcame them.
- I expect that I will do well on most things I try.
- Other people find it easy to confide in me.
- I find it hard to understand the non-verbal messages of other people.
- Some of the major events of my life have led me to re-evaluate what is important and not important.
- When my mood changes, I see new possibilities.
- Emotions are one of the things that make my life worth living.
- I am aware of my emotions as I experience them.
- I expect good things to happen.
- I like to share my emotions with others.
- When I experience a positive emotion, I know how to make it last
- I arrange events others enjoy.
- I seek out activities that make me happy.
- I am aware of the non-verbal messages I send to others.
- I present myself in a way that makes a good impression on others.
- When I am in a positive mood, solving problems is easy for me.
- By looking at their facial expressions, I recognize the emotions people are experiencing.
- I know why my emotions change
- When I am in a positive mood, I am able to come up with new ideas.
- I have control over my emotions.
- I easily recognize my emotions as I experience them.
- I motivate myself by imagining a good outcome to tasks I take on
- I compliment others when they have done something well.
- I am aware of the non-verbal messages other people send.
- When another person tells me about an important event in his or her life, I almost feel as though I have experienced this event myself.
- When I feel a change in emotions, I tend to come up with new ideas
- When I am faced with a challenge, I give up because I believe I will fail.
- I know what other people are feeling just by looking at them.
- I help other people feel better when they are down.
- I use good moods to help myself keep trying in the face of obstacles.
- I can tell how people are feeling by listening to the tone of their voice.
- It is difficult for me to understand why people feel the way they do.

Core Self-Evaluation Scale (CSES, Judge et al., 2003)

Instructions: *Following are several statements about you with which you may agree or disagree. Using the response scale provided, indicate your agreement or disagreement with each item by placing the appropriate number on the line preceding that item.*

- I am confident I get the success I deserve in life.
- Sometimes I feel depressed.
- When I try, I generally succeed.
- Sometimes when I fail I feel worthless.
- I complete tasks successfully.
- Sometimes, I do not feel in control of my work.
- Overall, I am satisfied with myself.
- I am filled with doubts about my competence.
- I determine what will happen in my life.
- I do not feel in control of my success in my career.
- I am capable of coping with most of my problem.
- There are times when things look pretty bleak and hopeless to me.

Personal Goals (Personal projects; Little, 1993)

Personal projects can be thought as “goals and concerns that people think about, plan for, carry out, and sometimes (though not always) complete or succeed at.

Please state below 4 relevant short-term goals (2 Work + 2 Life) which you want to pursue in the next two months.

Please write down 4 personal short-term goals that would last at least through the next two months.

1) Work Goal: _____

2) Work Goal: _____

3) Life Goal: _____

4) Life Goal: _____

Self-Concordance Scale (Sheldon & Elliot, 1998)

*Please circle now **WHY** you want to pursue the goals (1-4) on the following scale.*

- because somebody else wants you to or thinks you ought to, or because you will get something from somebody if you do. That is, you probably would not strive for this if you did not get some kind of reward, praise, or approval for it.

- because you would feel ashamed, guilty, or anxious if you did not. Rather than striving just because someone else thinks you ought to, you feel that you ought to strive for that something.

- because you really believe that it is an important goal to have. Although this goal may once have been taught to you by others, now you endorse it freely and value it wholeheartedly.

- because of the fun and enjoyment which the goal provides you. While there may be many good reasons for the goal, the primary reason is simply your interest in the experience itself.

TIPI (Gosling, Rentfrow, & Swann, 2003)

Instructions: Here are a number of personality traits that may or may not apply to you. Please circle the appropriate number next to each statement to indicate the extent to which you *agree* or *disagree* with that statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other.

I see myself as:

- Extraverted, enthusiastic.
- Critical, quarrelsome.
- Dependable, self-disciplined.
- Anxious, easily upset.
- Open to new experiences, complex.
- Reserved, quiet.
- Sympathetic, warm.
- Disorganised, careless.
- Calm, emotionally stable.
- Conventional, uncreative.

Individual Core Self-Evaluations Traits (from Judge et al., 1998)

Instructions: Below are several statements about you with which you may agree or disagree. Using the response scale below, indicate your agreement or disagreement with each item by circling the appropriate number on the line preceding that item.

Rosenberg (1965) Self-Esteem Scale

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

Generalized Self-Efficacy (Judge, Locke, Durham, & Kluger, 1998)

- I am strong enough to overcome life's struggles.
- At root, I am a weak person.
- I can handle the situations that life brings.
- I usually feel that I am an unsuccessful person.
- I often feel that there is nothing that I can do well.
- I feel competent to deal effectively with the real world.
- I often feel like a failure.
- I usually feel I can handle the typical problems that come up in life.

Locus of Control (from Levenson, 1981)

- Whether or not I get to be a leader depends mostly on my ability.
- When I make plans, I am almost certain to make them work.
- When I get what I want, it's usually because I'm lucky.
- I have often found that what is going to happen will happen.
- I can pretty much determine what will happen in my life.
- I am usually able to protect my personal interests.
- When I get what I want, it's usually because I worked hard for it.
- My life is determined by my own actions.

Neuroticism (Eysenck & Eysenck, 1968)

- My feelings are easily hurt.
- I'm a nervous person.
- I'm a worrier
- I am often tense or "high strung."
- I often suffer from "nerves."
- I am often troubled by feelings of guilt.
- My mood often goes up and down.
- Sometimes I feel miserable for no reason.
- I am an irritable person.
- I often feel fed up.
- I often worry too long after an embarrassing experience.
- I often feel lonely.

Life Goals (Aspiration Index; Kasser & Ryan, 1996)

Instructions: Everyone has long-term goals or aspirations. These are things that individuals hope to accomplish over the course of their lives. In this section, you will find a number of life goals, presented one at a time, and we ask you two questions about each goal. (a) How important is this goal to you? (b) How likely is it that you will attain this goal in your life?

- To be a very wealthy person.
- To have my name known by many people.
- To have my name known by many people.
- To have good friends that I can count on.
- To successfully hide the signs of aging.
- To work for the betterment of society.
- To have many expensive possessions.
- At the end of my life, to be able to look back on my life as meaningful and complete.
- To be admired by many people.
- To be rich.
- To have my name appear frequently in the media.
- To achieve the "look" I've been after.
- To have enough money to buy everything I want.
- To be admired by lots of different people.
- To have an image that others find appealing.
- To share my life with someone I love.
- To have people comment often about how attractive I look.
- To assist people who need it, asking nothing in return.
- To be financially successful.
- To choose what I do, instead of being pushed along by life.
- To be famous.
- To have committed, intimate relationships.
- To keep up with fashions in hair and clothing.
- To work to make the world a better place.
- To know and accept who I really am.
- To feel that there are people who really love me, and whom I love.
- To help others improve their lives.
- To gain increasing insight into why I do the things I do.
- To have deep enduring relationships.
- To help people in need.

Satisfaction with Life Scale (SWLS; Diener et al., 1985)

Instructions: Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by putting a *circle* around the number preceding that item. Please be open and honest in your responding.

- In most ways my life is close to my ideal.
- The conditions of my life are excellent.
- I am satisfied with my life.
- So far I have gotten the important things I want in life.
- If I could live my life over, I would change almost nothing.

PANAS (Watson et al., 1988)

Instructions: This scale consists of a number of words that describe different feelings and emotions. Read each item and then circle the appropriate number in the space next to that word. Indicate to what extent you generally feel this way, that is, how you feel on the average. Use the following scale to record your answers.

- | | |
|---------------|-------------|
| -Distressed | -Irritable |
| -Excited | -Alert |
| -Upset | -Ashamed |
| -Strong | -Inspired |
| -Guilty | -Nervous |
| -Scared | -Determined |
| -Interested | -Attentive |
| -Hostile | -Jittery |
| -Enthusiastic | -Active |
| -Proud | -Afraid |

Job in General Scale (Ironson et al., 1989)

Instructions: Please indicate whether each adjective listed below is: descriptive of your job (yes), not descriptive of your job (no), or undecided (?).

- | | |
|------------------|-------------------|
| -Pleasant | -Better than most |
| -Bad | -Disagreeable |
| -Ideal | -Makes me content |
| -Waste of time | -Inadequate |
| -Good | -Excellent |
| -Undesirable | -Rotten |
| -Worthwhile | -Enjoyable |
| -Worse than most | -Poor |
| -Acceptable | -Superior |

APPENDIX B

- List of Primary Care Trusts
- NRES Approval Letter
- Approval Letters of PCTs
- Cover Letter (Study three)
- Reminder Letter (Study three)
- Participant Information Sheet (Study three)
- Participant Information Sheet (Study two)
- Participant Information Sheet (Study one)

List of Primary Care Trusts (PCTs)

Primary Care Trusts	Dmft	Population
Hartlepool	1.20	90,000
Wirral	1.65	313,000
Halton and St. Helens	2.09	296,000
Ashton, Leigh and Wigan	2.11	305,000
Bury	1.98	182,000
Trafford	1.59	213,000
Oldham	2.60	218,000
Sheffield	1.72	516,000
Coventry Teaching	1.15	304,000
Herefordshire	1.78	178,000
Worcestershire	.84	552,000
Norfolk	1.35	718,000
West Essex	.66	269,000
Berkshire West	1.37	441,000
Oxfordshire	1.07	595,000
Hillingdon	2.36	249,000
Hounslow	2.05	212,000
Lambeth	1.66	268,000
Kingston	1.38	152,000
Croyden	1.30	340,000



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11.01.2008

Rebecca Harris
School of Dentistry

Dear Rebecca

I am pleased to confirm that your research study 'Investigating personality traits and personal goals and how these predict dental students' has received formal faculty approval and that having consulted with the insurance broker, I can also confirm that the University professional indemnity and clinical trials insurances will apply to the project as appropriate.

With regards

Mrs L Carter
Research Co-ordinator
Faculty of Medicine Support Office

CC. Alexander Montasem

FW: RETH000204

Montasem, Alexander

Sent: 07 July 2011 18:00

To: Montasem, Alexander

From: Ethics

Sent: 06 January 2009 12:21

To: Harris, Rebecca

Cc: Montasem, Alexander

Subject: RE: RETH000204

Dear Rebecca and Alexander

I am pleased to inform you that the Sub-Committee has approved your application for ethical approval. Details and conditions of the approval can be found below.

Please ensure that you send a signed copy of the final version , with all supporting documentation, to the Research Governance Officer, Contract Services, Legal Services, Foresight Building, Liverpool, L69 3GL.

Ref:	RETH000204
Sub-Committee:	Non-Invasive Procedures
PI:	Dr Rebecca Harris
Title:	The influence of personality traits on dental student's well-being and happiness
First Reviewer:	Dr Demian Whiting
Second Reviewer:	Dr Joe Spencer
Date of initial review:	6/1/09
Date of Approval:	06/01/09

The application was APPROVED subject to the following conditions:

Conditions

- | | | |
|---|-----------|--|
| 1 | Mandatory | M: All serious adverse events must be reported to the Sub-Committee within 24 hours of their occurrence, via the Research Governance Officer (ethics@liv.ac.uk). |
| 2 | Advisory | A: Participants should be given (ideally on the questionnaire) details of to whom they are to hand in / or send their completed questionnaires. |

This approval applies for the duration of the research. If it is proposed to extend the duration of the study as specified in the application form, the Sub-Committee should be notified. If it is proposed to make an amendment to the research, you should notify the Sub-Committee by following the Notice of Amendment procedure outlined at <http://www.liv.ac.uk/researchethics/amendment%20procedure%209-07.doc>.

If the named PI / Supervisor leaves the employment of the University during the course of this approval, the approval will lapse. Therefore please contact the RGO at ethics@liverpool.ac.uk in order to notify them of a change in PI / Supervisor.

Best Wishes

Sarah

Miss Sarah Louise Fletcher
Research Governance Officer
Legal Services
University of Liverpool
Liverpool L69 3GL

Tel. 0151 794 8290
Fax 0151 794 8728

Ethics email: ethics@liverpool.ac.uk

Website: www.liv.ac.uk/researchethics



PARTICIPANT INFORMATION SHEET

Study into Dental Student's Well-Being

You are being invited to take part in a research study being undertaken by researchers at the University of Liverpool Dental School. Before you decide if you wish to take part, we would like to give you some information about the study and its purpose. Please take time to read the following information carefully and feel free to ask us if you would like more information or if there is anything that you do not understand. We would like to stress that you do not have to accept this invitation and should only agree to take part if you want to. Thank you for taking the time to read this.

The purpose of the research is:

1. To identify issues relating to the way how dental students perceive well being.
2. To study work and life goals of dental students in relation to well being.
3. To look at changes and differences among dental students goal attainment and well being.
4. To improve dental student's well being and goal attainment through future support systems.

The overall study will be carried out in two phases:

Phase 1: self-report questionnaires

Phase 2: 60 days later, self-report questionnaires

Why have I been chosen to take part?

This study is about dental students in a dental school. You are approached to participate because you are a full-time student in the Liverpool School of Dentistry.

Do I have to take part?

Participation in the study is entirely voluntary, but the more complete our information is, the more likely it is that we can produce valid findings which will be used to improve the quality of life for future generations of dental students.

If you wish to take part, then you will be asked to answer questions on a self-report questionnaire and to sign a consent form. You may withdraw from the study at any time and without giving reason.

What will happen if I take part?

Self-report questionnaires together with a consent form will be handed out. You are kindly requested to answer some questions about yourself and to state 4 work and life goals. The possible

answers are presented on scales (usually ranging from 1 to 7). The overall time for filling in the form is estimated to be up to 45 minutes. A researcher will then collect the questionnaires together with the consent form.

60 days later, you are again kindly requested to answer a shorter version of self-report questionnaires. This will take approximately 15 minutes.

Are there any risks in taking part?

There is not a risk to take part in this study. Should you experience for whatever reason experience any unease on account of the study, you should make this known to the researchers involved (Dr Rebecca Harris, Alexander Montasem) or contact your personal tutor.

Can I be identified?

All material from this research will be treated **confidentially and anonymously**, and will be handled by suitably trained and experienced researchers at the University of Liverpool in accordance with the Data Protection Act. The information is coded so that you cannot be identified as a participant. This study has been granted the appropriate ethical approval by the University of Liverpool committee.

What will happen if I want to stop taking part?

You can withdraw at anytime without explanation. Results up to the period of withdrawal may be used, if you are happy for this to be done. Otherwise you may request that they are destroyed and no further use is made of them.

What will happen to the results of the study?

The outcomes of this study will be published and reported irrespective of the nature of the findings, and will be made available to all participants on request. Paper will be published in academic journals.

Further information?

You will be given a copy of this information sheet and a copy of your signed consent form to keep. If you have any queries or require further information relating to the project then please email Alexander Montasem at monti@liv.ac.uk or alternatively Dr Rebecca Harris at r.v.harris@liv.ac.uk or contact us at the University of Liverpool School of Dentistry, 5th Floor, Pembroke Place, Liverpool L3 5PS, Tel: 0151 706 5277.

Thank you very much for your time in taking part in this study.

Dr Rebecca Harris, Senior Lecturer in Dental Public Health;

Alexander Montasem, Postgraduate Researcher

PARTICIPANT INFORMATION SHEET

You are being invited to take part in a research study being undertaken by researchers at the University of Liverpool Dental School. Before you decide if you wish to take part, we would like to give you some information about the study and its purpose. Please take time to read the following information carefully and feel free to ask us if you would like more information or if there is anything that you do not understand. We would like to stress, that you do not have to accept this invitation and should only agree to take part, if you want to. Thank you for taking the time to read this.

1. What is the purpose of this study?

The research project aims to investigate dental undergraduate's personality and how this affects well-being. Previous research has shown that well-being and health are important factors during dental/medical training. Results are expected to deepen our understanding of how personality and well-being are interlinked and indicate areas where dental student support is needed.

2. Why have I been chosen to take part?

This study is about dental students in a dental school. You are approached to participate, because you are a full-time student in the Liverpool School of Dentistry.

3. Do I have to take part and what happen if I stop taking part?

Your participation is voluntary. If you decide to take part you are still free to withdraw (leave the study) at any time without giving an explanation and without incurring any disadvantages.

4. What will happen if I take part?

If you decide to take part, you are welcome to keep a copy of the participant information. Then, you will be asked to complete a questionnaire that should not take more than 10-15 minutes.

5. Expenses and/or payments?

Participants will not receive any expense or payment for participating in the study.

6. What are the possible disadvantages and risks in taking part?

There are no definite risks involved. It is conceivable that you may find answering questions about personal issues challenging, but if you are in any way unhappy with the questionnaire, then you need not complete or hand in the questionnaire. If the questionnaire does raise some issues for you then you might consider getting in touch with your personal tutor, the support services found on University's Student Support Services website (www.liv.ac.uk/studentssupport/) or your GP. Some of these support services are: **Mental Health Advisory Service:** 0151 794 2320; **International Support Team:** 0151 794 5863; **University Counselling Service:** 0151 794 3304; **Your GP.**

7. What are the possible benefits in taking part?

There are no direct benefits for you. However, by learning about dental students' well-being, we hope to help the relevant organisations to develop services that better meet the needs of dental students in the UK.

8. Will my participation be kept confidential?

The questionnaire is designed for **confidential anonymous completion**. There is no identifier on the questionnaire therefore **you cannot be identified** by anyone involved in the study at any stage. All study data in manual form is kept stored in a locked filing cabinet in a locked room. The electronic data will be stored on a password protected computer with anti-virus software. The data will not be taken out of the University. The data will be kept for 5 years in accordance with University Regulations. The department statistician will be responsible for the retention of the data.

9. What will happen if I want to stop taking part?

You can withdraw at anytime without explanation. Results up to the period of withdrawal may be used, if you are happy for this to be done. Otherwise you may request that they are destroyed and no further use is made of them.

10. What if I am unhappy or there is a problem?

There are no special compensation arrangements. Regardless of this, if you are unhappy, or if there is a problem, please feel free to let us know (see contact details below) and we will try to help. If you remain unhappy or have a complaint which you feel you cannot come to us with, then you should contact the Research Governance Officer on 0151 794 8290 or email: Ethics@liv.ac.uk

When contacting the Research Governance Officer, please provide details of the name or description of the study (so that it can be identified), the researcher(s) involved and the details of the complaint you wish to make.

11. What will happen to the results of the study?

The results of this research project may, on completion, be published in an appropriate peer reviewed journal, but you will not be personally identified in any report/publication, as all data sets are anonymised.

12. Who can I contact if I have further questions?

If you have any queries or require further information about the research, please feel free to email Alexander Montasem (Postgraduate Researcher) at monti@liv.ac.uk or Dr Rebecca Harris (Senior Lecturer in Dental Public Health) at r.v.harris@liv.ac.uk or contact us at the University of Liverpool School of Dentistry, 4th and 5th Floor, Pembroke Place, Liverpool L3 5PS, Tel: 0151 706 5070 or 5099.

-----Thank you for reading this information-----

National Research Ethics Service

North West 3 Research Ethics Committee - Liverpool East

Bishop Goss Complex
Victoria Building
Rose Place
Liverpool
L3 3AN

Telephone: 0151 330 2077
Facsimile: 0151 330 2075

01 October 2009

Dr Rebecca Harris
Senior Lecturer in Dental Public Health
University of Liverpool, School of Dentistry
Pembroke Place, 4th Floor
Liverpool
Merseyside
L3 5PS

Dear Dr Harris

Study Title: Personal values, personality traits, job satisfaction and well-being among dentists working in different organisation settings in England.
REC reference number: 09/H1002/66
Protocol number: 2

Thank you for your letter of 21 September 2009, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Ethical review of research sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

For NHS research sites only, management permission for research ("R&D approval") should be obtained from the relevant care organisation(s) in accordance with NHS research

This Research Ethics Committee is an advisory committee to North West Strategic Health Authority

governance arrangements. Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at <http://www.rforum.nhs.uk>. Where the only involvement of the NHS organisation is as a Participant Identification Centre, management permission for research is not required but the R&D office should be notified of the study. Guidance should be sought from the R&D office where necessary.

Sponsors are not required to notify the Committee of approvals from host organisations.

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

<i>Document</i>	<i>Version</i>	<i>Date</i>
SP Consent Q		11 June 2009
Participant Consent Form	1	22 July 2009
Participant Information Sheet	1	22 July 2009
Letter of invitation to participant	1	22 July 2009
Covering Letter		22 July 2009
Protocol	1	22 July 2009
Investigator CV		22 July 2009
REC application	2.2	30 July 2009
Covering Letter		21 September 2009
Protocol	2	22 June 2009
Participant Information Sheet		
Letter From Dr Harris		
Response to Request for Further Information		

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Now that you have completed the application process please visit the National Research Ethics Service website > After Review

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

The attached document "*After ethical review – guidance for researchers*" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

We would also like to inform you that we consult regularly with stakeholders to improve our service. If you would like to join our Reference Group please email referencegroup@nres.npsa.nhs.uk.

09/H1002/66

Please quote this number on all correspondence

Yours sincerely



JH
Mrs Jean Harkin
Chair

Email: Ronald.Wall@liverpoolpct.nhs.uk

Enclosures:

"After ethical review – guidance for researchers"

Copy to:

Mrs Sarah Fletcher, University of Liverpool
G Marr, R & D, Liverpool pct

LIVERPOOL

Legal Services Reference: SP000404
Faculty of Medicine Reference: UoL000476

Miss S L Fletther
Research Governance Officer
Contract Services
Legal Services

Thursday, 11 June 2009

Dr Rebecca Harris School
of Dental Sciences

The Foresight Building
3 Brownlow Street
Liverpool L69 3GL

Telephone: +44 (0) 151 7948790
Facsimile: +44 (0) 151 7948728 Email:
ethics@liverpool.ac.uk

Dear Dr Harris

I am pleased to confirm that the University is prepared to act as Sponsor under the Department of Health's Research Governance Framework for Health and Social Care (2005) for your study entitled "Personal values, personality traits, job satisfaction and well-being among dentists working in different organisational settings in England.". This approval for sponsorship is subject to the following.

1. The University expects you, as Chief Investigator, to conduct the study in full compliance with the requirements of the Framework so that it is able to meet its obligations as Sponsor.
2. University professional indemnity and clinical trials insurances will apply to the study as appropriate. This is on the assumption that no part of the study will take place outside of the UK.
3. If you wish to conduct any part of the study in a site outside the UK, or you wish to subcontract any part of the study to a third party you must contact Contract Services in the first instance to ensure that appropriate contractual arrangements are in place.
4. If you have not already done so, the NRES (National Research Ethics Service) application form for NHS ethical approval of this study should be sent to Contract Services for the Declaration of Sponsor to be signed and completed by the University. You may confirm to NRES that the insurances described in paragraph 2 above will extend to cover for nonnegligent harm.
5. As the Chief Investigator, the University expects you to comply, where appropriate, with the University's policy on the use and / or storage of human tissues, details of which may be found at www.liverpool.ac.uk/humantissues.

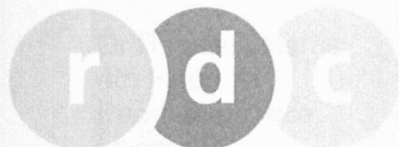
I trust that this statement will enable you to proceed with your research but if you have any queries please contact me on 0151 794 8290 (email stletta@liverpool.ac.uk). For general queries relating to University sponsorship please contact the Faculty of Medicine Research Support Office at medresteam@liverpool.ac.uk.

Yours sincerely



Miss Sarah Fletcher Research
Governance Officer

Cc Head of School, Dental Sciences
Mrs Lindsay Carter, Research Coordinator, Faculty of Medicine Support Office



Southwark
Public Health Department
Hub 2 1st Floor
PO Box 64529
London
SE1P 5LX
Tel: 020 7525 0289
Fax: 020 7525 0318

email: anne.grant@southwarkpct.nhs.uk
www.researchdevelopmentcentre.nhs.uk

Dr Rebecca Harris
University of Liverpool
School of Dental Services
Pembroke Place
Dental Hospital 4th floor
Liverpool
L3 5PS

22nd October 2009

Dear Dr Harris

Project Title: Personal values, personality traits, job satisfaction and well-being among dentists working in different organisation settings in England
R & D Reference: RDLAM 509

Thank you for your assistance providing the documentation for the scrutiny of this project.

I am satisfied that this study meets with the requirements of the Research Governance Framework. It has been approved by the research lead for the respective NHS organisation.

Approval is given on behalf of NHS Lambeth on the understanding that you adhere to the conditions on the attached document. The end date of the project is listed as 1st June 2010

If you require any further information, please contact Dr Anne Grant on 020 7525 0289.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Hiten Dodhia'.

Hiten Dodhia

Consultant in Public Health and R&D lead for NHS Lambeth
Chair of the Research Management Group for South East London NHS
Bexley, Bromley, Greenwich, Lambeth, Lewisham & Southwark

East Norfolk and Waveney Research
Governance Committee



Dr Rebecca Harris
4th Floor
Pembroke Place
Liverpool
Merseyside
L3 5PS

Please reply to: Research Governance Committee Office
Research and Development Department
Level 3, East Block, Room 032
Norfolk & Norwich University Hospitals NHS Foundation Trust
Colney Lane
Norwich
NR4 7UY
Direct Dial: 01603 287408
Internal: 3408
Direct Fax: 01603 289800

26/10/2009

e-mail: rdoffice@nnuh.nhs.uk
Website: www.norfolkhealthresearch.nhs.uk

Dear Dr Harris

Re: 2009IC02 (185-10-09) Personal values, personality traits, job satisfaction and well-being among dentists working in different organisation settings in England.

Thank you for submitting the above project to the East Norfolk and Waveney Research Governance Committee for approval. On behalf of the Committee I am pleased to inform you that your project has been given full approval and you may begin your research.

Please note that this approval applies to the following sites:

- NHS Norfolk

I have enclosed two copies of the Standard Terms and Conditions of Approval. Please sign and return one copy to the Research Governance office. Failure to return the standard terms and conditions may affect the conditions of approval.

Please note, under the agreed standard terms and conditions of approval you must inform this Committee of any proposed changes to this study and to keep the Committee updated on progress.

If you have any queries regarding this or any other project please contact Julie Dawson, Research Governance Administrator, at the above address. Please note, the reference number for this study is **2009IC02 (185-10-09)** and this should be quoted on all correspondence.

Yours sincerely

Dr Richard Reading
Chair
Consultant Paediatrician – NHS Norfolk

Enc

Mr Alexander Montasem
Pembroke Place
Dental Hospital
5th Floor
L3 5PS

Research and Development Department
St Catherine's Hospital
Church Road
Birkenhead
CH42 0LQ

Tel: 0151 651 3935

Date: 5 November 2009

Human Resources Directorate

Dear Mr Montasem

Letter of access for research study entitled 'Personal values, personality traits, job satisfaction and wellbeing among dentists working in different organisation settings in England.'

This letter confirms your right of access to conduct research through NHS Wirral for the purpose and on the terms and conditions set out below. This right of access commences on 5 November 2009 and ends on 30 June 2010 unless terminated earlier in accordance with the clauses below.

You have right of access to conduct such research as confirmed in writing in the letter of permission for research from this NHS organisation. Please note that you cannot start the research until the Principal Investigator for the research project has received a letter from us giving permission to conduct the project.

The information supplied about your role in research at NHS Wirral has been reviewed and you do not require an honorary research contract with this NHS organisation. We are satisfied that such a pre-engagement checks as we consider necessary have been carried out.

You are considered to be a legal visitor to NHS Wirral premises. You are not entitled to any form of payment or access to other benefits provided by this NHS organisation to employees and this letter does not give rise to any other relationship between you and this NHS organisation, in particular that of an employee.

While undertaking your research through NHS Wirral, you will remain accountable to your employer The University of Liverpool but you are required to follow the reasonable instructions of Will Sopwith in this NHS organisation or those given on her/his behalf in relation to the terms of this right of access.

Where any third party claim is made, whether or not legal proceedings are issued, arising out of or in connection with your right of access, you are required to co-operate fully with any investigation by this NHS organisation in connection with any such claim and to give all such assistance as may reasonably be required regarding the conduct of any legal proceedings.

You must act in accordance with NHS Wirral policies and procedures, which are available to you upon request, and the Research Governance Framework.

You are required to co-operate with NHS Wirral in discharging its duties under the Health and Safety at Work etc Act 1974 and other health and safety legislation and to take responsible care for the health and safety of yourself and others while on NHS Wirral premises. You must observe the same standards of care and propriety in dealing with patients, staff, visitors, equipment and premises as is expected of any other contract holder and you must act appropriately, responsibly and professionally at all times.

4th November 2009

Dr Rebecca Harris
Senior Lecturer in Dental Public Health
University of Liverpool, School of Dentistry
Pembroke Place, 4th Floor
Liverpool
Merseyside
L3 5PS

NHS West Essex Primary Care Trust
Research and Development Department
Unit 59, Latton Bush Centre
Southern Way, Harlow
Essex, CM18 7BL
Tel 01279 410 496

Cc

- Caroline Gunnell (by email)
- Alexander Montasem (by email)

Dear Dr Harris

Personal values, personality traits, job satisfaction and well-being among dentists working in different organisational settings in England

Project Reference Number	NP0908-S1
NRES Reference Number	09/H1002/66
Research Ethics Committee Approval Letters	Approval letter from: North West 3 Research Ethics Committee – Liverpool East Date: 1 st October 2009
Sponsor	University of Liverpool
Approved Research Site	<ul style="list-style-type: none"> • Workplaces of dentists within NHS West Essex

This letter is issued on behalf of West Essex PCT, and I am pleased to confirm that the above study (defined by those documents listed above) now has permission to proceed at the above site.

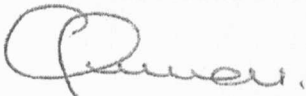
Please note that this permission only relates to West Essex PCT. If your research involves other organisations then you are recommended to contact them to find out if you require their permission.

The responsibilities for Chief Investigator, Principal Investigator and other researchers are described in the Research Governance Framework for Health and Social Care. Conditions specific to West Essex PCT are given overleaf.

Very best wishes for your study, and please do not hesitate to contact me for any assistance during the project.

Yours sincerely,

Caroline Gunnell



Research Advisor
West Essex PCT Research and Development Department
Unit 59, Latton Bush Centre, Southern Way, Harlow CM18 7BL
01279 410 496
Caroline.Gunnell@westessexpct.nhs.uk



Wandsworth

Wandsworth Primary Care Research Centre
Mapleton Centre, 88-92 Garratt Lane
Wandsworth, London
SW18 4DJ
Tel: 020 8812 5046/7
Fax: 020 8812 5048

Dr Rebecca Harris
Senior Lecturer in Dental Public Health
University of Liverpool, School of Dentistry
Pembroke Place, 4th Floor,
Liverpool
Merseyside
L3 5PS

Dear Dr Harris,

Chief investigator: Dr Ruth Harris

Project title: Personal values, personality traits, job satisfaction and well-being among dentists working in different organisation settings in England

R&D Reference: 2009/ 338/ C, K

REC reference: 09/ H1002/ 66

Thank you for providing us with the documentation relating to your research project. Wandsworth PCT is the lead Research Management & Governance PCT for the SW London PCTs and provides approval on behalf of Wandsworth, Richmond & Twickenham, Kingston, Croydon and Sutton & Merton PCTs.

I am satisfied that your proposal and documentation meet with the requirements of the Research Governance Framework (DH 2005) and approve your project on behalf of Croydon PCT and Kingston PCT, subject to the conditions listed below.

If you require any further information, do not hesitate to contact Maggie Elliott, Research Governance Coordinator or Amy Scammell Research Manager on 020 8812 5042.

Yours sincerely,


Dr Andy Neil
Joint Medical Director WPCT, Chair WPCT Clinical Effectiveness Committee

Primary Care Trust

Working with our partners for a healthier
Brent

Applied Research Unit

Wembley Centre for Health & Care
116 Chaplin Road
Wembley
Middlesex
HA0 4UZ

Tel: 020 8795 6730/5

Fax: 020 8795 6737

Dr Rebecca Harris
Pembroke Place, 4th Floor
University of Liverpool
Liverpool
Merseyside
L3 5PS

Email: ricky.banarsee@brentpct.nhs.uk

19th October 2009

Dear Dr Harris

Project Personal values, personality traits, job satisfaction and well-being
Title: among dentists working in different organisation settings in England.
REC 09/H1002/66
Portfolio No Non NIHR Portfolio CSP No N/A

Thank you for your assistance providing the documentation for the scrutiny of the proposal.

I am satisfied that your proposal meets with the requirements of the Research Governance Framework (RGF). The NW London RG Unit has approved your proposal on behalf of Hillingdon and Hounslow PCTs on the understanding that you adhere to the RGF conditions on the attached document.

The end date of the project is listed as May 2010

The documents received and approved were: -

Ethics application form and SSIF CI and sponsor signed electronically V2	23/07/09
North West 3 Research Ethics Service favourable ethical opinion letter	01/10/09
SSIF form electronically signed	23/07/09
Sponsorship letter University of Liverpool	11/06/09
CVs for Rebecca Harris (CI) and Alexander Montasem (PhD student)	
Protocol V2	22/06/09
Participants information letter V2	22/06/09
Cover letter to dentists V1	22/07/09
Validated questionnaire V1	22/06/09
Letter of invitation to participants V2	22/06/09

Dr Rebecca Harris
University of Liverpool
School of Dentistry
Pembroke Place
4th Floor
Liverpool
Merseyside L3 5PS

14 October 2009

Dear Dr Harris

Re: Personal values, personality traits, job satisfaction and well-being among dentists working in different organisation settings in England – 09/H1002/66

Following receipt of all the relevant documents the Thames Valley Partnership agrees to the above research project commencing in:

Oxfordshire PCT
Berkshire East PCT
Berkshire West PCT.

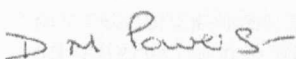
This agreement is conditional on the above project having full ethical approval

You must inform the Thames Valley Office of any SUSARs which arise as a result of the project.

Copies of any report and subsequent publications that arise from the above project, preferably electronically, should be sent to the Thames Valley office at the end of the project, these reports will be made available, from the office, on request to members of the PCT and the public.

We would like to wish you every success with the project and look forward to seeing the results.

Yours sincerely



Dot Powers
Research Governance Manager, Thames Valley Primary Care Partnership

West Midlands (South) Comprehensive Local Research Network
Fourth Floor Rotunda (ADA40017)
University Hospitals Coventry & Warwickshire NHS Trust
University Hospital
Clifford Bridge Road
Coventry
CV2 2DX

09th October 2009

Dr Rebecca Harris
Senior Lecturer in Dental Public Health
University of Liverpool
School of Dentistry
Pembroke Place, 4th Floor
Liverpool
Merseyside
L3 5PS

Dear Dr Harris

Project Title: Values, Personality, Job Satisfaction and Well-Being amongst Dentists

R&D Ref: WMS280709

REC Ref: 09/H1002/66

I am pleased to inform you that the R&D review of the above project is complete and has been formally approved to be undertaken at Herefordshire Primary Care Trust. Your research activity is now covered by NHS indemnity as set out in HSG (96) 48, and your trial has been entered onto the Trust's database.

The following documents were reviewed:

- **Protocol** Version 2, 22nd June 2009
- **Invitation Letter** Version 2, 22nd June 2009
- **Questionnaire** Version 1, June 2009
- **Participant Information Sheet** Version 2, 22nd June 2009
- **R&D Application Form** Lock code 26057/51949/14/934 with signed declarations
- **Site Specific Information Form** Lock code 26057/52735/6/488/26152/147296
- **REC Approval Letter** Dated 1st October 2009 (re-issued)
- **Confirmation of Sponsorship and Indemnity** 11th June 2009
- **CVs for Alexander Montasem and Dr Rebecca Harris** signed and dated

Your responsibilities are set out in the attached agreement, which must be signed and returned to the R&D Office. You should keep a copy for your records.

All research must be managed in accordance with the requirements of the Department of Health's Research Governance Framework (RGF) and to ICH-GCP standards. In order to ensure that research is carried out to these standards, the

West Midlands South Comprehensive Local Research Network
CLRN Office
Fourth Floor Rotunda (ADA40017)
University Hospitals Coventry & Warwickshire NHS Trust
University Hospital
Clifford Bridge Road
Coventry
CV2 2DX

Tel: 02476 967549
Fax: 02476 96 6201

Mr Alexander Montasem
University of Liverpool
School of Dentistry
Pembroke Place, 4th Floor
Liverpool
Merseyside
L3 5PS

12th October 2009

Dear Alex,

Re: Values, Personality, Job Satisfaction and Well-Being amongst Dentists

Letter of access for research

This letter confirms your right of access to conduct research through Coventry Teaching Primary Care Trust for the purpose and on the terms and conditions set out below. This right of access commences on 12th October 2009 and ends on 30th June 2010 unless terminated earlier in accordance with the clauses below.

You have a right of access to conduct such research as confirmed in writing in the letter of permission for research from this NHS organisation. Please note that you cannot start the research until the Principal Investigator for the research project has received a letter from us giving permission to conduct the project.

The information supplied about your role in research at Coventry Teaching Primary Care Trust has been reviewed and you do not require an honorary research contract with this NHS organisation. We are satisfied that such pre-engagement checks as we consider necessary have been carried out.

You are considered to be a legal visitor to Coventry Teaching Primary Care Trust premises. You are not entitled to any form of payment or access to other benefits provided by this NHS organisation to employees and this letter does not give rise to any other relationship between you and this NHS organisation, in particular that of an employee.

While undertaking research through Coventry Teaching Primary Care Trust, you will remain accountable to your employer University of Liverpool but you are required to follow the reasonable instructions of Dr Peter Barker in this NHS organisation or those given on her/his behalf in relation to the terms of this right of access.



Halton and St Helens

Mr Alexander Montasem
Pembroke Place
Dental Hospital
5th Floor
L3 5PS

Research and Development Department
Midwood House
Suite 1, Unit 1H
Midwood Street
Widnes
WA8 6BH

Date: 5 November 2009

Human Resources Directorate

Dear Mr Montasem

Letter of access for research study entitled 'Personal values, personality traits, job satisfaction and wellbeing among dentists working in different organisation settings in England.'

This letter confirms your right of access to conduct research through NHS Halton and St Helens for the purpose and on the terms and conditions set out below. This right of access commences on 5 November 2009 and ends on 30 June 2010 unless terminated earlier in accordance with the clauses below.

You have right of access to conduct such research as confirmed in writing in the letter of permission for research from this NHS organisation. Please note that you cannot start the research until the Principal Investigator for the research project has received a letter from us giving permission to conduct the project.

The information supplied about your role in research at NHS Halton and St Helens has been reviewed and you do not require an honorary research contract with this NHS organisation. We are satisfied that such a pre-engagement checks as we consider necessary have been carried out.

You are considered to be a legal visitor to NHS Halton and St Helens premises. You are not entitled to any form of payment or access to other benefits provided by this NHS organisation to employees and this letter does not give rise to any other relationship between you and this NHS organisation, in particular that of an employee.

While undertaking your research through NHS Halton and St Helens, you will remain accountable to your employer The University of Liverpool but you are required to follow the reasonable instructions of Kirsty Pine in this NHS organisation or those given on her/his behalf in relation to the terms of this right of access.

Where any third party claim is made, whether or not legal proceedings are issued, arising out of or in connection with your right of access, you are required to co-operate fully with any investigation by this NHS organisation in connection with any such claim and to give all such assistance as may reasonably be required regarding the conduct of any legal proceedings.

You must act in accordance with NHS Halton and St Helens policies and procedures, which are available to you upon request, and the Research Governance Framework.

You are required to co-operate with NHS Halton and St Helens in discharging its duties under the Health and Safety at Work etc Act 1974 and other health and safety legislation and to take responsible care for the health and safety of yourself and others while on NHS Halton and St Helens premises. You must observe the same standards of care and propriety in dealing with patients, staff, visitors, equipment and premises as is expected of any other contract holder and you must act appropriately, responsibly and professionally at all times.

West Midlands South Comprehensive Local Research Network
CLRN Office
Fourth Floor Rotunda (ADA40017)
University Hospitals Coventry & Warwickshire NHS Trust
University Hospital
Clifford Bridge Road
Coventry
CV2 2DX

Tel: 02476 967549

Fax: 02476 96 6201

Mr Alexander Montasem
University of Liverpool
School of Dentistry
Pembroke Place, 4th Floor
Liverpool
Merseyside
L3 5PS

16th October 2009

Dear Alex,

Re: Values, Personality, Job Satisfaction and Well-Being amongst Dentists

Letter of access for research

This letter confirms your right of access to conduct research through Worcestershire Primary Care Trust for the purpose and on the terms and conditions set out below. This right of access commences on 16th October 2009 and ends on 30th June 2010 unless terminated earlier in accordance with the clauses below.

You have a right of access to conduct such research as confirmed in writing in the letter of permission for research from this NHS organisation. Please note that you cannot start the research until the Principal Investigator for the research project has received a letter from us giving permission to conduct the project.

The information supplied about your role in research at Worcestershire Primary Care Trust has been reviewed and you do not require an honorary research contract with this NHS organisation. We are satisfied that such pre-engagement checks as we consider necessary have been carried out.

You are considered to be a legal visitor to Worcestershire Primary Care Trust premises. You are not entitled to any form of payment or access to other benefits provided by this NHS organisation to employees and this letter does not give rise to any other relationship between you and this NHS organisation, in particular that of an employee.

While undertaking research through Worcestershire Primary Care Trust, you will remain accountable to your employer University of Liverpool but you are required to follow the reasonable instructions of Ms Sandra Rote in this NHS organisation or those given on her/his behalf in relation to the terms of this right of access.



Sheffield Health and Social Care **NHS**

NHS Foundation Trust

MEDICAL DIRECTORATE

Research Development Unit

6 October 2009

Dr Rebecca Harris
Liverpool University School of Dental Sciences
Pembroke Place
Liverpool L3 5PS

Fulwood House
Old Fulwood Road
SHEFFIELD
S10 3TH

Tel: (0114) 2718804
Fax: (0114) 2716736
E-mail: shsrc@shsc.nhs.uk
www.shsrc.nhs.uk

Dear Dr Harris

Consortium Reference: ZK78

Full Project Title: **Personal values, personality traits, job satisfaction and wellbeing among dentists working in different organisation settings in England.**

You now have **Research Governance approval from this Consortium** to carry out research as described in documentation you have supplied to us.

We also advise you of the following conditions which apply to all receiving Research Governance Approval through the Consortium:

1. Please inform us of the actual project start date immediately you do start and at that time inform us also of the expected end date.
2. In order to comply with the NHS Research Governance Framework, please copy the Consortium into all future project monitoring forms that you send to the relevant Research Ethics Committee, including the "Declaration of End of Study".
3. The Consortium recommends the attached format for maintenance of your project site file to ensure all documentation is readily accessible.
4. You will also need to seek approval for every future change to protocol or project title and I suggest you do this by sending us a draft of the submission you will also have to make to the NHS REC and that you do so at the same time as that submission to the REC. See the following web reference for details:
<http://www.nres.npsa.nhs.uk/applicants/after-ethical-review/amendments/>
5. The Consortium recommends the attached amendment log in order to track amendment submissions to, and approvals from, the relevant REC and R&D office(s)
6. As Chief Investigator, you have an obligation to report all research-related adverse events directly to the Consortium.
7. As Chief Investigator, you are reminded of your obligations in relation to the Mental Capacity Act 2005. See the following web reference for details:
www.rdforum.nhs.uk/docs/mca_guidance.doc

Our Reference RE-MM616
Your Reference

Direct line 0191 374 4211
Main number 0191 374 4103
Fax
E-mail richard.errington@nhs.net

County Durham & Tees Valley
Primary Care Trusts'
Research Management &
Governance Unit
County Durham PCT
John Snow House
University Science Park
Durham
DH1 3YG

Tel: 0191 301 1300
Fax: 0191 3744100
Safehaven Fax: 0191 374 4102
www.countydurhampct.nhs.uk

14 October 2009

Dr Rebecca Harris
University of Liverpool
4th Floor
Pembroke Place
Liverpool
L3 5PS

Dear Dr Harris

Personal values, personality traits, job satisfaction and well-being among dentists working in different organisation settings in England

Local R&D No: 0422
REC Ref: 09/H1002/66

The Research Management & Governance Unit of County Durham & Tees Valley Primary Care Trusts gives **approval** for this project to begin in **Hartlepool PCT** subject to the following conditions:

- Approval from the NHS National Research Ethics Service.
- Honorary Contracts have been issued where relevant.
- Any Accidents and Complaints related to the research are reported to the PCT(s) and RM&G Unit through the usual systems.
- Serious Adverse Events affecting local patients are reported to the PCT(s) and RM&G Unit promptly.

Lady Ann Calman, Chair
Yasmin Chaudhry, Chief Executive

Commissioning for the health of the people of County Durt

PARTICIPANT INFORMATION SHEET

Study into personal values, well-being and job satisfaction of dentists working in different work settings

You are being invited to take part in a research study being undertaken by researchers at the University of Liverpool Dental School. Before you decide if you wish to take part we would like to give you some information about the study and its purpose.

The purpose of the research is:

To investigate the personality and values of dentists in different working environments, and to identify the type of values most likely to lead to a fulfilling career in various branches of dentistry.

Why have you been chosen?

You have been invited to take part because you are a dentist working in one of the randomly chosen Primary Care Trusts in England.

What will happen if you do take part?

The study involves completion of a single (enclosed) questionnaire which takes about 15-20 minutes. A prepaid envelope for return of the questionnaire is enclosed.

Do you have to take part?

Participation is completely voluntary. You do not need to give a reason for deciding not to participate.

Expenses and/or payments?

Participants will not receive any expenses or payment for participating in the study.

What are the possible benefits of taking part?

We cannot promise the study will help you but the information we get from this study may have implications not only for the well-being and retention of manpower within the NHS general dental practice sector; but in addressing core issues relating to the social contract of dentists as professionals.

Can I be identified?

Your response will be anonymous, although questionnaires are coded so that we can send a reminder to those who do not reply after the initial mailing. However, you will not be able to be identified in any research reports because only summary data will be presented. Also, the coding sheet with identifiers will be held by the research secretary, and not accessed by anyone dealing with looking at your responses on the questionnaire. All material from this research will be handled by suitably trained and experienced researchers at the University of Liverpool in accordance with the Data Protection Act. This study has been granted the appropriate ethical approval through NRES (National Research Ethics Service).

What will happen if I want to stop taking part?

You can withdraw at anytime without explanation. If you decide to stop taking part you can request that your responses are destroyed and no further use is made of them.

What if there is a problem?

Any complaint about the way you have been dealt with during the study or any possible harm you might suffer will be addressed. Please feel free to either contact the research team or Mrs Sarah Fletcher, Research Governance Officer, University of Liverpool, Foresight Building, 3 Brownlow Street, Liverpool, L69 3GL, Tel: +44 151 794 8290.

What will happen to the results of the study?

The outcomes of this study will be published and reported irrespective of the nature of the findings, and will be made available to all participants on request. The research findings will be published in academic journals.

Who is organising and funding the research?

The research is funded by Merseyside Deanery and the Department of Medical Education, University of Liverpool.

Who has reviewed the study?

All research in the NHS is looked at by an independent group of people, called a Research Ethics Committee, to protect your interests. This study has been reviewed and given favourable opinion by Liverpool Paediatric Research Ethics Committee.

Further information?

If you have any queries or require further information relating to the project then please email Mr Alexander Montasem at monti@liv.ac.uk or alternatively Dr Rebecca Harris at r.v.harris@liv.ac.uk or contact us at the University of Liverpool School of Dental Sciences, 4th Floor, Pembroke Place, Liverpool L3 5PS, Tel: 0151 706 5099.

If you would like to speak to someone independent of the study for further information or to discuss any issues of concern you can:

contact Dr Brian Grieveson, Postgraduate Dean in Mersey, Mersey Deanery, Regatta Place, Brunswick Business Park, Summers Road, Liverpool L3 4BL, Tel: 0151 285 4700/4701, or email Brian.Grieveson@merseydeanery.nhs.uk

Thank you very much for your time to read these details.

Dr Rebecca Harris

Senior Lecturer/Honorary Consultant in Dental Public Health



School of Dental Sciences

Liverpool University Dental Hospital
Pembroke Place
Liverpool
L3 5PS

T 0151 706
F 0151 706 5652
W www.liv.ac.uk

15th October 2009

Dear colleague,

Following on from some recent research work on the job satisfaction of dental practitioners, we are undertaking some further work to look more closely at different working environments of dentists. We have developed the enclosed questionnaire which is being sent to a number of dentists from randomly selected areas of England, and we would really appreciate it if you would complete this and send it back in the enclosed envelope.

We are interested in how the different types of personality and value systems of dentists influence how happy they are working in different working environments. The findings of the study will help us better advise students on career choices.

The information is coded so that you cannot be identified as a participant. In order to follow up non-responders to the questionnaire a list of practitioners and codes will be kept by a secretary for follow up purposes only, and this will be destroyed once the data is collected. More details about the project are included in the enclosed information sheet which has been approved by the National Research Ethics Service (NRES).

Yours sincerely,

Dr Rebecca Harris

Senior Lecturer/Honorary Consultant in Dental Public Health
Department of Clinical Dental Sciences



PARTICIPANT INFORMATION SHEET

Study into personal values, well-being and job satisfaction of dentists working in different work settings

You are being invited to take part in a research study being undertaken by researchers at the University of Liverpool Dental School. Before you decide if you wish to take part we would like to give you some information about the study and its purpose.

The purpose of the research is:

To investigate the personality and values of dentists in different working environments, and to identify the type of values most likely to lead to a fulfilling career in various branches of dentistry.

Why have you been chosen?

You have been invited to take part because you are a dentist working in one of the randomly chosen Primary Care Trusts in England.

What will happen if you do take part?

The study involves completion of a single (enclosed) questionnaire which takes about 15-20 minutes. A prepaid envelope for return the questionnaire is enclosed.

Do you have to take part?

Participation is completely voluntary. You do not need to give a reason for deciding not to participate.

Expenses and/or payments?

Participants will not receive any expenses or payment for participating in the study.

What are the possible benefits of taking part?

We cannot promise the study will help you but the information we get from this study may have implications not only for the well-being and retention of manpower within the NHS general dental practice sector; but in addressing core issues relating to the social contract of dentists as professionals.

Can I be identified?

Your response will be anonymous, although questionnaires are coded so that we can send a reminder to those who do not reply after the initial mailing. However, you will not be able to be identified in any research reports because only summary data will be presented. Also, the coding sheet with identifiers will be held by the research secretary, and not accessed by anyone dealing with looking at your responses on the questionnaire. All material from this research will be handled by suitably trained and experienced researchers at the University of Liverpool in accordance with the Data Protection Act. This study has been granted the appropriate ethical approval through NRES (National Research Ethics Service).

What will happen if I want to stop taking part?

You can withdraw at anytime without explanation. If you decide to stop taking part you can request that your responses are destroyed and no further use is made of them.

What if there is a problem?

Any complaint about the way you have been dealt with during the study or any possible harm you might suffer will be addressed. Please feel free to either contact the research team or Mrs Sarah Fletcher, Research Governance Officer, University of Liverpool, Foresight Building, 3 Brownlow Street, Liverpool, L69 3GL, Tel: +44 151 794 8290.

What will happen to the results of the study?

The outcomes of this study will be published and reported irrespective of the nature of the findings, and will be made available to all participants on request. The research findings will be published in academic journals.

Who is organising and funding the research?

The research is funded by Merseyside Deanery and the Department of Medical Education, University of Liverpool.

Who has reviewed the study?

All research in the NHS is looked at by independent group of people, called a Research Ethics Committee, to protect your interests. This study has been reviewed and given favourable opinion by Liverpool Paediatric Research Ethics Committee.

Further information?

If you have any queries or require further information relating to the project then please email Mr Alexander Montasem at monti@liv.ac.uk or alternatively Dr Rebecca Harris at r.v.harris@liv.ac.uk or contact us at the University of Liverpool School of Dentistry, 4th Floor, Pembroke Place, Liverpool L3 5PS, Tel: 0151 706 5099.

If you would like to speak to someone independent of the study for further information or to discuss any issues of concern:

You can contact Dr Brian Grieveson, Postgraduate Dean in Mersey, Mersey Deanery, Regatta Place, Brunswick Business Park, Summers Road, Liverpool L3 4BL, Tel: 0151 285 4700/4701, or email Brian.Grieveson@merseydeanery.nhs.uk

Thank you very much for your time to read these details

Dr Rebecca Harris

Senior Lecturer/Honorary Consultant in Dental Public Health



Our ref: RVH/BS

28 January 2010

Dr Rebecca V Harris BDS, PhD
Senior Lecturer /
Honorary Consultant in
Dental Public Health

School of Dental Sciences

Dental Hospital
Pembroke Place
LIVERPOOL
L3 5PS

Tel 0151 706 5099
Fax 0151 706 5250
Email R.V.Harris@liv.ac.uk

Web www.liv.ac.uk

Dear Colleague

Re: QUESTIONNAIRE ON DENTISTS' WELL-BEING

You recently received a letter asking you to participate in a research study about different working environments of dentists. We have developed the enclosed questionnaire which is being sent to a number of dentists from randomly selected areas of England.

We are investigating how the different types of personality and value systems of dentists influence how happy they are working in different working environments. The findings of the study will help us better advise individuals on career choices.

So far we have not received a reply from you. The questionnaires were posted out at a time when there were some problems with the post, I wondered whether this might be a possible reason we had not heard back from you. Your response is really important to us and the success of the study, so I am enclosing another copy.

I would just like to also take this opportunity to emphasise that the information is coded in such a way as to remove identifying information and that you cannot be identified as a participant.

Yours sincerely

Dr RV Harris

Enc