Irrational Happiness Beliefs: Conceptualization, Measurement and its Relationship with Well-being, Personality, Coping Strategies, and Arousal

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Murat Yıldırım, MSc (Leicester)

Department of Neuroscience, Psychology, and Behaviour

University of Leicester

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Abstract

This thesis proposes a new psychological concept, *irrational happiness beliefs*, by developing a measure for irrational happiness beliefs and testing the usefulness of this measure within wider psychology. To this end, seven studies were conducted using cross-section, longitudinal, and experimental designs. A total of 1,305 participants – including students and community samples – completed measures of irrational happiness beliefs, valuing happiness, well-being, personality and coping. Study 1 sought to develop an irrational happiness beliefs measure, whereupon it was demonstrated that the irrational happiness beliefs measure is reliable and valid. Study 2 confirmed a unidimensional factor structure of irrational happiness beliefs. Study 3 and 4 tested the factor structure of irrational happiness beliefs against valuing happiness, subsequently indicating that irrational happiness beliefs and valuing happiness are two distinct-yet-related constructs. Study 5 sought to provide evidence of the role played by irrational happiness beliefs in predicting subjective well-being over time and its test-retest reliability, however the results of this study failed to offer evidence as to this predictive ability while an adequate test-retest reliability was found for the scale of $r = .72$. Study 6 set out to examine irrational happiness beliefs within the context of the adaptational-continuum model by using the Functional Dimensional Coping and Behavioural Inhibition System (BIS) and Behavioural Activation System (BAS) model of personality. The results of this study found that irrational happiness beliefs can be best described within the dimensions of the BAS personality and approach, emotional regulation and reappraisal copings. Study 7 aimed to investigate the effect of irrational happiness beliefs on arousal using the Cold Pressor Task, here revealing a medium effect of irrational happiness beliefs on arousal. Overall, the results suggest that the concept and measurement of irrational happiness

beliefs are useful in understanding negative aspects of happiness and its negative relation with well-being and positive psychological constructs.

Declaration

I hereby declare that this thesis has been composed by myself and that the research reported herein has been conducted by myself.

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Murat Yıldırım

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Chapter One

General Introduction

Using a wide range of methods and recruiting participants from different socioeconomic backgrounds, this thesis proposes the concept of *irrational happiness beliefs*, develops an irrational happiness beliefs measure, and explores the relationships network of irrational happiness beliefs within wider psychology. This chapter provides an introduction to happiness and an overview of the relevant research in this area, achieved by presenting the definitions, determinants, benefits, negative aspects, models, and measurements of happiness. The chapter also explores Rational Emotive Behavioural Theory and a number of its basic principles as underpin the concept of irrational happiness beliefs.

Definitions of Happiness

Happiness has been a topic of interest since ancient Greece and has continued, to date, to capture a great deal of attention from researchers within different fields of study. Various terms have been used to denote or identify happiness, whereupon the term of happiness is frequently used interchangeably with several closely associated terms including "subjective well-being", "life satisfaction", "well-being", and "quality of life". In this regard, happiness has been defined in a number of ways, with many aspects of happiness now being frequently used to define happiness. While some definitions cluster in relation to the affective components of happiness (e.g., Bradburn, 1969; Fordyce, 1988), others centre on the cognitive components of happiness (e.g., Diener, Emmons, Larsen & Griffin, 1985). A more integrative approach of defining happiness has been adopted by some, whereby happiness is viewed as both affect and cognition (e.g., Diener, Suh, Lucas & Smith, 1999), while others view happiness more broadly as an engagement

with life challenges (e.g., Ryff, 1989). With regards to the affective aspect of happiness, as represents emotional responses with short and fluctuating durations, earlier researchers viewed happiness as comprising both positive and negative affect – seeing these as related-yet-distinct constructs (Bradburn, 1969; Fordyce, 1988). For example, in this prior research, Bradburn (1969) indicated that balancing positive and negative affect is crucial for achieving one's happiness.

Although the positive and negative affect components of happiness are significant, they are inadequate if a full understanding of happiness is to be gained. With acknowledgement being given as to the importance of the role of affect upon happiness, recent research has shown that cognitive evaluation of one's life is also vital for one's well-being (e.g., Pavot, & Diener, 1993). The provision of cognitive evaluation as to one's life is conceptualised as "life satisfaction", as refers to cognition and as is viewed as the third component of happiness (Pavot & Diener, 1993). Unlike the affective element of happiness, life satisfaction is a relatively more stable element of happiness and relies on a global assessment of life quality. Hence, a tripartite model of happiness – as includes positive affect (e.g., optimism, hope), negative affect (e.g., anxious, distressed) and life satisfaction (e.g., global assessment of life) – has been proposed to comprehensively understand happiness (Diener, 1984; Diener et al., 1999). This model has been conceptualised as subjective well-being (SWB) and has been extensively emphasised, supported with a wealth of experimental evidence and remained popular within the discipline of positive psychology (Biswas-Diener, Kashdan & King, 2009). The central focus of SWB is that happiness is a personal experience of affect (emotion), a balance between positive and negative affect and the undertaking of a cognitive evaluation of life. According to this model, higher SWB is characterised as evaluation being given to one's

perceptions of high life satisfaction, a high intensity of positive affect and a low intensity of negative affect.

Another model that addresses happiness is Ryff's (1989) conceptualisation of well-being known as psychological well-being (PWB). The PWB is represented as including six different dimensions; autonomy, positive relations with others, environmental mastery, self-acceptance, personal growth and purpose in life. This representation of PWB is supported both theoretically and experimentally. These aspects signify what promotes effective mental and physical health for the healthy functioning of individuals, whereby figures with higher PWB are characterised as independent, capable of dealing with complex problems effectively within the given environment, having positive attitudes towards the self by acknowledging their own strengths and limitations, possessing a sense of personal development, building warm, trustworthy and rewarding relations with others and possessing meaning in life (Ryff, 1989, 1995; Ryff & Keyes, 1995).

Although different conceptualisations of happiness refer to different models of happiness, studies which have adopted divergent approaches to happiness have consistently provided evidence to support the notion that happiness is not just simply feeling good and instead that it has many positive outcomes in one's life across different domains (Biswas-Diener & Wiese, 2018). These domains can be both specific and general – such as health, social relationships, work life and marriage. According to Sooky et al. (2014), happiness leads to positive attitudes toward life, self and others, to better social relationships, to the possession of optimism towards the future and affect balance. This suggests that happiness is an important ingredient in one's positive functioning.

Determinants of Happiness

Happiness is an important concept and has thus captured the attention of many researchers. As a consequence, numerous endeavours have been made to identify the factors that determine happiness. Prior research has shown that a wide variety of factors affect people's happiness, as can be categorised as including (but not limited to) socio-demographic characteristics (e.g., age, gender and marital status), socio-economic (e.g., income, occupation and unemployment), circumstances (e.g., health) and personality (e.g., extraversion and neuroticism) (e.g., Cheng & Furnham, 2003; Yiengprugsawan, Somboonsook, Seubsman & Sleigh, 2012).

In systematically conducting a literature review, Lyubomirsky, Sheldon and Schkade (2005a) introduced a theoretical model in an attempt to comprehensively determine the factors which influence people's chronic happiness. According to this framework, the determinants of happiness can be largely divided into three main categories; set point, circumstances and intended activities. In this framework, set point, as refers to one's dispositional characteristics that are fixed and stable over time and across situations (e.g., extraversion and introversion traits), was found to account for 50% of variance in happiness. Circumstances, as refers to one's current situation, explains 10% of variance in happiness. Circumstances consist of both situational (e.g., illnesses and receiving a prize) and stable determinants (e.g., income, health, marital status, and job). In the model, intentional activities, as account for 40% of the variance in happiness, comprise of a wide range of activities that people seek to perform in their day-to-day lives. Such activities can be undertaken via a certain amount of effort and intention – such as routine exercises and participating in volunteer work. Intentional activities can be varied in terms of behavioural, mental and willing activities. The authors thus suggest

that happiness is a dynamic process that can be enhanced and sustained by intentional activities despite a dispositional tendency and circumstances.

Benefits of Happiness

Recently, empirical work on happiness has considerably increased. This is seen particularly strongly in the last three decades and across many fields – including in psychology, sociology, economy and gerontology (Spagnoli, Caetano & Silva, 2012). Research findings have demonstrated that happiness is not simply feeling good (e.g., I am happy or I feel happy) and instead is something more sophisticated and is viewed differently by people.

Recent researchers have begun to acknowledge that happiness is not merely an ultimate goal for people in meeting their basic needs and instead now accept that happiness has various benefits for human functioning. In a systematic meta-analysis of 225 articles as provided empirical evidence across many types of study (cross-sectional, experimental and longitudinal) from a variety of life domains (including love, health and work), Lyubomirsky, King and Diener (2005) found that happiness is correlated with diverse life facets such as marriage, social relationship and socialising. These authors also found that happiness is not only related to many positive life outcomes but that it also predicts and causes positive changes in life. Thus, there is causality between happiness and success whereby happiness may lead to various positive characteristic, resources, and successes. There can therefore be many reasons for one to be happy (Oishi, Diener & Lucas, 2007). For instance, individuals who are married are happier than those individuals who are single, divorced and widowed (Diener et al., 1999), happy people have better mental health than less happy people (Taylor & Brown, 1988) and happier

people make more money and are more satisfied with their job than unhappy people (Diener, Nickerson, Lucas & Sandvik, 2002).

According to Lyubomirsky et al. (2005b), happiness is not only correlated with successful consequences but it can also lead to successful consequences whereby there is a causal relation between happiness and positive consequences. This link between happiness and success is multi-directional whereby success results in happiness and happiness leads to success. These results suggest that happiness plays a functional role in one's functioning. In a study comparing three groups of people (unhappy, averagely happy and very happy individuals), Diener and Seligman (2002) demonstrated that very happy individuals are more satisfied in relation to their social and romantic relationships when compared to averagely happy and unhappy individuals and that, furthermore, very happy individuals spend more time socialising and less time alone than averagely happy individuals. However, unhappy individuals have substantially worse interpersonal relationships when compared to average individuals. Furthermore, happy individuals are more extraverted, more agreeable and less neurotic than less happy individuals.

Various research designs have been employed to examine the association between happiness and important life domains. These methods are predominantly cross-sectional where descriptive information as to the current characteristics of a population at a single point in time is present, longitudinal where information as to the development and changes of a population over a period of time is present and, finally, experimental where study variables are manipulated to investigate the effect of one variable on another variable. This use of different designs has allowed researchers to uncover the nested relationships between happiness and significant life domains (Kansky & Diener, 2017).

Research has shown that components of happiness are associated with the most common psychological problems encountered. In a study, Crawford and Henry (2004) found that positive affect was negatively correlated with depression, anxiety and stress while negative affect was positively related with depression, anxiety and stress. This research also indicated that lower positive affect and higher negative affect accounted for unique variance in depression. Fredrickson (2004) highlighted the importance of positive emotion on one's life, noting that the experience of positive emotions play a significant role in human functioning in terms of enhancing one's scope of attention and cognition, inhibiting persistent negative emotional arousal, facilitating psychological flexibility, developing individual resources, helping people to be optimistic as to their future and supporting better mental health. Feeling positive affect also allows people to engage with their social surroundings and to become involved in functional, healthy and adaptive activities (Fredrickson, 2001). Fredrickson and Losada (2005), in reviewing empirical evidence as to the benefits of positive affect, positive moods and positive sentiments, highlighted several benefits of those positive emotional states beyond their subjective pleasantness. Firstly, it was noted that positive affect changes the minds of individuals and widens their behavioural repertoires. Secondly, positive affect has positive effects upon the body systems of individuals. Thirdly, positive affect accounts for variance in predicting mental and physical health-related outcomes. Fourthly, positive affect explains variance in predicting longevity and the length of a person's life.

In a study in which the handwritten autobiographies of 180 Catholic nuns, as spanned from early adulthood to older age, were analysed, a significant negative relationship was found between positive emotional content in their writings and the risk of mortality. Those who wrote more positive words in their early adulthood autobiographies were more likely to live longer than those who wrote more negative

words within their early adulthood. Positive affect content in early adulthood autobiographies were thus found to positively relate to longevity (Danner, Snowdon & Friesen, 2001). In a similar manner, experimental, naturalistic and longitudinal studies investigating the contribution of happiness or subjective well-being to health and longevity have shown that high levels of subjective well-being (e.g., high positive affect, life satisfaction, optimism and low negative affect) result in better health and longevity among healthy populations (Diener & Chan, 2011). In the case of unhealthy populations, conflicting results have been obtained as to the effect of happiness on health and longevity. In other words, the assumption that the possession of higher subjective well-being accounts for the unique variance in longevity beyond the effect of negative affect is correct for healthy populations and inconsistent for clinical populations (e.g., those with cancer). It is also important to note that excessive arousal may be harmful to health (Diener & Chan, 2011). In another study, Abdel-Khalek, (2006a) found that happiness is positively correlated with physical health, mental health and religiosity – whereby mental health and religiosity explained 60% and 15% of the variance in happiness respectively.

By and large, these results suggest that happiness has many positive outcomes on people's life in relation to different important life domains. Empirical evidence has further suggests that happiness is useful as an indicator of various well-being domains – such as in relation to physical health, mental health, social relationships, work life, personal life, and marriage. Overall, the research conducted as to this area highlights the importance of happiness in achieving positive human functioning.

Negative Aspects of Happiness

Although there is a growing body of scientific evidence which demonstrates that happiness is beneficial to human functioning, recent research has begun to suggest that

happiness is not always beneficial for all individuals and that, instead, there are two aspects of happiness; functional and dysfunctional (Biswas-Diener & Wiese, 2018). To date, most studies as to happiness and its related outcome variables assume a linear relationship while non-linear relationships have been relatively neglected. However, recent studies have explored happiness and outcome variables in relation to non-linear relationship and have largely suggested that the experiencing of happiness is useful as an outcome only until a particular point, with this arising when feeling or seeking extremely intensive positive emotions (e.g., happiness). However, after this particular point has been reached, the desire for happiness can backfire (e.g., Biswas-Diener & Wiese, 2018; Mauss, Tamir, Anderson & Savino, 2011). In other words, the seeking of happiness beyond an optimal point can be detrimental.

Mauss, Tamir, Anderson and Savino (2011), in exploring this idea, focussed on identifying the paradoxical effects of positive emotions, whereupon they documented the negative aspects of valuing and pursuing happiness in some contexts. Notably, happiness has been found to be adaptive in some contexts, while being maladaptive in other situations. Furthermore, happiness has not been found to be adaptive in all degrees (Gruber, Mauss & Tamir, 2011). Moreover, Mauss et al. (2011) have demonstrated that excessive degrees of valuing happiness is correlated with lower levels of life satisfaction, hedonic balance, psychological well-being and increased depression symptoms. That is to say, individuals who highly value happiness are those who reported less subjective and psychological well-being and more mental health problems such as depression. These results suggest that valuing happiness highly may be correlated with lower happiness in cases where happiness is more likely to be achieved. Mauss et al. also showed that valuing happiness highly causes decreased levels of happiness. To put it another way, individuals who scored highly on measures in which happiness is extremely valued reported lower

happiness. Furthermore, Mauss, Savino, Anderson, Weisbuch, Tamir and Laudenslager (2012) indicated that striving to be happy might have negative outcomes upon the happiness of people. A high-level desire to be happy might make individuals lonelier, may isolate them from their social relationships and may damage their social bonds with others as wanting to be happy might make people highly focused on themselves and less focused on others. That is, individuals who excessively value happiness characteristics might have less of an ability to feel empathy and sympathise with others as such people tend to find ways of maximising their happiness without taking the needs of others into account. This has the potential to invoke negative effects among those individuals in regards to experiencing greater feelings of loneliness and lower levels of subjective, psychological and social well-being. These findings suggest that the pursuit of and valuing highly of happiness may be related to negative psychological variables and may cause maladaptive consequences by invoking negative effects upon one's well-being.

Another happiness-related argument, in which happiness is considered to be maladaptive, has been proposed by Joshanloo. According to Joshanloo (2013a), some people are afraid to be happy for various reasons – potentially due to their belief that being happy or expressing happiness leads to bad consequences. In a similar way, some people are averse to attaining an immense degree of happiness, as they believe that if they are highly happy, it is likely that they would lose the sense of control over themselves (Holden, 2009). Accordingly, such people are likely to suppress their authentic happiness to prevent associated negative outcomes (Joshanloo, 2014).

In summary, this recent research collectively suggests that there are various happiness-related arguments (e.g. valuing happiness and fear of happiness) where happiness is not the default position for human functioning and that there are detrimental effects of valuing and pursuing happiness in addition to happiness sometimes being

avoided. These studies collectively suggest that valuing happiness and fear of happiness are negatively related with subjective and psychological well-being and positively related with depressive symptoms.

Models of Happiness

Different measurement models have been proposed in regards to subjective well-being and psychological well-being. Happiness measures are commonly constructed within the two main conceptual models of unidimensional and multidimensional. A unidimensional model of happiness represents an underlying general factor of happiness where, to assess one's level of happiness, a total score summing each item on a scale is computed. Here, higher scores generally indicate a higher level of happiness. A multidimensional model of happiness typically includes more than one component in providing information across different domains of happiness. To assess one's level of happiness from a multidimensional perspective, items from respective components are summed to create an overall score for each component. From this, detailed information can be obtained in regards to one's happiness level.

Measurement of Happiness

Measurement usually refers to the way in which data is collected (Kansky & Diener, 2017). Happiness is typically measured via self-report measures, peer reports and physiological measures. Self-report measures, whereupon individuals are asked to report their own level of happiness, can be either a single item measurement as to overall happiness or a set of items measuring different components of happiness. As happiness is defined in several ways, measurements are generally developed to refer to different definitions of happiness. A variety of self-report assessments already exists to assess different components of happiness or well-being. Within the extant literature, it can be

seen that measurements are mainly designed for two purposes. The first purpose pertains to when measurements are developed to assess different components of happiness or subjective well-being – for example, the Positive and Negative Affect Scale (PANAS) of Watson et al. (1988) which assesses positive and negative affect, the Satisfaction with Life Scale of Diener et al. (1985a) which measures cognitive evaluation of subjective well-being and the Subjective Happiness Scale of Lyubomirsky & Lepper (1999) which measures global subjective happiness. The second purpose pertains to assessing psychological well-being – such as Ryff's (1989) Psychological Well-Being Scale (PWBS). In addition to these scales, single items scales have also been developed to measure happiness. Here, Bradburn's (1969) Global Happiness Item and Abdel-Khalek's (2006b) Single Item Happiness Scale can be given as examples. Notably, all of the above-mentioned assessments aim to measure the functional aspects of happiness.

However, as happiness research continued to develop over the past decade, and with new conceptualisations of happiness that refer to the dysfunctional aspects of happiness (e.g., valuing happiness) emerging, several new self-report happiness measures have been introduced. In considering the phenomenon that happiness may not be good at all times and in all contexts, the Valuing Happiness Scale (Mauss et al., 2011) and the Fear of Happiness Scale (Joshanloo, 2013a) are two recently designed scales used to measure the degree to which people value happiness and the degree to which people averse to happiness, respectively.

Although self-report measures have been widely used to measure happiness within the extant literature, they are subject to various types of bias. For example, according to Malkoç and Yalçin (2015), the application of self-report measures in a study might produce a methodological issue in terms of invoking social desirability bias and self-deception. Here, individuals may answer questions in favour of others and

overestimate or underestimate responses. Robins, Fraley and Krueger (2007) have also highlighted that self-report measures may carry biases including impression management (exaggeration, faking and lying) and self-deception (self-favouring bias, self-enhancement, defensiveness and denial).

In addition to self-report measures, researchers have also used peer reports to assess individual differences in relation to psychological constructs (e.g., happiness). This method relies upon information obtained from one's surroundings (e.g., friends, family, romantic partners and experts). Since such data is obtained from multiple sources, the method can be considered to be more reliable than self-report measures (Martel, Markon & Smith, 2016). This method can be very beneficial in providing invaluable information in cases where self-report and physiological measures are not present or are ineffective. Despite the fact that the obtaining of data from different sources provides detailed information about psychological constructs (e.g., happiness) as opposed to self-reporting, the collecting of data from other people may be time-consuming, expensive, impractical and inefficient (Martel et al., 2016).

Due to the aforementioned problems with self-report measures and other informant reports, researchers have proposed alternative approaches through which to study happiness in order to reduce participant and peer-related bias. Objective measures have thus been advanced in order to increase the reliability and validity of gained findings. Physiological measures is one such approach recently employed in examining the association between happiness and significant life outcomes. Some physiological assessment consists of the continuous monitoring of heart rate, respiration rate, galvanic skin responses (GSR), blood pressure, electrocardiography (ECG) and electroencephalography (EEG). In physiological measures, individuals are monitored in real time by a series of physiological sensors, some of which must be placed directly upon

the individual's body (e.g., EEG, ECG and GSR), while others do not necessarily need to be attached (e.g., eye tracking devices embedded in the physical system) (Tran et al., 2007).

Although the application of physiological measures in happiness research is still in its infancy, the use of such techniques allows researchers to understand individual differences in levels of happiness or in the responses given to unpleasant stimuli that implicitly or explicitly affects happiness levels (e.g., Rutledge, Skandali, Dayan & Dolan, 2014; Urry et al., 2016). Through physiological measures, "real time" physiological changes in one's body (e.g., cardiovascular changes or brain activity) can be tracked. In contrast to self-report measures, physiological measures provide more objective and reliable information (Tran et al., 2007). Although physiological measures are not subject to some of the inherent biases of self-report measures, some disadvantages nevertheless arise – including in relation to the restriction of body movements, a lack of comfort and the interference of bodily fluids (e.g., sweat) with measuring devices (Ikehara & Crosby, 2005).

Ellis's Rational Emotive Behavioural Theory

In 1955, Albert Ellis proposed Rational Emotive Behaviour Theory (REBT) within the field of Psychology. REBT, as one of the first and best-known cognitive, behavioural and emotion theories (Ellis, 1957a), was characterised by Ellis as an action-oriented psychotherapy that aims to initially identify and then dispute self-defeating (unhealthy) thoughts, emotions and behaviours by replacing them with healthier ones in an attempt to promote positive functioning and well-being among clients. This theory focuses on teaching clients to undertake responsibility for their own thoughts, emotions and actions in order to allow them to cope with destructive beliefs, feelings and actions.

REBT is grounded in the idea that people are not disturbed by events *per se*, but rather that their interpretations are associated with the events (Ellis, 1994). Ellis believed that one's way of thinking (cognition), way of feeling (emotion), and way of acting (behaviour) dynamically communicate with each other. Such thoughts can result in either dysfunctional emotions and maladaptive behaviours or functional emotions and adaptive behaviours.

ABCDE Model in REBT

REBT, in its various aspects, is extensively applied in clinical and counselling settings. The ABCDE Model is the fundamental aspect of REBT, as it seeks to resolve the link between stimuli and responses. Ellis (1973, 1985, 1994) formulated the ABCDE Model to uncover the interaction between cognitions, emotions and behaviours, noting that, within this framework, beliefs are the primary mediators and causal factors of a wide range of emotional, behavioural and cognitive responses. In this framework, "A" stands for an activating event that interferes in an individual's life, "B" stands for the beliefs corresponding to that event while "C" stands for the consequences produced as a result of the beliefs. Activating events can be anything derived from either internal or external sources which stimulate responses. Once an event is activated at point "A", an individual may experience various cognitive, emotional and behavioural consequences at point "C". Depending on the individual's beliefs at point "B" as to the activating event, the emerging consequences can be either functional, healthy, and adaptive or, alternatively, dysfunctional, unhealthy, and maladaptive. The ABC framework suggests that the genuine factor in determining whether individuals experience functional versus dysfunctional, healthy versus unhealthy and adaptive versus maladaptive outcomes can be attributed to their irrational and rational beliefs pertaining to the activating event. It

therefore appears that “C” is not a direct result of “A”, but rather a result of “B”. That is, “B” plays a mediator role in the relationship between “A” and “C”.

Since its initial proposal, the theory has evolved. In the 1990s, Ellis (1991) expanded the ABC model by adding two new elements, D and E, to demonstrate how positive changes in behaviour can be made by replacing dysfunctional beliefs with more functional beliefs. An illustration of the ABCDE Model is presented in Figure 1. In the new model of ABCDE, “D” represents the disputing of irrational beliefs and “E” represents effective new, productive and useful beliefs. In this framework, clients are encouraged to challenge particular irrational beliefs by first disputing them and then acquiring rational beliefs to substitute the irrational beliefs.

In considering the assumptions of the ABCDE Model, it appears that the application of the ABCDE Model in relation to happiness is useful not only in identifying irrational happiness beliefs but also in disputing these and subsequently acquiring rational happiness beliefs. This would be particularly useful in clinical and counselling settings in regards to the treatment of and prevention from irrational happiness beliefs as well as the promotion of rational happiness beliefs in an attempt to increase flourishing states of mental well-being that indicate a true achievement of well-being.

Rational Beliefs Versus Irrational Beliefs

One of the fundamental principles of REBT is that rational and irrational beliefs affect subsequent psychological events. REBT gives wide coverage to rational and irrational beliefs, whereby irrational beliefs are characterised as unhelpful, illogical, unrealistic, absolutistic and dogmatic and as leading to dysfunctional emotions, feelings and moods and maladaptive behaviours.

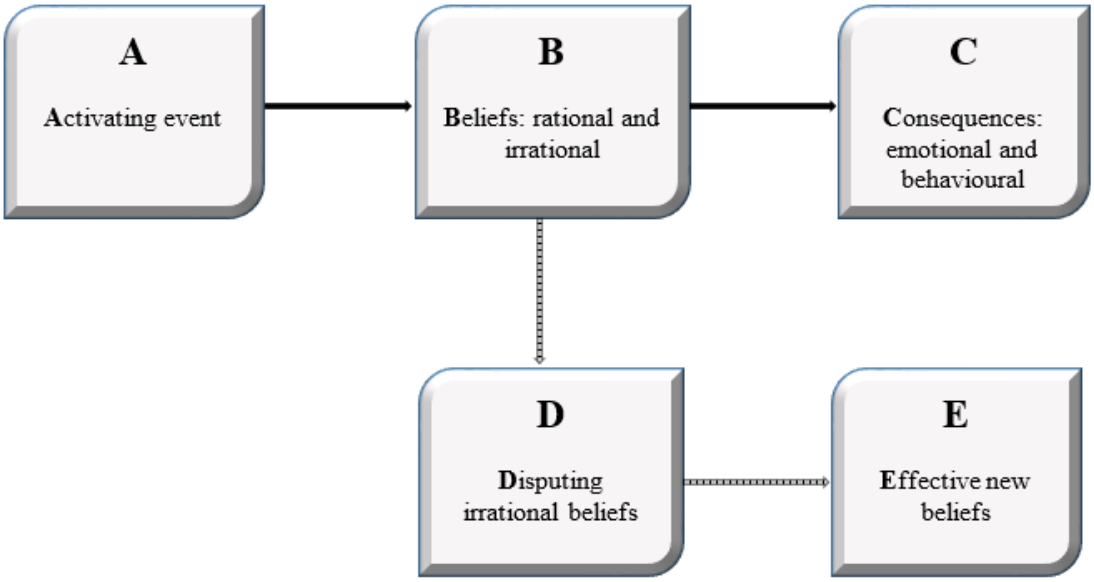

Figure 1. Schematic Representation of REBT Showing How Emotional and Behavioural Responses Occur

In contrast, rational beliefs are characterised as helpful, logical, realistic, preference and pragmatic and as leading to functional emotions, feelings and moods and adaptive behaviours (Ellis, 1962, 1994). According to REBT, irrational beliefs are grounded in demands, awfulizing, low frustration tolerance and conditional self, other people and life acceptance. In contrast, rational beliefs are based on preferences, non- awfulizing, high frustration tolerance and unconditional self, other people and life acceptance. Indeed, the nature of beliefs ensure that they are either rational or irrational. If beliefs predominantly rest on the preferential (e.g., ‘‘I want to perform well and be approved by significant others, but if I perform badly and am disapproved, I can still usually survive and have some happiness’’), this refers to rational beliefs. However, if beliefs predominantly rest on demandingness and/or the absolutistic (e.g., “I absolutely have to perform well and win others” or “Other significant people in my life must treat me kindly and fairly at all times, or else I can’t stand it…”), this refers to irrational belief (Ellis, 1994). The REBT

maintains that individuals excessively tend to disturb themselves with absolutistic thinking yet they are capable of replacing such thinking with preferences (as are typically healthy and productive) rather than statements that include should, must and ought to (as are typically unhealthy and destructives and cause disturbance) (David, Lynn & Ellis, 2010).

Must-urbatory in REBT

According to Ellis (2003), people have an intense predisposition to think and perceive irrationally by possessing excessive demands on themselves, others and the world. Indeed, Horney (1950) introduced the idea of the tyranny of the "should" and Ellis (1955) adopted the idea of demandingness that it incorporates into his concept of irrational thinking. Human disturbance thus stems from all variations of those three fundamental irrationals beliefs. Irrational beliefs include demands comprising rigid and absolute statements with words of "should", "must" and "ought". An example of such beliefs is "Everyone should love and approve of me, if they don't, I feel awful and unlovable." Beliefs that rest on demands, awfulizing, low frustration tolerance and damnation are also expressed with words such as "I can't stand it", "It's awful", "They are horrible" and "They are terrible", with this leading to emotional disturbance (e.g., anxiety, anger and depression) and maladaptive behavioural consequences (Ellis, 2004; 1991; 1987). The holding of such forms of irrational beliefs is thus at the core of emotional disturbance. Irrational beliefs can be disputed with the alternative form of rational beliefs, as are grounded in preferential statements such as "Even though I fail, I am still a good person" or "I would like things to go my way, but they don't have to." Having such beliefs can result in more helpful emotions and behaviours.

To summarise, this section has reviewed theoretical and empirical evidence as to happiness. Typically, there are both positive and negative sides of happiness. Research as to the positive side of happiness has predominantly demonstrated that happiness is good for positive functioning. However, research as to the negative side of happiness has shown that happiness is not good for one's well-being at all times, in all degrees and in relation to all types. In this section, we have also reviewed some of the fundamental principles of REBT, giving particular focus to rational versus irrational beliefs, the ABCDE Model, and the musturbatory system, with this having been shown to provide the theoretical underpinning of irrational happiness beliefs. In the following section, the concept of irrational happiness beliefs will be presented.

Introducing the Irrational Happiness Beliefs Construct

This section presents an overview of the conceptualisations and definitions of irrational happiness beliefs as derived from REBT. The aim of this chapter is to highlight the gaps that need to be filled to comprehensive account as to the nature of irrational happiness beliefs. This section also presents an outline for this thesis.

REBT extensively emphasises the role of rational and irrational beliefs in human disturbance. Consequently, the theory distinguishes itself from other cognitive-behavioural theories by placing a central focus on the beliefs system and its relationship with emotions and behaviours. Within this context, REBT can provide an important theoretical foundation through which to focus more explicitly and meaningfully on the dynamic process of happiness beyond traditional views of happiness. In particular, the application of REBT principles – particularly the absolutistic evaluations of the specific words of *should, ought* and *must* – upon the understanding of happiness is able to provide an important context to understanding the relatively different aspects of happiness and its

relation with well-being and different domains of psychology. Hence, to fully understand the dynamic process of happiness, we believe that our understanding of happiness and its measurement must be reformulated beyond different views of happiness (e.g., valuing happiness and the fear of happiness constructs) to get at the heart of the maladaptive aspects of happiness. Here, we therefore introduce the *irrational happiness beliefs* construct.

The conceptualisation of irrational happiness beliefs has been derived from the literature on irrational and rational beliefs (e.g., Ellis, 1962, 1994). The relevance of this theoretical framework rests on the relationship between irrational and rational thinking and emotional disturbance. As above-mentioned, literature as to irrational and rational beliefs has asserted a basic idea that it is not so much events that directly cause emotional and behavioural reactivity but rather that it is one's beliefs about such events that cause cognitive, emotive and behaviour reactivity (Ellis, 1957b). The application of this idea upon happiness can contribute to understand the link between irrational beliefs explicitly related to happiness and their relationship with cognitive, emotional and behavioural disturbances.

Irrational happiness beliefs can be considered to be potentially maladaptive and a conditional aspect of happiness whereupon individuals place excessive standards on themselves to attain happiness. The core idea of irrational happiness beliefs pertains to the notion that placing happiness to an absolute level by using concepts such as *should, ought and must* as part of one's thinking can be detrimental for human well-being. Irrational happiness beliefs is a concept in which these are largely acceptable beliefs that are expressed by individuals yet, due to their unattainable nature, they are un-achievable. Irrational happiness beliefs rest on a conditional aspect of happiness that happiness *should, ought and must* be attained. Happiness beliefs, as concentrate on *should, ought*

and must attainment, tend to cause disturbance among people when these things do not always occur. In this context, statements such as "I must always be happy in all aspects of my life" are possible irrational happiness beliefs that may lead to emotional disturbance.

There is reason to extend happiness beyond the dysfunctional happiness measure by looking at irrational happiness beliefs. The reason for this is that, in our proposal, happiness deals with the *absolute* if we look at the psychology literature and grounds on which a strong empirically-supported REBT emphasises how absolute thinking can cause emotional disturbance. This could therefore be a theoretical focus for future work on dysfunctional happiness. Going beyond the default position of happiness where happiness is typically considered as adaptive for human functioning, and by providing evidence as to the negative of happiness particularly in regards to the absolutistic aspect of happiness, a comprehensive understanding as to the effect of happiness on human functioning can emerge.

Thesis Outline

The central focus of Chapter One has been to provide a literature review as to the definition of happiness, the positive and negative aspects of happiness, measurements of happiness and REBT. After reviewing this literature, a need for the reformulation of the dysfunctional aspect of happiness has been identified. This chapter has also introduced a new psychological construct, irrational happiness beliefs, in order to fill an important gap in the happiness literature. The need for this construct has also been emphasised, whereby it has been detailed how this new construct has meaningful theoretical, empirical and practical implications in terms of reformulating our understanding of happiness and its measurement. In this regard, it has been shown that exploring irrational happiness beliefs

can extend the discussion beyond the currently held views about happiness and allow a consideration of the maladaptive aspects of happiness. Once a new construct is introduced, it is important to operationalise that construct to measure it with a reliable and valid instrument. Subsequently, it is also worthwhile establishing its link with theoretically-relevant constructs.

The current thesis therefore aims to develop a measure of irrational happiness beliefs and to examine its importance to wider psychology. The aims of the present thesis are thus as follows: (1) to use psychometric theories to develop an irrational happiness beliefs measure using the survey method and, (2) to examine the relevance of irrational happiness beliefs with well-being, coping strategies, personality and physiological arousal. With regards to the first aim, we initially sought to develop a new scale, the Irrational Happiness Beliefs Scale (IHBS), to capture the idea that conditioning happiness to an absolute level may be dysfunctional for mental health. In line with this purpose, we produced preliminary reliability and validity studies of the IHBS, as are detailed throughout Chapter Two and Chapter Three.

In Chapter Two, we reported two studies which sought to establish the internal consistency reliability and validity of the scale. The first study particularly aimed at uncovering the underlying factor structure of the IHBS via exploratory factor analysis alongside providing evidence of the convergent and divergent validity through correlation analysis with theoretically-relevant constructs. In that study, the internal consistency reliability of the scale was also reported using Cronbach's alpha coefficient. Using confirmatory factor analysis, the second study gave specific focus to proving or disproving the emerging factor structure of IHBS through exploratory factor analysis. Chapter Three presents two studies. In those studies, the structure of irrational happiness beliefs was tested against valuing happiness, as perhaps shares some theoretical variation

with irrational happiness beliefs. In Study 1, the factor structure of irrational happiness beliefs was compared with the factor structure of valuing happiness with confirmatory factor analysis using a UK sample. In Study 2, the possible resulting factor structure of irrational happiness beliefs and valuing happiness were explored as to whether this could be verified with confirmatory factor analysis using a USA sample.

As for the second aim, the focus was given to understanding the process of irrational happiness beliefs within wider psychology and to transferring this to emotional regulation within an experimental context. Studies relating to the second aim are reported in Chapter Four, Chapter Five and Chapter Six. In Chapter Four, one study is presented that sought; (a) to explore the value of irrational happiness beliefs by considering its contribution to subjective well-being over time and, (b) to determine the test-retest reliability of the irrational happiness beliefs measure. In Chapter Five, one study is presented that was designed to examine irrational happiness beliefs within an adaptational-continuum model of personality and coping. In Chapter Six, one experimental study using the Cold Pressor Task is presented in an attempt to understand the position of irrational happiness beliefs within the context of emotional regulation. Finally, in Chapter Seven, we discuss the findings of the current thesis and their theoretical and practical implication for the research and practice undertaken in this area. The limitations of the thesis are also detailed here.

Chapter Two

Irrational Happiness Beliefs Scale: Preliminary Reliability and Validity Studies

Abstract

This study sought to develop a new measure of irrational happiness beliefs (IHB) and test its reliability and validity across two United Kingdom samples. The participants were subjected to a series of happiness, rationality, irrationality, subjective and psychological well-being measures. The exploratory (n = 207) and confirmatory factor analyses (n = 157) undertaken suggested that the IHB measure was unidimensional with three items. Furthermore, the internal consistency statistic demonstrated a good reliability. Supporting its construct validity, the IHB displayed convergent validity with expected significant positive correlations with measures of Valuing Happiness, Negative Affect, Perceived Stress and Irrational Thinking. As expected, the scale was also found to be negatively correlated with measures of Satisfaction with Life, Subjective Happiness, Positive Affect, Psychological Well-Being and Rational Thinking. Additionally, the IHB scale was found to be discriminated from the valuing happiness measure. The results thus suggest that the IHB is a valid and reliable measure that can be used to assess people's irrational happiness beliefs.

Introduction

With the advent of the Positive Psychology discipline (Seligman & Csikszentmihalyi, 2000), a growing interest has been given to exploring the positive aspects of human functioning as opposed to conventional psychology disciplines (e.g., clinical psychology) – the latter witnessing interest being predominantly given to minimising dysfunctional states of stress, anxiety and depression for example.

Studies in the field of positive psychology have increasingly focused on the conceptualisation and measurement of positive psychological constructs – such as happiness and life satisfaction (e.g., Lyubomirsky & Lepper, 1999; Diener, Emmons, Larsen & Griffin, 1985). By giving specific attention to happiness, reviewing the relevant happiness literature reveals that most of the existing measures of happiness seek to assess happiness either at the global level or in relation to a specific level of happiness or subjective well-being. Considering that happiness includes both affective and cognitive elements (Diener *et al*., 1999), various happiness measures have been developed to facilitate a better understanding of its positive functioning – for example, in relation to happiness and life satisfaction – in related studies. For example, the Positive and Negative Affect Scale (PANAS: Watson, Clark & Tellegen, 1988), the Satisfaction with Life Scale (SWLS: Diener *et al*., 1985), the Subjective Happiness Scale (SHS: Lyubomirsky & Lepper, 1999), the Psychological Well-Being Scale (PWB: Ryff, 1989, 1995; Ryff & Keyes, 1995) and the Warwick-Edinburgh Mental Well-Being Scale (WEMWBS: Tennant *et al*., 2007) have been commonly used as happiness and well-being instruments and to mainly measure adaptive characteristics of happiness and well-being. These instruments can be very useful in clinical practice in the assessment of the effectiveness of happiness-related interventions and in research designed to extend existing findings in an effort to understand happiness in depth.

On the other hand, most recent research has approached happiness from different perspectives and has conceptualised and measured happiness via a grounding in the maladaptive aspect of happiness where valuing happiness or the fear of happiness is addressed as being detrimental for subjective and psychological well-being. Within this context, the Valuing Happiness Scale (Mauss *et al*., 2011) and the Fear of Happiness Scale (Joshanloo, 2013a) have been developed to measure the degree to which people value happiness and the degree to which people are averse to happiness, respectively. These measures are beneficial in terms of broadening our understanding of happiness beyond the default position of happiness in both clinical practice and research.

As the central focus of the present study is given to looking at the maladaptive aspect of happiness, special attention has been given to examining the nature of the Valuing Happiness Scale that, theoretically, appears similar to the Irrational Happiness Beliefs Scale. However, a careful examination of the valuing happiness construct and scale reveals that the scale does not fully reflect our proposal of happiness for two reasons. Firstly, the valuing happiness construct derives its theoretical context from goal-orientated behaviour around values in which negative outcomes (e.g. disappointment) can emerge from the relationship between valuing something highly and then the standards by which the individual judges their achievements in terms of those values (Carver & Scheier, 1981; Mauss *et al*., 2011). However, the theoretical foundations of the irrational happiness beliefs construct are situated within REBT. Secondly, although the language used within the Valuing Happiness Scale refers to an extreme level of happiness (e.g., "Feeling happy is extremely important to me" and "I need to feel happy most of the time"), the scale is limited in capturing happiness as an absolute. Contrary to this, we address happiness as an *absolute* by using specific words of *"should", "must" and "ought"*. This is an important distinction between valuing happiness and irrational

happiness beliefs as when happiness is highly valued, this does not mean that happiness is always important (e.g., it is important for me to happy). However, happiness as an absolute (e.g., I must always be happy in all aspect of my life) is one-step further than valuing happiness. It shows the highest level of an ultimate goal.

Considering the above-mentioned findings, irrational happiness beliefs seem to be a neglected construct in psychology. However, there are reasons why irrational happiness beliefs may be worth exploring. Recent cross-sectional and empirical research as to the downside of happiness has indicated that valuing happiness to an extreme degree can be detrimental to one's level of subjective and psychological well-being (Mauss *et al*., 2011). Although the results of those studies need to be confirmed over time and across cultures, some theoretical and empirical indications suggest avenues in which irrational happiness beliefs may be an important construct to both subjective, psychological, emotional and social well-being.

To address this neglected avenue in regards to the aspects of happiness, a robust tool that measures irrational happiness beliefs is necessary. Development of this tool should be based on a strong theory that provides a theoretical underpinning of what irrational happiness beliefs comprise of. In light of REBT, we believe that there may be several characteristics of people with irrational happiness beliefs. Firstly, people with irrational happiness beliefs might make conditional happiness standards that appear hard to reach. Consequently, failure to achieve those standards may lead to emotional disturbance as people do not find routes to happiness all of the time. Secondly, people with irrational happiness beliefs may tend to seek pleasure through which to maximise their happiness and distance themselves from pain to avoid negative consequences of life events. Thirdly, people with irrational happiness beliefs may largely focus on their happiness rather than making contributions to the happiness and well-being of others.

Fourthly, people with irrational happiness beliefs can be characterised as holding inflexible and rigid happiness-related thoughts. With this in mind, we have endeavoured to develop an irrational happiness beliefs measure that reflects those characteristics. A measure of irrational happiness beliefs, as reflects the conditional aspect of happiness, is both timely and necessary for the development of research in this area. To this end, we used the words *"should", "must" and "ought"* as are directly derived from REBT (Ellis, 2004; 1991; 1987; 1957). We hypothesised that holding and expressing irrational happiness beliefs may be negatively associated with one's subjective and psychological well-being. It is thus further held that those who hold and experience irrational happiness beliefs may be more likely to experience emotional disturbance.

Present Study

In the present study, we presented a measure explicitly derived from REBT, as it is designed to capture the conditional aspect of happiness. Accordingly, we here report two studies that present the construction of the irrational happiness beliefs measure and show its construct validity as well as the indications found as to the relationships between theoretically similar and dissimilar psychological constructs. In Study 1, we present the initial construction of the irrational happiness beliefs measure by specifically focusing on; (a) internal consistency reliability, (b) underlying factor structure by means of exploratory factor analysis and (c) convergent and discriminant validity. This was achieved by exploring correlations with similar and dissimilar theoretical constructs. In regards to the above aims, we first sought to provide evidence as to the internal consistency reliability of the measure, undertaken in order to show that the items on the scale are coherent. The expectation was the obtaining of a high internal consistency reliability. Secondly, we hypothesised that exploration as to the underlying theoretical structure would yield a one-factor solution. Thirdly, as the proposed scale is a happiness

scale, establishment of the convergent validity of the scale with other happiness measures is useful. Here, we expected that the irrational happiness beliefs measure would correlate negatively with happiness measures aimed at assessing adaptive aspects of happiness (e.g., the Satisfaction With Life Scale), and would correlate positively with other happiness measures aimed at assessing maladaptive aspects of happiness (e.g., Valuing Happiness Scale). We also expected to establish the discriminant validity of irrational happiness beliefs against valuing happiness. Assuming that valuing happiness is a theoretically different construct, we sought to find that the scores for the irrational happiness beliefs measure are not substantially affected by the scores for the valuing happiness measure. In Study 2, in using confirmatory factor analysis we attempted to confirm the underlying factor structure of the scale using a different sample. Here, we hypothesised that the resulting factor structure through exploratory factor analysis would be invariant in the selected sample.

Method

Participants

Two samples were used in this study. The first sample was employed for exploratory factor analysis, internal consistency, convergent and discriminant validity. The second sample was used for confirmatory factor analysis. Participants in Sample 1 consisted of 207 students who were completing Psychology degrees at the University of Leicester in the United Kingdom and, furthermore, who were taking part in the School Experimental Participation Scheme. The sample included 26 males (13%) and 181 females (87%) whose ages ranged from 18 to 46 years old (M= 19.9; SD= 2.9). One of the respondents declined to give information about her age. Sample 2 consisted of 157 (134 female, 23 male) students studying at the University of Leicester whose ages ranged

between 18 and 35 years (M=19.5, SD= 2.3). Three participants did not declare their age. For both samples, the participants completed a series of online surveys and received course credits for their involvement.

Measures

Participants in Sample 1 completed the following measures. Participants in Sample 2 only completed the Irrational Happiness Beliefs Scale and a set of subjective well-being measures over Time 1 and Time 2. Only the responses of the irrational happiness beliefs measure at Time 1 were analysed here to perform confirmatory factor analysis.

Irrational Happiness Beliefs Scale (IBHS). To develop the irrational happiness beliefs measure to be used in the present study, three items that include the words *"must", "should" and "ought to"* were created. Each of the three items in the IHBS are rated on a seven-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Examples of items include "I must always be happy in all aspects of my life" and "I should always be happy in all aspects of my life". There is no reverse item on the scale. The scale score is the sum of the items on the scale. Higher scores on the scale show a greater degree of irrational happiness beliefs while lower scores present a lesser degree of irrational happiness beliefs.

Valuing Happiness Scale (VHS; Mauss *et al*., 2011). The VHS scale is a 7-item self-reported scale constructed to assess valuing happiness to an extreme degree. The scale was presented as a unidimensional scale. The items are rated from 1 (*strongly disagree*) to 7 (*strongly agree*). Examples of items include "Feeling happy is extremely important to me" and "If I don't feel happy, maybe there is something wrong with me". The scale score is the sum of the items on the scale. Higher scores on the scale indicate a

higher level of valuing happiness. In this study, the internal consistency for the VHS was .86.

Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen & Griffin, 1985). The SWLS is a 5-item self-report scale developed to measure the concept of life satisfaction by assessing one's overall judgement of his or her life. The scale was presented as unidimensional. The items are rated from 1 (*strongly disagree*) to 7 (*strongly agree*). Examples of items include "In most ways my life is close to my ideal" and "I am satisfied with my life". The scale score is the sum of the items on the scale. Higher scores on the scale indicate higher global life satisfaction. In this study, the internal consistency for the SWLS was .90.

Subjective Happiness Scale (SHS; Lyubomirsky & Lepper, 1999). The SHS is a 4-item self-report scale designed to measure subjective happiness in an attempt to explore the extent to which a person is happy or unhappy in general. The scale is unidimensional. The items are rated from 1 to 7, but the ratings are different for each of the items. For example, the items "In general, I consider myself..." and "Compared with most of my peers, I consider myself…" are respectively rated from 1 (*not a very happy person*) to 7 (*a very happy person*), and from 1 (*less happy*) to 7 (*more happy*). The scale score is the sum of the items on the scale with reverse coding of the relevant items. Higher scores indicate a higher level of global subjective happiness. In this study, the internal consistency for the SHS was .91.

Positive and Negative Affect Scales (PANAS; Watson *et al*., 1988). The PANAS is a 20-item self-report scale developed to measure the affective components of happiness. The scale is presented as two factors; Positive Affect (PA) and Negative Affect (PA). The items are rated from 1 (*very slightly or not at all*) to 5 (*extremely*). Some

items are “enthusiastic”, “attentive”, “distress” and “nervous”. The scale scores are the sum of the items on the respective sub scale. Higher scores as to PA indicate a higher level of experiencing positive affect while higher scores as to NA indicate a higher level of experiencing negative affect. In this study, the internal consistency of the PA and NA were .63 and .63 respectively.

Scales of Psychological Well-Being (SPWB; Ryff, 1989). The SPWB is a 54-item self-report scale developed to assess six dimensions of human functioning. These dimensions are Autonomy, Environmental Mastery, Personal Growth, Positive Relations with Others, Purpose in Life and Self-Acceptance. The items are rated from 1 (*strongly disagree*) to 6 (*strongly agree*). Examples of items include “In general, I feel I am in charge of the situation in which I live” and “I like most aspects of my personality”. The scale score is the sum of the items on the respective subscale with reverse coding of the relevant items. Higher scores indicate a higher level of positive functioning. For the purpose of this study, although there are other versions of the scale (e.g., 18-item, 42-item), we used the 54-item version due to its superiority in terms of it being highly suggested and it retaining a wealth of information in contrast to shorter versions. We created a total score for the analysis. In this study, the internal consistency for the SPWB was .96.

Shortened General Attitude and Belief Scale (SGABS*;* Lindner *et al*., 1999). The SGABS is a 26-item scale developed to measure rational and irrational beliefs by excluding items reflecting behavioural and emotional outcomes. The scale includes one rationality (4 items) subscale and six irrationality subscales, demand for fairness (4 items), need for approval (3 items), need for achievement (4 items), need for comfort (4 items), self-downing (4 items) and other downing (3 items). A total irrational scale can be calculated by summing the six irrationality subscales (22-items). The items are rated

from 1 (*strongly disagree*) to 5 (*strongly agree*). Examples of items include "It is awful and terrible to be treated unfairly by people in my life" and "I have worth as a person even if I do not perform well at tasks that are important to me". Higher scores as to the rationality subscale indicate a higher level of rational beliefs while higher scores as to the irrationality subscales indicate a higher level of irrational beliefs. For the purpose of this study, a total score was created for the irrational subscales. In this study, the internal consistency for rationality and irrationality were .67 and .89 respectively

Perceived Stress Scale-10 (PSS; Cohen, S. & Williamson, G., 1988; S. Cohen, Kamarck & Mermelstein, 1983). The PSS scale is a 10-item scale developed to assess the extent to which situations in one's life are perceived as stressful. The scale was presented as unidimensional. The items are rated from 0 (*never*) to 4 (*very often*). Examples of items include "In the last month, how often have you been upset because of something that happened unexpectedly?" and "In the last month, how often have you felt that you were unable to control the important things in your life?". The scale score is the sum of the items on the scale with reverse coding of the relevant items. Here, higher scores indicate a higher perception of stress. In this study, the internal consistency for the PSS was .77.

Procedure

Along with demographic questions (e.g., age and gender), the questionnaires were placed in the Experimental Participation Requirement system (EPR), as is a web-based program provided by the University of Leicester's School of Psychology. This system was easy to access for students. Students were required to sign-up for the software in order to participate in the research and, in return, they received course credits. The study gained ethical approval from the University of Leicester Ethics Board. Prior to the administration of the questionnaire package, participants were provided with a consent

form via the first page of the online survey. The consent form included information as to the purpose of the study, the anonymity provisions of the data, their ability to withdraw at any point from the study and the confidentiality and secureness of the data. Only those who explicitly agreed to participate in the research and who were above 18 years old were allowed to take part in this study. Those who did not meet these criteria were not allowed to proceed with the study. All of the participants completed the questionnaires in the same order.

Data Analysis

We began by computing the descriptive statistics for the study variables. The skewness and kurtosis statistics were used to check the univariate normality. Kaiser-Meyer-Olkin (KMO) and Bartlett's sphericity test were conducted to make a decision as to the sample adequacy for the exploratory factor analysis. Exploratory factor analysis was employed using the Maximum Likelihood extraction method to examine the underlying structure of the Irrational Happiness Beliefs Scale. The Pearson Product Moment correlation coefficient was calculated for the convergent and discriminant validity of the scale. Cronbach's alpha coefficient was computed for the reliability statistic. All analyses were performed using SPSS Version 24.

Results

Preliminary Analysis

Prior to the main analysis, we explored the descriptive statistics for the suitability of the data for the purpose of analysis. Table 1 presents the minimums, maximums, means, standard deviations, skewness and kurtosis statistics for each of the variables used in the current study. As shown in Table 1, detection of the skewness and kurtosis values for each of the variables fell within the recommended range of -1 to +1 (Tabachnick &

Fidell, 2001). Thus, the deviation from normality is not a serious problem, with this suggesting that parametric tests were appropriate for the data analysis.

Internal Consistency Reliability

Establishment of reliability is important for the credibility of a scale. As a consequence, we assessed the internal consistency reliability for the items on the Irrational Happiness Beliefs Scale using Cronbach's alpha coefficient. The Cronbach's alpha coefficient was found to be .84, with this suggesting that the items had a high internal consistency by exceeding Cronbach's alpha coefficient criterion of $\alpha > .7$ as good.

Exploratory Factor Analysis

According to MacCallum, Widaman, Zhang & Hong (1999), a sample size between 100 and 200 is sufficient for the factor analysis when communalities are greater than .5 after extraction. Based on this criterion, the sample size of the present study (n = 207) was adequate for the factor analysis. Kaiser-Meyer-Olkin (KMO) (Kaiser, 1974) and Bartlett's test of sphericity were conducted to explore if the data was appropriate for factor analysis. The measure of sample adequacy for the KMO value is recommended to be greater than 0.60 and Bartlett's test of sphericity should also be statistically significant. The KMO sample adequacy was found to be 0.71 and Bartlett's test of sphericity indicated that correlations existed in the data set $\chi 2\ (3) = 266.497$, $df = 3$, $p < .001$. These results demonstrated that factor analysis was appropriate for the sample.

Exploratory factor analysis (EFA) was performed in order to determine the underlying factor structure of the scale using the Maximum Likelihood Estimation (ML) method without any rotation. The ML method was used as it produces significant tests for each item and confidence intervals alongside a broad range of indices of the goodness of fit model (Fabrigar, Wegener, MacCallum & Strahan, 1999).

Table 1. Descriptive Statistics including skewness and kurtosis

	Min	Max	Mean	*SD*	Skewness		Kurtosis	
					Statistic	*SE*	Statistic	*SE*
1.IHBS	3	21	11.67	4.66	-0.11	0.17	-0.91	0.34
2.VHS	7	47	26.71	8.88	0.05	0.17	-0.46	0.34
3.SWLS	5	35	24.11	6.62	-0.65	0.17	0.11	0.34
4.SHS	10	22	18.88	2.72	-0.79	0.17	0.06	0.34
5.PA	12	50	33.85	7.11	-0.2	0.17	0.05	0.34
6.NA	10	39	19.76	7.05	0.63	0.17	-0.56	0.34
7.PWBS	124	318	233.54	35.5	-0.12	0.17	-0.49	0.34
8.PSS	10	47	26.32	6.42	0.25	0.17	0.6	0.34
9.SGABS-RT	5	20	15.65	2.83	-0.43	0.17	-0.06	0.34
10.SGABS-IT	24	97	63.36	12.92	-0.29	0.17	0.12	0.34

Note. IHBS = irrational happiness beliefs scale; VHS = valuing happiness scale; SWLS =satisfaction with life scale; SHB= subjective happiness scale; PA = positive affect; NA = negative affect; PSS = perceived stress scale; PWBS = psychological well-being scale, SGABS-RT = shortened general attitude and beliefs scale rational thinking, SGABS-IT = shortened general attitude and beliefs scale irrational thinking

When performing EFA, it is important to make a decision as to the number of factors to retain in order to represent the data and explore underlying relationships. Different techniques have been suggested to identify the number of factor to extract. These techniques can be based on K1-Kaiser's eigenvalue greater than one technique (Kaiser, 1960), Cattell's Scree test (Cattell, 1966) and Horn's Parallel Analysis (Horn, 1965). These techniques were considered in determining the number of factors to retain

as using multiple techniques is more logical in identify an accurate number of factors (Fabrigar *et al*., 1999). In this regard, the K1 method and the Scree plot were firstly taken into account to decide the number of factors for extraction. These two methods were used due to their ease of use in SPSS in identifying the number of factors alongside being the most utilised technique in practice (Courtney & Gordon, 2013). One factor was determined based on these two techniques with an Eigen value of 2.29 for the scale, thus explaining 76.5 of the total variance. Secondly, parallel analysis was applied to confirm the underlying latent factor structure as research has shown that, compared to the aforementioned techniques, parallel analysis is the most suitable and correct technique in identifying the number of factors (Fabrigar *et al*., 1999). This technique relies upon a comparison of a random set of eigenvalues obtained from purely random data to the observed eigenvalues derived from the sample data (Fabrigar *et al*., 1999). Due to this comparison, the number of factors' eigenvalues retained from the sample data should be greater than eigenvalues in a random data for the factor to be retained (Yu, Popp, DiGangi, & Jannasch-Pennell, 2007). Based on this criterion, the second observed eigenvalue in actual dataset (2.294, 0.434) failed to exceed the second random eigenvalue (1.112, 0.999) calculated from 1,000 generated datasets with 207 subjects and 3 variables, suggesting that a one-factor solution is best represent the data. Accordingly, one factor solution (see Table 2) was obtained using ML method without rotation as the data only loads on one factor.

Table 2 presents initial and extracted communalities and factor loadings generated through maximum likelihood extraction. As seen in the Table 2, the item loadings on the scale are robust based on the Kline's (1986) notion in which criterion of the items inclusion on factor loading should be above .3. It is obvious from the Table 2 that three items highly loaded on one factor ranging between 0.71 and 0.87. In addition, the

differences between initial and extracted communalities are not very large suggesting that adequate number of factor was retained (Wood, Linley, Maltby, Baliousis, & Joseph, 2008). This result indicated that the scale was a unidimensional scale.

Table 2. Factor matrix of the three items of the IHBS obtained through Maximum Likelihood Analysis

Items	Factor loadings	Communalities	
		Initial	Extracted
1.I should always be happy in all aspects of my life	0.71	0.43	0.50
2.I must always be happy in all aspects of my life	0.84	0.56	0.70
3.I ought always to be happy in all aspects of my life	0.87	0.58	0.76

Convergent Validity

After showing that the IHBS met adequate psychometric properties, the next step was to explore convergent and discriminant validity of the scale. To test the convergent validity, the irrational happiness beliefs was correlated with relevant existing happiness, well-being and irrational beliefs measures used in the study. This analysis was performed by running Pearson product-moment correlation. In addition to the correlations, we have also reported the standard criteria of effect size recommended by Cohen (1992) to show the importance of correlations. According to this criterion, correlation values greater than .5 represent a large effect size, correlation values greater than .3 and smaller than .5 present a medium effect size and correlation values smaller than .3 and greater than .1 represent a small effect size.

Table 3 shows the correlations among the variables used in this study. As expected, irrational happiness beliefs correlated positively with valuing happiness and negatively associated with general psychological well-being with a large effect size. A

positive correlation was found between irrational happiness beliefs and perceived stress with a medium effect size. In addition, in terms of the subjective well-being, negative correlations were found between irrational happiness beliefs and positive affect, satisfaction with life, and subjective happiness with a small to medium effect size while a positive correlation occurred between irrational happiness beliefs and negative affect with a medium effect size. When it comes to shortened general attitude and beliefs variable, a positive correlation was found between irrational happiness and general irrational thinking whereas a negative correlation was obtained between irrational happiness and rational thinking with medium effect size.

Discriminant Validity

Discriminant validity was tested to determine whether irrational happiness beliefs construct could be discriminated from variables designed to measure a different construct. To this end, irrational happiness beliefs was compared to valuing happiness. This variable was selected because valuing happiness appears to be theoretically similar with irrational happiness beliefs. Therefore, it would be fruitful if irrational happiness beliefs can be segregated from valuing happiness construct. We adapted heterotrait-monotrait (HTMT) ratio method (Henseler, Ringle, & Sarstedt, 2015) to establish discriminant validity. The HTMT is a method to calculate a ratio of the correlation of indicators across variables to the geometric mean of the average correlation within the same variable (Henseler et al., 2015). Henseler et al. (2015) recommended applying a cut-off value of .85 to evaluate discriminant validity by using HTMT method. In this criterion, the comparison between cut-off value of .85 and an estimate of the correlation between constructs are considered in determining discriminant validity. A ratio less than .85 indicate that discriminant validity exists between two constructs. That is to say, two constructs are more likely to differ from each other. However, a ratio greater than .85

present that a lack of discriminant validity exists between two constructs. That is, two constructs highly overlap and are more likely to measure the same construct. Given the value of other discriminant validity techniques, in the present study, therefore, the HTMT method was used as the definitive guide to detect discriminant validity of the Irrational Happiness Scale because Voorhees et al. (2015) suggested that a cut-off value of .85 present as the best approach for discriminant validity. Based on this criterion, we have calculated ratio correlations of irrational happiness, and valuing happiness across variables to the geometric mean of the average correlation within the same variable. A ratio of .66 was obtained between irrational happiness beliefs and valuing happiness. Since the ratio is less than the threshold value of .85, then we can conclude that discriminant validity is established.

Table 3. Correlation between irrational beliefs happiness, valuing happiness, positive affect, negative affect, stress and psychological well-being

	1	2	3	4	5	6	7	8	9	10
1. Irrational happiness beliefs	-									
2. Valuing happiness	.56**	-								
3. Satisfaction with life	-.30**	-.26**	-							
4. Subjective happiness	-.36**	-.33**	.69**	-						
5. Positive affect	-.29**	-.25**	.59**	.59**	-					
6. Negative affect	.42**	.46**	-.47**	-.59**	-.42**	-				
7. Psychological well-being	-.51**	-.52**	.64**	.70**	.67**	-.68**	-			
8. Perceived stress	.35**	.48**	-.24**	-.38**	-.25**	.57**	-.47**	-		
9. SGABS-Rationality	-.39**	-.36**	.43**	.42**	.40**	-.42**	.65**	-.31**	-	
10. SGABS-Irrationality	.40**	.34**	-.29**	-.31**	-.26**	.46**	-.47**	.34**	-.37**	-

Note. ** $p < 0.01$; SGABS = shortened general attitude and beliefs scale

Confirmatory Factor Analysis

The findings of the first study suggest that the irrational happiness beliefs measure is a unidimensional scale generated through EFA. To confirm the proposed one-factor solution of the measure, we performed confirmatory factor analysis (CFA) to provide further evidence of the construct validity for the scale. To do so, CFA with maximum likelihood estimation, as requires normal distribution of the data and a continuous variable, was conducted in order to examine the structural validity of the scale using AMOS 24 on the second set of data. Thus, the unidimensional factor structure of the measure was examined through the use of a single-factor measurement model in the Structural Equation Modelling. The unidimensional factor solution hypothesised a single latent variable, as named irrational happiness beliefs, with three indicators. The error terms in the model remained as uncorrelated.

In CFA, a number of fit indices are used for the acceptability of a model. In the literature, it is recommended to benefit from multiple statistical indices when the appropriateness of the theoretical model to the data is evaluated (Hu & Bentler, 1999). Although each of the fit indices assesses the model fit somewhat differently, using several indices increases the confidence held in evaluating a model. Some of these fit indices include (but are not limited to) the comparative fit index (CFI), goodness of fit index (GFI) and incremental fit index (IFI) where the values of CFI, GFI and IFI greater than .90 are used as indicators of an acceptable model fit. A standardised root mean square residual (SRMR) where values lower than .06 presents an acceptable fit. The goodness of the fit statistics indicates that the unidimensional model presented a good fit model to the data: SRMR = .01, CFI = .99, GFI = .99, IFI = .99 (see Figure 2).

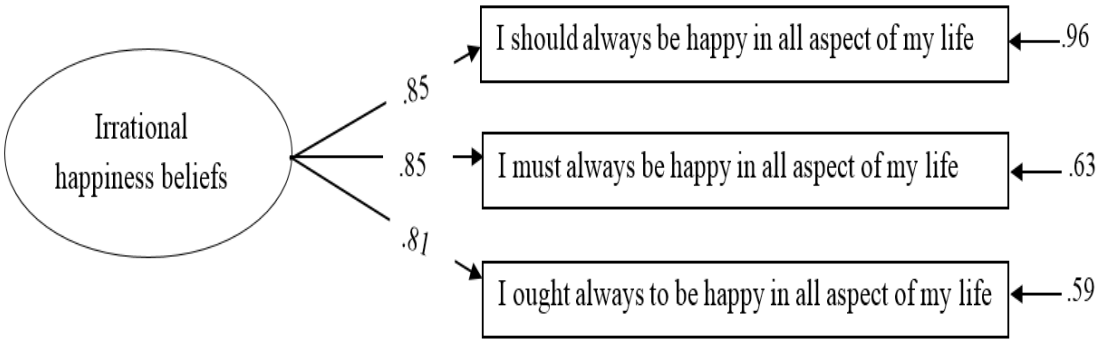

Figure 2. Standardised Factor Loadings of Irrational Happiness Beliefs Scale

Figure 2 illustrates the path diagram with standardised values indicating a one factor model where the latent variable is presented by three observed variables. All three items were assumed to load on the latent variable of irrational happiness beliefs. The standardised factor loadings are illustrated by the values on the arrows from the latent variable to the indicators. All indicators have similar high standardised factor loadings of .81, .85 and .85, respectively.

Discussion

This study has sought to develop the Irrational Happiness Beliefs Scale and provide evidence of its reliability and validity across two UK sample comprising university students. The psychometric properties of the IHBS have been explored by means of internal consistency, exploratory and confirmatory factor analysis and convergent and discriminant validity. Firstly, the findings have demonstrated that the IHBS has high internal consistency with Cronbach's alpha (i.e., reaching 0.84) with this suggesting that the scale has good reliability. Secondly, the exploratory factor analysis indicated that all of the items on the scale presented high factor loading (the lowest was 0.71) on one factor, thus suggesting that the scale is unidimensional. The present findings

also provide additional evidence as to the construct validity of the IHBS. In terms of the convergent validity, the scale was positively correlated with valuing happiness, negative affect, perceived stress scale, and irrational thinking. As expected, the irrational happiness beliefs scale was negatively correlated with satisfaction with life, subjective happiness, positive affect, psychological well-being and rational thinking. Furthermore, within the scope of the discriminant validity, the IHBS showed some level of initial discriminant validity with valuing happiness. The findings support the construct validity of the IHBS. Moreover, the CFA provided further solid evidence for the single factor structure of the IHB measure.

The results of the study suggest that although a lot of research emphasises a need/desire to be happy (King & Napa, 1998; Lyubomirsky *et al*., 2005), the belief that for all things and at all times one "must" be happy, "should" be happy or "ought to" be happy are irrational happiness beliefs and are concerned with negative aspects of happiness. In contrast to the Valuing Happiness Scale (Mauss *et al*., 2011), it is worth noting that the IHB measurement items content was directly derived from the core theme of REBT (Ellis, 1962). Hence, the measure was worth using in the subsequent studies.

The results of the current study have important implications for well-being studies. Both practitioners and researchers can use the newly developed scale for several reasons. Firstly, although the IHBS is short, we have indicated that it meets adequate psychometric properties. Secondly, due to its short application duration and comfort of use, it allows researchers to collect data easily within a short period of time. Thirdly, the scale might help researchers to examine the construct of irrational happiness more comprehensively. Fourthly, the scale might facilitate understandings as to the possible differences of irrational happiness beliefs across cultures. Finally, research as to the negative aspects of happiness is not being undertaken at a satisfactory level at present.

Accordingly, we believe that the scale could give significant guidance for the future research. Using the irrational happiness beliefs measure alongside other happiness measures (e.g., the Valuing Happiness Scale) may help researchers to develop a better understanding of the underlying dynamics of happiness and well-being, namely in the measure being applicable as an instrument in examining and understanding the effect of irrational happiness beliefs on life outcomes (e.g., psychological well-being). Understanding how irrational happiness beliefs are related to and predict well-being indices can help researchers and practitioners to develop effective interventions to increase general well-being. For example, in considering the relationship between irrational happiness beliefs and theoretically similar and dissimilar constructs, clinicians or practitioners can use the results of the present study to determine the focus point of the given therapy process whereupon they can improve the life satisfaction and subjective well-being of clients by reducing their irrational happiness beliefs instead of passively ignoring the role of irrational happiness beliefs on well-being.

The present research includes several limitations that should be considered when evaluating the study's results. Firstly, the participants formed a convenience sample of university students that somewhat limits the generalisability of the results to other samples. To address this issue, these findings should thus be replicated with more representative samples among socioeconomically diverse populations (such as a community sample) to obtain robust evidence as to the IHB measure. Secondly, the validation of the scale should be tested in different contexts to measure levels of irrational happiness beliefs across cultures, thus ensuring that the scale can yield significant advantages to cultural-based studies of happiness. Thirdly, the predictive validity of the IHB measure was not tested and thus the role of IHB in predicting health-related outcomes remains unknown and requires further examination.

In summary, the preliminary findings suggest that the IHBS is a reliable and valid measure of assessing irrational happiness beliefs among United Kingdom samples. Although further study is required to extend our preliminary results, researchers can rely on the IHBS in terms of it presenting good psychometric properties for determining levels of irrational happiness.

Chapter Three

Testing the Factor Structure of Irrational Happiness Beliefs against Valuing Happiness

Abstract

The present study analysed the structural relationships between irrational happiness beliefs and valuing happiness. Data was collected using two independent samples recruited from the UK (n = 157) and the USA (n = 157). The participants completed measures of irrational happiness beliefs and valuing happiness via the use of online survey. The results provide a model that views irrational happiness beliefs and valuing happiness as two distinct-yet-related constructs in measuring dysfunctional aspects of happiness. Within this model, the irrational happiness beliefs construct is best represented by one factor with three indicators while the valuing happiness construct is best represented by three factors with two indicators per factor. Irrational happiness beliefs were found to be positively correlated with all factors of valuing happiness. The results suggest that understanding the conceptual link between irrational happiness beliefs and valuing happiness has important theoretical and practical implications for both researchers and practitioners.

Introduction

There is now an emerging body of literature as to the paradoxical effect of the pursuit of positive emotions, particularly concerning happiness. Investigation as to the paradoxical effect of happiness has become a focal point within the field of psychology whereby the concept of valuing happiness has been presented as mirroring the detrimental effect of positive emotions (e.g., happiness) upon one's level of subjective and psychological well-being (Mauss et al., 2011). Valuing happiness is conceptualised in such a way as concluding that the pursuit of happiness to an extreme degree may cause a decreased level of happiness (Ford & Mauss, 2014; Mauss et al., 2011). The theoretical foundation of this construct rests on goal-orientated behaviour around values in which negative outcomes (e.g., disappointment) can emerge from the relationship between valuing something highly and the standards by which the individual then judges their achievements in terms of those values (Carver & Scheier, 1981; Mauss et al., 2011). Mauss et al. (2011) found that when applying this dynamic to happiness, achieved by presenting a unidimensional 7-item measure of valuing happiness, evidence was found to suggest that valuing happiness leads individuals to act less positively in several well-being states (low stress environments, reactions to positive emotion induction). Furthermore, cross-sectional and experimental studies using the valuing happiness measure have shown the efficacy of valuing happiness as a predictor of higher levels of negative affect, manic disturbance and depression and that lower levels of positive affect, affect balance and life satisfaction (Ford, Mauss & Gruber, 2015; Ford, Shallcross, Mauss, Floerke & Gruber, 2014; Mauss et al., 2012).

While valuing happiness is proposed as a unidimensional measure of happiness (Mauss et al., 2011), recent research as to the factor structure of the valuing happiness measure has not supported the one-factor solution of the scale. Luhmann, Necka,

Schönbrodt and Hawkley (2016), in producing a cross-cultural study (e.g., United States and Germany) to investigate the factor structure of the Valuing Happiness Scale, found that by dropping one item (Item 4) from the scale, a three-factor solution could be found that best described the relationship between the responses with two items on each factor.

We proposed an approach as to valuing happiness scale that builds on the reflections of Luhmann et al. (2016) to exactly consider the structure of items of the valuing happiness scale. With this approach, for the two factors of valuing happiness scale we return to the emphasis that Mauss et al. (2011) placed on goal type theory in developing the valuing happiness scale, but consider a distinction made within goal type theory of the difference between two common types of goals: attainment; where current state differs from a desired state, and maintenance; where there is some equality between current and desired state and the goal is to maintain that equality (Brodscholl, Kober, & Higgins, 2007; Markus & Kitayama, 1991; Yang, Stamatogiannakis, & Chattopadhyay, 2015). Specifically, we suggest that items on the valuing happiness scale such as "Feeling happy is extremely important for me [item 5]" reflect valuing happiness in terms of attainment goals. We also suggest that items such as "How happy I am at any given moment says a lot about how worthwhile my life is [item 1]" reflect valuing happiness in terms of maintenance goals. With regards to the other component of valuing happiness scale, we again return to the emphasis that Mauss et al. (2011) and other researchers (e.g., Mclntosh & Martin, 1992) highlighted that being obsessive with happiness may be backfired and detrimental to well-being. Obsession can be defined as recurrent and persistent thoughts or impulses that are experienced, at some time during the disturbance, as intrusive and unwanted (American Psychiatric Association, 2013). We suggest that items on the valuing happiness scale such as "If I don't feel happy, maybe there is something wrong with me [item 7]" reflect valuing happiness in terms of obsession.

We argue that since valuing happiness is proposed as a maladaptive factor that affects well-being, examining the factor structure of irrational happiness beliefs as a potential maladaptive factor that affects well-being against valuing happiness would be useful in terms of gaining a broader understanding as to the factors that negatively affect well-being. This comparison would also be fruitful in simplifying the relationship between irrational happiness beliefs and valuing happiness. To this end, we tested a number of competing models using the confirmatory factor analysis approach by collecting data from both the USA and the UK across two independent samples. The rationale for choosing these two countries was opportunistic in terms of a platform available, Amazon Mechanical Turk, to collect data. The first model was a unidimensional solution that assumed that all items on the Irrational Happiness Beliefs and Valuing Happiness Scales would load on one general latent factor. The second model was a two-factor solution as proposed two factors in which three items on the Irrational Happiness Scale would load on their corresponding factor while seven items on the Valuing Happiness Scale would load on their corresponding factor. The third model was a two-factor solution due to the dropping of one item (Item 4) on valuing happiness. This model assumes that three items on the Irrational Happiness Scale would load on their associated factor whereas six items on the Valuing Happiness Scale would load their associated factor. The final model was a four-factor solution due to the dropping of one item (Item 4) on valuing happiness, with this reflecting the findings of Luhmann et al. (2016). This model proposes that three items on the Irrational Happiness Scale would load on their associated factor, whereas six items on the Valuing Happiness Scale would load on three factors of the Valuing Happiness Scale with two items loading on each factor. Thus, the present study sought to examine the factor structure of the irrational happiness beliefs measure against the valuing happiness measure.

Method

Participants

In the present study, two different samples were used for the analyses. Sample 1 consisted of 157 undergraduate students from the School of Psychology at the University of Leicester in the United Kingdom – 134 (85.4%) of which were females and 23 (14.6%) males - whose ages ranged between 18 and 35 years (*M*=19.5, *SD*= 2.3). Three participants did not provide information about their age. Participants were given course credits for taking part in the study. Sample 2 consisted of 157 participants of whom 89 (56.7%) were females and 68 (43.3%) males. The ages of the participants ranged from 18 to 64 (*M* =37.8, *SD* = 11.8). Seven of the participants did not provide information about their age. The participants were recruited from the USA by means of Amazon's Mechanical Turk (MTurk) website. The participants were predominantly Caucasian (82.2%), followed by Black (7.6%), Mixed Race (5%), South and East Asian (3.8%) and other (3.2%). Of the participants, 46.5% reported being married, while 42.75% were single, 7% were divorced, 2.5% were widowed and 1.3% were separated.

Measures

Irrational Happiness Beliefs Scale. This scale is a 3-item scale measuring to what extent people hold irrational happiness beliefs to an absolute level and has been developed throughout the previous chapters. Here, answers are given on a 7-point Likert scale ranging from 1 = *strongly disagree* to 7 = *strongly agree.* A sample item is "I must always be happy in all aspects of my life." In the present study, the Cronbach's α was .87 for the UK sample and .91 for the USA sample.

Valuing Happiness Scale: This scale is a 7-item scale, as developed by Mauss, Tamir, Anderson and Savino (2011), measuring the extent to which people value

happiness to an extreme degree. Items are scored between 1 (*strongly disagree*) and 7 (*strongly agree*). A sample item is "I am concerned about my happiness even when I feel happy". In the original paper, the internal consistency of the scale was reported as .76. Indeed, in the original form of the scale, it was found that the scale consisted of two factors, with an Eigenvalue greater than 1 explaining 41% of the variance for Factor 1 and 17% of the variance for Factor 2. However, Mauss *et al*. (2011) retained one factor for the purpose of the concept of what they aimed to measure. In the present study, the Cronbach's α was .82 for the UK sample and .74 for the USA sample.

Procedure

All of the participants were administered the scales through online survey, whereby the electronic survey system was set up in such a way that the respondents had to answer the questions. It was not possible to record how many participants simply did not complete the online survey due to the design of the software. As per standard ethical practice, participants could withdraw from the study at any time by simply closing their web browser. Participants were asked to give their consent for the data to be used for the purposes of the present study. Online consent was obtained from all of the participants. Participants were assured about the anonymity and confidentially of the data and the study was approved by the School of Psychology Ethic Committee at the University of Leicester.

Data Analysis

Two samples were used to cross-validate the present findings. Both samples were subjected to confirmatory factor analysis. Preliminary analysis was conducted to explore the suitability of the data for analysis. The *Z* statistic was computed to determine univariate outliers. Notably, no univariate outliers were found since all *Z* scores ranged

between +3.29 and -3.29. The Mahalanobis distance was estimated to identify multivariate outliers. Two multivariate outliers were found and removed from the Sample 2 dataset (Tabachnick & Fidell, 2001). The skewness and kurtosis statistics were computed to examine the normality assumption for each of the items within the valuing happiness and irrational happiness beliefs measures. We found that the items did not seriously violate the assumption of normality as they all fell within the range of +2 and -2 (George & Mallery, 2010; Tabachnick & Fidell, 2001). This analysis was performed using SPSS 24.0 and AMOS 24.0 for Windows.

Results

Table 4 presents the mean, standard deviation, skewness, kurtosis and inter-correlation statistics for the irrational happiness beliefs and valuing happiness items. As shown in Table 4 and in relation to the items level, the items as to irrational happiness beliefs and valuing happiness generally positively correlated with each other. Table 6 illustrates the correlation between the irrational happiness beliefs and valuing happiness components across two samples. Here, irrational happiness was found to be positively associated with all components of valuing happiness – where the correlation ranged between .26 and .52 for the UK sample and between .21 and .57 for the USA sample.

Confirmatory factor analysis was performed to compare the goodness of fit statistics of the competing models across the UK and USA samples using AMOS 24. To assess the model fit for each of the proposed models, multiple fit statistics were used. We specifically used the followings; goodness of fit index (GFI; Jöreskog & Sörbom, 1993), comparative fit index (CFI; Bentler, 1990), root mean square error of approximation (RMSEA; Steiger, 1990), standardised root mean square residuals (SRMR; Hu & Bentler, 1999) as well as the chi square test ($\chi 2$; Bollen, 1989) and degree of freedom and relative

chi-square test (CMIN/DF; Bollen, 1989). The following cut-off values were considered for the fit statistics when the goodness of fit of the competing models are assessed. Here;

- GFI and CFI values above 0.95 present a good fit whereas values above 0.90 present an acceptable fit.
- SRMR and RMSEA values below .06 indicate a good fit while values below .08 present an acceptable fit.
- CMIN/DF values below 3 signify a good fit while values below 5 signify an acceptable fit.

As a rule of thumb, it is suggested that the probability $\chi 2$ value should not be significant. Since the $\chi 2$ is sensitive to sample size, it is likely that this test provides a significant probability value even in a good fitting model (Byrne, 2001). The goodness-of-fit statistics for each of the competing models are presented in Table 5.

Unsurprisingly, the chi-square statistics were significant both in the UK and USA samples across all the proposed models except for the four-factor model in the USA sample. As shown in Table 5, the four-factor model demonstrated a clear increment over the unidimensional, two-factor and two-factor without item 4 on valuing happiness models. In contrast to other statistics (e.g., RMSEA for the UK sample), all of the fit statistics of this model (CMIN/DF = 2.824, CFI = .923, GFI = .933, RMSEA = .108, SRMR =.0860 for the UK sample and CMIN/DF = 1.333, CFI = .989, GFI = .963, RMSEA = .046, SRMR =.0339 for the USA sample) are notably satisfactory and better than those of the aforementioned competing models. These results suggest that the proposed four-factor model with 9 items – in which three items on the Irrational Happiness Scale are loaded on their associated factor, whereas six items on the Valuing Happiness Scale are loaded on three components of the Valuing Happiness Scale with

two items loading on each factor – presented a good fit against the unidimensional, two-factor and two-factor with 9 items models. The valuing happiness components include two items per factor. The first component included item 1 and item 3 while the second and third components included item 5 and item 7, and item 2 and item 6, respectively (shown in Table 4).

Table 4. Mean, standard deviation, skewness, kurtosis and inter-correlation statistics for the Irrational Happiness Beliefs and Valuing Happiness items

	Mean	*SD*	Skewness	Kurtosis	1	2	3	4	5	6	7	8	9	10
UK sample														
Irrational happiness beliefs														
1. "must always be happy"	4.44	1.74	-0.35	-0.76	1									
2. "should always be happy"	3.31	1.68	0.31	-0.68	.72**	1								
3. "ought always to be happy"	4.20	1.66	-0.16	-0.71	.69**	.69**	1							
Valuing happiness														
4. "worthwhile my life is"	3.57	1.83	-0.01	-1.19	.40**	.45**	.38**	1						
5. "have a meaningful life"	3.03	1.73	0.44	-0.93	.23**	.30**	.26**	.45**	1					
6. "value things in life"	3.59	1.64	0.16	-0.59	.36**	.36**	.29**	.30**	.27**	1				
7. "happier than I am"	4.32	1.74	-0.19	-0.83	.08	.14	.16*	.20*	.56**	.1	1			
8. "happy is important"	4.36	1.74	-0.19	-0.81	.09	.17*	.16*	.19*	.54**	.15	.96**	1		
9. "concerned about happiness"	2.99	1.79	0.66	-0.66	.08	.18*	.17*	.27**	.47**	.26**	.52**	.49**	1	
10. "something wrong"	4.08	1.77	-0.22	-0.89	.28**	.38**	.45**	.40**	.34**	.34**	.26**	.27**	.15	1

	Mean	*SD*	Skewness	Kurtosis	1	2	3	4	5	6	7	8	9	10
USA sample														
Irrational happiness beliefs														
1. “must always be happy”	4.44	1.74	-0.35	-0.76	1									
2. “should always be happy”	3.31	1.68	0.31	-0.68	.81**	1								
3. “ought always to be happy”	4.20	1.66	-0.16	-0.71	.79**	.73**	1							
Valuing happiness														
4. “worthwhile my life is”	3.57	1.83	-0.01	-1.19	.36**	.43**	.30**	1						
5. “have a meaningful life”	3.03	1.73	0.44	-0.93	.11	.09	.13	.34**	1					
6. “value things in life”	3.59	1.64	0.16	-0.59	.41**	.40**	.31**	.54**	.26**	1				
7. “happier than I am”	4.32	1.74	-0.19	-0.83	-.04	-.03	-.03	-.02	.33**	-.02	1			
8. “happy is important”	4.36	1.74	-0.19	-0.81	.50**	.50**	.37**	.52**	.24**	.41**	.16*	1		
9. “concerned about happiness”	2.99	1.79	0.66	-0.66	.19*	.16	.22**	.31**	.22**	.28**	.25**	.21**	1	
10. “something wrong”	4.08	1.77	-0.22	-0.89	.47**	.52**	.40**	.52**	.29**	.51**	.03	.52**	.36**	1

Note. ** $p < .01$; * $p < .05$; *SD* = standard deviation

Table 5. Confirmatory factor analysis fit statistics indicating the goodness-of-fit to the data of the different models proposed for the Irrational Happiness Beliefs and Valuing Happiness Scales

	X^2	df	p =<	CMIN/DF	CFI	GFI	RMSEA	SRMR
				UK (*n* = 157)				
Unidimensional	567.65	35	.00	16.22	.41	.64	.31	.18
Two-factor	176.82	34	.00	5.20	.84	.78	.16	.18
Two-factor without item 4 on VH	87.48	26	.00	3.37	.88	.88	.12	.10
Four-factor (Luhmann et al.'s (2016) model for VH)	59.30	21	00	2.82	.92	.93	.11	.09
				USA (*n* = 157)				
Unidimensional	190.10	35	.00	5.43	.76	.76	.17	.12
Two-factor	79.53	34	.00	2.34	.93	.92	.09	.07
Two-factor without item 4 on VH	39.19	26	.05	1.51	.98	.95	.06	.05
Four-factor (Luhmann et al.'s (2016) model for VH)	27.98	21	.14	1.33	.99	.96	.05	.03

Note: $X^{2\,=}$ chi-square, df = degrees of freedom, CMIN/DF = relative chi-square, GFI = goodness of fit index, CFI = comparative fit index, NNFI = non-normed fit index, RMSEA = root mean square error of approximation, SRMR = standardized root mean square residual, VH = valuing happiness

Table 6. Correlations between irrational happiness beliefs and valuing happiness components across UK and USA samples

	1	2	3	4
UK sample				
1. Irrational happiness beliefs	1			
2. Valuing happiness-maintenance	.52**	1		
3. Valuing happiness-attainment	.36**	.42**	1	
4. Valuing happiness-obsession	.26**	.46**	.56**	1
USA sample				
1. Irrational happiness beliefs	1			
2. Valuing happiness- maintenance	.46**	1		
3. Valuing happiness- attainment	.57**	.64**	1	
4. Valuing happiness- obsession	.21*	.43**	.41**	1

**. $p < 0.01$; $p < 0.05$

Discussion

The present study examined the factor structure of irrational happiness beliefs against the theoretically relevant construct of valuing happiness across two independent samples from the USA and the UK. Considering the findings of Luhmann et al. (2016), who proposed a three-factor model for the valuing happiness measure, the current findings support the three-factor structure of the valuing happiness measure. The inclusion of irrational happiness beliefs into the proposed model, whereby irrational happiness beliefs is conceptualised as a different dysfunctional construct yet one that is related to valuing happiness, provided support for the four-factor model of dysfunctional happiness. Within this proposed model, the irrational happiness beliefs construct is best represented by one factor with three indicators while the valuing happiness construct is

best represented by three factors with two indicators per factor. Here, irrational happiness beliefs scale was found to be positively correlated with all factors of valuing happiness.

These findings are in accordance with our conceptualisation of irrational happiness beliefs and valuing happiness as the constructs show themselves as two related-but-distinct constructs. This is not to say that irrational happiness beliefs and valuing happiness are indeed measuring the same thing, but rather that there are structural and conceptual associations between the two where both constructs are correlated to a certain extent by the sharing of some variance alongside the acknowledging of non-shared variance.

The present findings as to the valuing happiness construct are not compatible with the findings of Mauss *et al*. (2011) where valuing happiness was originally proposed as a unidimensional construct. Notably, these results confirmed the findings of Luhmann et al.'s (2016), where valuing happiness was suggested as being a multidimensional construct with three factors. This variation can be related to the characteristics of the sample used in each study (including the present study). While Mauss *et al*. (2011) used only female subjects, Luhmann *et al*. (2017) and the present study used both male and female participants. Importantly, further research is needed to verify the present findings.

This further suggests that the dysfunctional aspect of happiness can be conceptualised as a multidimensional model that deals with happiness both as an absolute and in valuing this to an extreme degree. This is important in terms of having a better understanding as to the paradoxical effect of happiness as these two constructs rest on different theoretical foundations – in that irrational happiness beliefs mainly views happiness as an absolute indicating the highest level of an ultimate goal while valuing happiness to an extreme degree does not entirely imply the highest level of an ultimate

goal. In other words, when happiness is extremely valued, this does not imply that happiness is always significant. The distinction between irrational happiness beliefs and valuing happiness is also useful in practice in relation to interventions aimed at increasing happiness being prepared and implemented. The present findings are particularly important in terms of producing empirical evidence for clinical psychologists who measure dysfunctional happiness. This is because being aware of the structural links between irrational happiness beliefs and valuing happiness can allow clinical psychologists to comprehensibly interpret findings and provide better advice. This study further provides evidence of the scale applicability by using a community sample.

Several limitations of this research should be taken into consideration when the results are evaluated. Firstly, the samples used in this study were drawn from two Western countries - the UK and the USA. Considering that culture is an important factor in the perception and pursuit of happiness (Joshanloo & Weijers, 2014; Oishi, Graham, Kesebir & Galinha, 2013), the current findings are limited in their application to non-Western cultures. Further work conducted as to collectivist cultures is therefore needed to verify the emerging factorial relationships between the variables. Secondly, the study design was based on cross-sectional analyses restricting causal relationships among the variables.

Chapter Four

Investigating the Relationship between Irrational Happiness Beliefs and Subjective Well-being over Time

Abstract

Investigations about the variables that affect well-being are useful for advancing the knowledge held as to the correlates and causes of well-being in both theory and practice. The present study sought to examine whether irrational happiness beliefs contribute to the affective component of subjective well-being (namely positive affect and negative affect) over time. The study also attempted to provide evidence of the test-retest reliability of the scale. The 103 participants (15 males and 88 females) aged between 18 and 29 years old (M = 19.39 years, SD = 1.62), completed measures assessing irrational happiness beliefs, positive affect and negative affect both at Time 1 and Time 2 three months apart. The results illustrated that irrational happiness beliefs was negatively correlated with positive affect only at Time 1. However, the study failed to support for the contribution of irrational happiness beliefs on positive affect and negative affect over time yet did provide evidence of the test-retest reliability of the irrational happiness beliefs measure. The findings and possible limitations of this study are also discussed in this chapter.

Introduction

The concept of subjective well-being is a salient concept within the Positive Psychology discipline, with numerous empirical and theoretical studies having been conducted to determine the correlates and causes of subjective well-being (e.g., Lyubomirsky, 2005a). Subjective well-being typically focuses on what individuals think and how they feel about their lives when they make cognitive and affective judgements as to their existence (Seligman & Csikszentmihalyi, 2000). This relies on short-term life engagement in terms of attainment and the experience of positive emotions such as pleasure, vitality and happiness alongside the avoidance of pain and negative emotions such as sadness and stress (Ryan & Deci, 2001).

Typically, there are two major schools of well-being; Hedonic Well-Being where the focus is to attain pleasure and avoid pain and Eudaimonic Well-Being where the focus is to identify genuine human potential, purpose in life and engagement with life challenges (Ryan & Deci, 2001; Ryff & Keyes, 1995). Subjective well-being rests on the hedonic approach of well-being. In building upon the hedonic approach of well-being, Diener (1984) provided an operational definition of subjective well-being by considering affect and life satisfaction. In that definition, subjective well-being was characterised as a multidimensional construct that includes at least three elements; life satisfaction, the presence of positive emotions and the absence of negative emotions (Deci & Ryan, 2008; Diener, 1984; Diener & Lucas 1999; Diener, Napa Scollon & Lucas, 2003). Positive affect and negative affect determine *affect balance* as these are affected by daily life events (such as eating tasty food and facing traffic congestion), while life satisfaction refers relatively to a longer-term cognitive judgement of an individual's own life (Yang & Srinivasan, 2016). These elements are distinct, both theoretically and experimentally, but collide with one another (Ryan & Deci, 2001). People high in subjective well-being

can be characterised as having greater satisfaction with life, experience of more positive emotions and less negative emotions.

Studies have indicated that a wide array of factors is associated with subjective well-being. Notably, personality traits were found to have significant effects upon subjective well-being, with adaptive traits (e.g., extraversion) being positively related with positive affect and life satisfaction and negatively related with negative affect. In contrast, maladaptive traits (e.g., neuroticism) are negatively related with positive affect and life satisfaction, and positively related with negative affect (Diener & Lucas, 1999; Lyubomirsky, Sheldon & Schkade, 2005). Demographic variables (Diener *et al*., 1999), socioeconomic factors (Zhou *et al*., 2015) and physical health (Tovar-Murray, 2010) are other factors that influence subjective well-being. Furthermore, as maladaptive variables, valuing happiness (Mauss *et al*., 2011) and fear of happiness (Joshanloo, 2013a) have been found to be negatively associated with subjective well-being. This study sought to investigate whether holding irrational happiness beliefs also affects one's level of subjective well-being over time.

Present Study

In considering the importance of subjective well-being in positive human functioning, it would be useful to expand the variables that affect one's subjective well-being over time. As the concept of irrational happiness beliefs is newly presented, it would be worthwhile examining how irrational happiness beliefs are associated with subjective well-being over time. Establishing the effect of irrational happiness beliefs on well-being over time would enhance our understanding of subjective well-being and its associated factors (e.g., irrational happiness beliefs), thus allowing the preparation and development of effective ways through which to promote well-being. As such, the present

study sought to investigate whether irrational happiness beliefs would predict subjective well-being over time. To this end, we first hypothesised that irrational happiness beliefs would be related to subjective well-being domains – such as positive affect and negative affect. We then hypothesised that irrational happiness beliefs would predict lower subjective well-being over time. In the present study, we also sought further evidence as to the reliability of the Irrational Happiness Beliefs Scale. Previous studies have shown that there are various ways of assessing the reliability of measurements, with two commonly used forms of assessment being internal consistency reliability and test-retest reliability whereby the former tests reliability by replicating a measure with different samples and the latter examines reliability by administering a measure several times with the same sample to determine the stability of a measurement (Hendrickson, Massey & Cronan, 1993). Since internal consistency reliability was established in the study detailed in Chapter Three, the focus of the present study was to examine the stability of the irrational happiness beliefs measure. As a consequence, we considered the test-retest reliability for this scale.

In short, the focus of this study was given to two facets; (a) to investigate the value of the irrational happiness beliefs measure by considering its contribution to subjective well-being at a second time point after controlling for associated positive affect and negative affect at a first time point and, (b) to provide evidence of the test-retest reliability of the Irrational Happiness Beliefs Scale.

Method

Participants

The 103 participants of this study comprised of 15 males and 88 females and ranged in age between 18 and 29 years old (M = 19.39 years, SD = 1.62). Three

participants failed to provide their age. This was a convenience sample comprising of undergraduate and postgraduate students enrolled in Psychology programmes at the University of Leicester. The measures were administered online in a university experiment participation scheme wherewith participants could participate in the study in return for receiving course credits. Participants, were volunteers, completed an informed consent form before partaking in the study online through an electronic survey system. Participants were assured as to the confidentiality and anonymity of the data. Administrations of the measures were the same at both Time 1 and Time 2.

Measures

The participants completed the irrational happiness beliefs measure presented in our previous study. Additionally, we asked the participants to complete the Positive and Negative Affect Scales measure to assess subjective well-being.

Positive and Negative Affect Scales (PANAS: Watson, Clark & Tellegen, 1988). The PANAS is a 20-item self-report scale that measures the two affective components of subjective well-being. The scale is rated on a 5-Likert-type scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*) for the past week.

Procedure

This study was a follow-up to our second study in which we examined the construct validity of the Irrational Happiness Beliefs Scale. The participants of that study were asked to take part in a follow-up study, with 103 of the original 157 participants subsequently agreeing to take part in the same study again. These subjects were re-administered the measures of irrational happiness beliefs and PANAS three months (Time 2) after the first administration (Time 1) of the study. The institutional ethical committee reviewed and approved the ethical procedure for the study.

Data Analysis

Prior to the analysis of the findings, preliminary analysis was performed to explore whether there were any missing values in the dataset. Following this, no missing values were found. The *Z* statistic was carried out to identify any univariate outliers, with none being found since all of the *Z* scores varied between +3.29 and -3.29. Multicollinearity was performed using a series of standard linear regressions. Using variance inflation factor (VIF) cut-off values of at least 5 and tolerance statistics of less than .2 that refer to the multicollinearity issue (Kutner, Nachtsheim & Neter, 2004), no multicollinearity issue was detected as the VIF values and tolerance factors for the independent variables were respectively no greater than 3.037 and no smaller than .329. The Pearson-product moment correlation was computed among the study variables, while an array of hierarchical regression analyses were performed to investigate to what extent irrational happiness beliefs could contribute to changes in subjective well-being over time. All the analysis was performed using SPSS 24 for Windows.

Results

Table 7 presents the minimums, maximums, means, standard deviations, skewness, and kurtosis statistics with the associated standard errors. As shown in Table 7, the data did not violate the univariate normality as all of the skewness and kurtosis values fell within a "very good" range of +1 and -1 (George & Mallery, 2010; Tabachnick & Fidell, 2001). Prior to running the regression analysis, we performed Pearson correlation analysis. As presented in Table 8, irrational happiness beliefs shared a significant negative correlation with positive affect at Time 1, but not with negative affect. Although the pattern of the correlations is in the expected direction, an insignificant correlation was found between irrational happiness beliefs and positive

affect, and negative affect at Time 2. Table 8 also presents that the irrational happiness beliefs scores at Time 1 and at Time 2 were highly correlated (r = .72) and the reliability coefficient was positive and high at Time 2 (α= .89). These results indicate that the irrational happiness beliefs measure is reliable whereby evidence as to the test-retest reliability is provided at three months after the first implementation of the measure.

Table 7. Descriptive statistics for the study variables

	Min	Max	Mean	*SD*	Skewness		Kurtosis	
					Statistic	*SE*	Statistic	*SE*
Time 1								
Irrational happiness beliefs	3.00	21.00	11.93	4.42	-0.12	0.24	-0.67	0.47
Positive affect	20.00	49.00	33.89	6.40	0.20	0.24	-0.52	0.47
Negative affect	11.00	34.00	20.11	4.92	0.34	0.24	-0.43	0.47
Time 2								
Irrational happiness beliefs	3.00	21.00	12.23	4.70	-0.16	0.24	-0.76	0.47
Positive affect	19.00	50.00	35.23	6.53	0.06	0.24	-0.56	0.47
Negative affect	10.00	31.00	18.36	5.19	0.59	0.24	-0.39	0.47

Note. *SD* =standard deviation, SE = standard error

We performed an array of multiple regression analyses to examine the value of the irrational happiness beliefs measure by considering whether it predicted the affective components of subjective well-being (positive affect and negative affect) at a second time point (Time 2), three months after the first implementation of the study. To this end, we controlled for the corresponding positive affect and negative affect at Time 1 to eliminate its influence upon the responses of the participants at Time 2. In these analyses, positive

affect and negative affect at Time 2 were considered as dependent variables whereas the corresponding measures of positive affect and negative affect at Time 1 were considered as the independent variables in Step 1.

Table 8. Alpha reliabilities and correlations between the study variables at Time 1 and Time 2

	α	1	2	3	4	5	6
Time 1							
1. Irrational happiness beliefs	.89	1					
2. Positive affect	.80	-.24*	1				
3. Negative affect	.64	.14	-.64**	1			
Time 2							
4. Irrational happiness beliefs	.89	.72**	-.16	.14	1		
5. Positive affect	.82	-.12	.57**	-.48**	-.14	1	
6. Negative affect	.76	.15	-.37**	.64**	.16	-.69**	1

*. $p < 0.05$; **. $p < 0.01$

In this model, irrational happiness beliefs at Time 1 was used as the independent variable and entered in Step 2. As the R^2 change in regression analysis is an advantageous measure in examining the unique contribution of a new independent variable when explaining variance in a dependent variable (Field, 2013), we adapted this approach to explore the unique contribution of the IHBS measure in affective components of subjective well-being.

The results of the regression analysis showed (see Table 9) that the positive affect at Time 1 predicted the positive affect at Time 2 (F [1, 102] = 49.12, R = .57, R^2 = .33, adj R^2 = .32, p < .001) and that the negative affect at Time 1 predicted the negative affect at Time 2 (F [1, 102] = 70.82, R = .64, R^2 = .41, adj R^2 = .41, p < .001). The inclusion of

the irrational happiness beliefs in Step 2 did not contribute to significant R^2 changes neither in relation to positive affect or negative affect at Time 2 (ΔR^2 = .000 for the positive affect and ΔR^2 = .004 for the negative affect). These results seem to suggest that the predictive ability of irrational happiness beliefs did not occur on subjective well-being over time after controlling for the corresponding components of affect at Time 1.

Table 9. Regression analysis with Positive Affect and Negative Affect at Time 2 used as dependent variables

	B	SE	β	*t*	*Sig.*	R^2	ΔR^2
Positive Affect Time 2							
Step 1						0.33	0.33**
Positive affect-T1	0.58	0.08	0.57	7.01	0.00		
Step 2						0.33	0.00
Positive affect-T1	0.59	0.09	0.58	6.82	0.00		
Irrational happiness beliefs-T1	0.03	0.12	0.02	0.24	0.81		
Negative Affect Time 2							
Step 1						0.41	0.41**
Negative affect T1	0.68	0.08	0.64	8.42	0.00		
Step 2	4.04	1.87		2.16	0.03	0.42	0.00
Negative affect-T1	0.67	0.08	0.63	8.20	0.00		
Irrational happiness beliefs-T1	0.07	0.09	0.06	0.81	0.42		

Note. ** $p < .001$, SE = standard error

Discussion

The aim of the present study was twofold; (i) to provide evidence of the test-retest reliability for the irrational happiness beliefs measure and, (ii) to examine the contribution of irrational happiness beliefs towards the affective components of subjective well-being, namely positive affect and negative affect, over time. The results of the correlational analysis revealed a negative relationship between irrational happiness beliefs and positive affect at Time 1, but not with negative affect. The emerging relationships did not reach a significance level at Time 2 despite the expected correlational patterns. This suggests that individuals who score highly on irrational happiness beliefs are more likely to experience less positive affect, but not necessarily negative affect. Notably, the negative correlation between irrational happiness beliefs and positive affect is consistent with the theoretical assumption of irrational happiness beliefs. With regards to the test-retest reliability, the irrational happiness beliefs measure produced good evidence of the test-retest reliability with a correlation coefficient of .72 between Time 1 and Time 2, thus suggesting that the measure can produce the same results over time.

As for the regression analysis, this study failed to provide evidence of the direct effect of irrational happiness beliefs on positive affect and negative affect over time. There could be a number of explanations as to these results. The first explanation could be attributed to methodological issues, as may invoke the occurrence of the relationships between irrational happiness and subjective well-being. For example, as the relationships between irrational happiness beliefs and positive affect occurred at Time 1 but not at Time 2, this may signify that the selected time interval (of 3 months) for the current study could be too long to manifest the effect of irrational happiness beliefs on the affective components of subjective well-being. In other words, the effect may disappear over a certain period of time and thus it is possible that the effect could be manifested when the

time interval is shorter than 3 months. It would therefore be beneficial to explore this effect by applying a shorter time interval. There seems to be a definite need to investigate the momentary effect of irrational happiness beliefs on emotion regulation and, hence, further studies should investigate the role of irrational happiness beliefs within a context in which momentary affects or emotions are present. The second explanation could relate to the complexity of the relationship held between irrational happiness beliefs and well-being as the relationships between irrational happiness beliefs and subjective well-being could be much more complex than simple direct prediction. There may be other factors which affect the relationships between irrational happiness beliefs and well-being over time and thus a mediational design is needed to address this problem. The third explanation could relate to the nature of irrational happiness beliefs, as may not be viewed as a factor that influences subjective well-being over time or a long-lasting psychological characteristic. Instead, irrational happiness beliefs may be viewed as a factor that influences subjective well-being or emotional regulation over a short time-period. Its impact upon well-being may occur momentarily and not over time.

The present research includes several limitations that should be taken into consideration when the results are evaluated. Firstly, the participants consisted solely of university students, with this somewhat limiting the generalisability of the results to other samples. The sample size of the present study was also relatively small, as limits the statistical power of detecting a small correlation. Furthermore, the emerging findings may differ across other samples. To address this issue, these findings should be replicated on different and large samples (such as with adults and adolescents) to identify robust relationships among the variables examined in this research. Secondly, as the study was longitudinal in nature, we avoided the use of definitive statements as to causality. It would therefore be valuable to explore the causal relationship among the constructs examined

in the present research. As such, further research should be conducted in order to gain a wider understanding of directionality among the variables – including in relation to employing an experimental research design as to the causality among the variables. Thirdly, the data in this study was self-reported. The use of different methods via objective measures (such as heart rate and skin conductance response) may be helpful in decreasing the limitations as to the subjectivity of the results, with self-report data being largely criticised in the literature in relation to self-report questionnaires potentially invoking social desirability and self-deception issues (Malkoç & Yalçin, 2015). As such, it is possible that issues with the self-report scales employed could have affected the responses of the participants in the present study. Finally, we have selected a time interval of *the past month* for which affect was reported on the PANAS. None of the other study variables were treated for such a restricted time interval and thus it is possible that the relationships among the study variables could have been different if the PANAS had been provided with instructions to report emotions on a global level without a restricted time interval.

Chapter Five

Examining Irrational Happiness Beliefs within an Adaptation-Continuum Model of Personality and Coping

Abstract

The integration of dispositional characteristics of personality and coping as part of an adaptation-continuum model has become a focal point in recent studies. The model has been used to provide a context in which to understand the factors related to human health and well-being. The present study sought to investigate the position of irrational happiness beliefs within the adaptation continuum model by integrating Gray's model of personality and Ferguson's model of coping strategies. A total of 166 adults (mean age = 39.48, *SD* = 11.32), as recruited via Amazon's Mechanical Turk in the United States, participated in the study. All the participants completed measures of irrational happiness beliefs, the Behavioural Inhibition System (BIS), the Behavioural Activation System (BAS) and functional dimensional coping. The results showed approach, emotional regulation and reappraisal copings and BAS personality loaded together to form the BAS-Coping factor, while avoidance coping and BIS personality loaded together to constitute the BIS-Coping factor. The results also showed that irrational happiness beliefs significantly correlated with BAS-Coping. This suggests that the combination of personality and coping is a useful context for both researchers and practitioners in understanding irrational happiness beliefs as part of an adaptation-continuum model of personality and coping.

Introduction

Researchers have recently begun to investigate operational ways of integrating personality and coping models and their application in understanding human health and well-being. There is a growing body of literature suggesting that coping strategies can be structurally examined within the extant models of personality as part of an adaptation continuum model. According to the adaptation continuum model, personality and coping structurally overlap with one another to a certain extent, thus presenting a broader taxonomy of trait characteristics (Costa, Somerfield & McCrae, 1996; Ferguson, 2001; Watson & Hubbard, 1996).

Examination of the relationship between coping and personality can be mainly grouped into different approaches (Watson & Hubbard, 1996). The first approach here is relatively used to explore the relationship between personality domains and situational coping strategies, while the second approach is used to examine trait coping behaviours concerning various models of personality as aim to present a broad taxonomy of dispositional characteristics. In the latter approach, as is focussed upon in the present paper, researchers have attempted to provide a context in which the integration of personality and dispositional coping behaviours is simultaneously considered in the investigation as to the relationship between personality coping-related constructs (such as forgiveness and celebrity worship) in understanding mental health (Maltby, Day & Barber, 2004; Maltby et al., 2004).

The evidence as to the integration of personality and coping strategies theories from a dispositional perspective predominantly suggests that personality and coping share some conceptual links (Ferguson, 2001; Maltby, Day & Barber, 2004; Maltby *et al*., 2004; Suls, David & Harvey, 1996). As a result of this link, personality and coping

can be integrated to present a context in which to understand the factors associated with well-being and mental health.

Consideration of personality characteristics and coping strategies are of interest in Mental Health Psychology. In using Eysenck's three-factor biological model of personality (Eysenck, Eysenck & Barrett, 1985) – as consists of neuroticism, extraversion and psychoticism – Ferguson (2001) attempted to map this personality model onto Carver's dispositional COPE model (Carver *et al*., 1989) by using exploratory factor analysis. Ferguson's findings suggested that personality and coping were conceptually associated with each other. By combining these two dispositional models, as are relatively stable over time and as are consistent across situation patterns of human characteristics, Ferguson's findings revealed a four-factor model. Three of these factors were directly linked to personality by including both personality domains and coping behaviours while the remaining factor comprised solely of coping behaviours. The emerging factors were named as COPE-neuroticism-introvert with a coping behaviours trait (like mental and behavioural disengagement), COPE-extraversion with a coping behaviours trait (like emotional and social support) and COPE-psychoticism with a coping behaviours trait (like alcohol and drug use). In light of Ferguson's (2001) findings, Maltby, Day and Barber (2004) subsequently attempted to provide a context in which to examine the relationship between forgiveness and mental health by applying the adaptation-continuum model of personality. The findings of Maltby et al. (2004) suggested that measures of forgiveness could be conceptualised within the adaptation-continuum model of personality as the neuroticism-coping-forgiveness factor was negatively related to mental health while the extraversion-coping-forgiveness factor was positively associated with mental health. In another study in which the relationship between celebrity worship and mental health was examined, Maltby *et al.* (2004)

suggested that integrating personality and coping models is a meaningful structural context in which to place the celebrity worship construct for understanding the relationship between celebrity worship and mental health.

Further evidence supports the usefulness of the adaptation-continuum model of personality in relation to the conceptual links between personality characteristics and coping strategies. For example, in a meta-analysis study, Connor-Smith and Flachsbart (2007) attempted to combine the Big Five personality traits and coping responses by using data from 165 samples with a total of 33,094 participants including children, adolescents and adults. Here, a modest relationship between personality and coping was found by noting that this relation can be affected by the severity of stressors, application of coping measures timeframes and demographic factors. In corresponding with the particular domains of personality and coping, the analysis revealed that all domains of personality significantly predicted specific strategies. For example, extravert and conscientious individuals typically use more potentially-effective problem-focused coping strategies (including cognitive restructuring, problem solving and seeking support), while neurotic individuals largely use less potentially-effective emotion-focused coping strategies comprising of wishful thinking, withdrawal and denial.

In the present study, we attempted to understand irrational happiness beliefs within the adaptation continuum model. Unlike the extant literature in which the Big Five personality model or Eysenck's model of personality and Carver's dispositional COPE model have been commonly employed, we used a relatively different model of personality and coping due to the expected theoretical relevance with irrational happiness beliefs. In regards to personality theory, we employed Reinforcement Sensitivity Theory, a neurobiological theory of personality by Gray (1970; 1987), as holds that individual behaviours are governed by two general motivational systems – the Behavioural

Inhibition System (BIS) and the Behavioural Activation System (BAS). The BIS includes aversive motives in which the goal is to avoid unpleasant stimuli (e.g., I feel worried when I think I have done poorly at something important), with this system being sensitive to signals of punishment. The BAS includes predisposition toward rewarding motives in which the goal is to approach pleasant stimuli (e.g., If I see a chance to get something I want I move on it right away), with this system being sensitive to signals of rewards. Methodologically, these two systems are best represented and measured with the BIS/BAS Scale proposed by Carver and White (1994). Studies which have used the BIS/BAS Scale have indicated that the BAS explains significant positive unique variance in positive affect and satisfaction with life and significant negative unique variance in negative affect, while the BIS explains significant negative unique variance in negative affect (Gill, Kane & Mazzucchelli, 2017).

With respect to coping, we considered the Functional Dimensional Coping model (FDC; Ferguson & Cox, 1997; Ferguson, 2001) as it characterises the coping function as transactional. The FDC assumes that there are particular coping functions that individuals use to define themselves in terms of what functions they believe their coping behaviours perform. When individuals encounter stressful situations, they typically use four coping functions; approach, avoidance, reappraisal and emotional regulation. While the approach function allows individuals to interpret behaviours from a perspective of direct problem-solving, the avoidance function refers to an interpretation of behaviours in terms of the individual avoiding the opportunity to deal directly with stressful demands or ignoring/denying the existence of the situation. The reappraisal function, in contrast, refers to an interpretation of behaviour as regards the readdressing and reinterpreting of the nature of a stressor by changing the way an individual thinks and perceives, while the emotional regulation function presents individuals interpreting behaviours in relation to

their perceived ability to cope with the emotional outcomes of a stressor (Ferguson & Cox, 1997; Ferguson, 2001). In using the FDC Scale, studies have indicated that approach, reappraisal and emotional regulation coping are positively related with extraversion and, furthermore, are negatively related with neuroticism and psychoticism. Avoidance coping was found to be positively related with neuroticism and psychoticism and negatively related with extraversion (Ferguson, 2001).

Present Study

Considering that the links between personality and coping have been mainly studied through correlational analysis, the employment of an exploratory factor analysis approach may be helpful in further clarifying the overall pattern of the relationships that simultaneously arise between personality and coping. The emerging pattern may offer a useful context for examining the relationship between personality-related coping and irrational happiness. Therefore, in keeping with the literature, we focused on incorporating personality and coping factors due to their potential theoretical overlaps (Maltby, Day & Macaskill, 2010), to understand the theoretical conceptualisation of irrational happiness beliefs. This is worthwhile in understanding the concept of irrational happiness beliefs, particularly within the concepts of the relatively stable aspects of personality and coping strategies. Maltby *et al*. (2010) suggested that maladaptive personality traits (such as neuroticism) share variances with emotion-focused coping strategies as neurotic individuals show tendencies towards focusing on their emotions when coping with stressful situations due to them being anxious and worried. In contrast, adaptive personality traits (such as extraversion) overlap with problem-focused coping strategies as extravert individuals show tendencies towards explicitly coping with stress due to the belief that they can tackle this with stress. Following the assumption of Maltby *et al*. (2010), we examined how the combination of maladaptive aspects of personality

and coping strategies and the adaptive aspects of personality and coping strategies work together in explaining irrational happiness beliefs. This, in turn, provides a foundation for gaining a better understanding of the underlying relationships between these variables.

It is important to note that by integrating personality and coping strategies, we do not assume that these two constructs assess the same thing. Instead, it is noted that there are intrinsic structural and conceptual overlaps between these two dispositional models. As a consequence, the present study aimed at examining; (1) how two general motivational systems of Gray's model of personality individually overlap with Ferguson and Cox's functional dimensions of coping model using exploratory factor analysis and, (2) how the application of an integrated personality and coping model would simplify the relationships between personality-related coping and irrational happiness beliefs. To this end, we first examined the structural similarities between personality and coping strategies by using an exploratory factor analysis recommended by Deary, Clyde and Frier (1997). We then correlated the resultant findings with irrational happiness.

Method

Participants

The 166 adult participants, as comprised of 94 (56.6 %) females and 72 (43.4 %) males whose ages ranged from 20 to 60 with a mean age of 39.48 (*SD* = 11.32), were recruited from the United States via the Amazon Mechanical Turk (MTurk) website. Due to the requirements of MTurk, only those residing in the United States could participate in the study. Of these participants, the majority of the participants (61.4%) reported as being married, while 28.3% reported being single and 9% denoted that they are divorced. The most reported ethnicity was Caucasian (83.1%) with the next highest frequencies

being Black (6.6%) and East Asian (4.2%). With regard to religion, the participants were predominantly Christian (63.9%) followed by those with no religious beliefs (29.5%) and Buddhist (2.4%).

Measures

Irrational Happiness Beliefs was measured with the Irrational Happiness Beliefs Scale developed in previous chapters. This scale explicitly reflects Albert Ellis' musturbatory model within Rational Emotive Behavioural Therapy (Ellis, 2004; 1991; 1987). The scale consists of 3 items where respondents rated their level of agreement and disagreement with each item on a 7-point Likert type ranging from *strongly disagree* (1) to *strongly agree* (7). A sample item is "I should always be happy in all aspects of my life." The scale score is the sum of the items on the scale, with higher scores indicating a higher level of irrational happiness beliefs. In this study, the internal consistency reliability of the scale was .91.

The Behavioural Inhibition System and Behavioural Activation System Scale (BIS, Carver & White, 1994) is a 24-item self-report scale designed to measure Gray's model of personality. This model is a bio-psychological model of personality in which the Behavioural Inhibition System (BIS) and the Behavioural Activation System (BAS) govern individual behaviours. Here, the BIS comprises 7 items as measure aversive motives, in which the goal is to avoid unpleasant stimuli, while the BAS includes 13 items as it measures the disposition of individuals towards rewarding motives in which the goal is to approach pleasant stimuli. The BAS is split into BAS reward responsiveness (5 items), BAS drive (4 items) and BAS fun seeking (4 items) subscales. The scale also includes 4-filler items in order to reduce subject-related bias. For this study, we computed an overall score for the BAS by summing all scores on each of the subscales. The

respondents rated each of the items on a scale ranging from *very true for me* (1) to *very false for me* (4). In the original article, Carver & White (1994) reported satisfactory internal consistency for all of the subscales (BIS $\alpha = 0.74$; BAS reward $\alpha = 0.73$; BAS drive $\alpha = 0.76$ and BAS fun seeking $\alpha = 0.66$) and a two-month test-retest reliability where the r's ranged from .59 to .69. Carver & White (1994) also established the validity of the measure by showing that the BAS sensitivity predicted increased happiness when a reward was expected, whereas BIS sensitivity predicted increased nervousness when punishment was expected.

The Functional Dimensions of Coping Scale (FDC, Ferguson & Cox, 1997), is a scale, which assesses situation-specific coping strategies via both qualitative and quantitative parts. In the qualitative parts, participants were asked to specify a particular situation or event that they had experienced within the last three months and then to indicate, in the quantitative part, how they dealt with the stress resulting from that situation or event. In the quantitative part, the FDC includes 16 items whereby the participants rate each of the items to present the function of their coping style. These 16 items are split into four dimensions; approach, avoidance, emotional regulation and reappraisal. The participants rated their response with each item on a 7-point response format, as ranged from *not at all* (0) to *very much so* (6). The subscale scores are the sum of the items on the respective subscales, with higher scores representing a high level of the coping function.

Procedure

A questionnaire battery was created via external secure software by including the above-mentioned questionnaires. A link was created on that external software and the link was then posted on Amazon's Mechanical Turk, as is known as MTurk. This is an

online labour market where researchers promote their behavioural research and workers choose which research to participate in for exchange of payment (Mason & Suri, 2012). This platform has a number of advantages for researchers in their conducting of research –including in relation to having ease of access to a large and diverse subject pool with a low cost implication (Mason & Suri, 2012). Respondents were asked to complete a set of self-report measures, as described above. Participation in the study was voluntary and those who agreed to contribute to the study were paid £0.50 as an incentive on their successful completion of the questionnaires. Completion of the questionnaire battery was undertaken in the same order for all of the participants.

The data collection procedures received ethical approval from the University of Leicester's Department of Neuroscience, Psychology & Behaviour Ethics Board. Participants gave their consent electronically via the MTurk system after receiving the necessary information as to the nature of the study. The information consisted of statements regarding anonymity assurance, confidentiality provisions and the rights of participants to opt out of the study.

Data Analysis

Prior to undertaking the main analysis, preliminary analysis was carried out in order to investigate whether there were any missing values in the dataset, with no missing values subsequently being found. The *Z* statistic was used to determine the univariate outliers, whereupon two cases were found and removed from the analysis due to their exceeding of the threshold *Z* values of -3.29 and +3.29. In using the Mahalanobis distance, two cases were detected as multivariate outliers and were removed (Tabachnick & Fidell, 2001). Exploratory and confirmatory factor analyses were conducted to determine the underlying factor structure of personality and coping. The Pearson

moments product correlation coefficient was then used to assess the correlations among the study variables. Cronbach alpha coefficient was used to evaluate the internal consistency reliability for each scale. All of the analysis was performed using SPSS 24 for Windows. Finally, the skewness and kurtosis statistics were computed with the intention of identifying the distribution of the data.

Results

Table 10 presents the minimums, maximums, means, standard deviations, skewness and kurtosis statistics with the respective standard error values for the study variables. To test the normal distribution of the variables, we adapted the skewness and kurtosis statistics whose values varied between |1| and |2|, as signify "very good" and "acceptable" respectively, while values greater than |2| and |7| signify "concern" for the normal distribution (Curran, West & Finch, 1996; George & Mallery, 2010). As seen in Table 10, all of the skewness and kurtosis values fell within the "very good" and "acceptable" range (skewness = 0.02 and -0.99; kurtosis = 0.12 and 1.29), with this suggesting that the deviation from normality is not a serious issue. Hence, parametric tests are appropriate for the analysis.

The next step of analysis was to identify the factor structure of the coping and personality measures. To achieve this, the subscales of functional dimensional coping and BIS/BAS personality were simultaneously subjected to principal component analysis by using exploratory factor analysis (EFA). As personality and coping factors were expected to be correlated to some extent, an oblique rotation with the delta set to zero was performed for the factor analysis. In doing so, we intended to uncover the underlying common variance among the subscales loaded on their respective factors. Furthermore, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO = .62) and Bartlett's Test

of Sphericity (x^2 = 278.746, df = 15, p < .001) demonstrated that this data set was suitable for performing factor analysis.

Table 10. Descriptive statistics for the study variables

	Min	Max	Mean	*SD*	Skewness		Kurtosis	
					Statistic	*SE*	Statistic	*SE*
Irrational happiness beliefs	3.00	21.00	12.84	4.67	-0.48	0.19	-0.70	0.37
Approach coping	0.00	24.00	14.86	5.92	-0.48	0.19	-0.37	0.37
Avoidance coping	0.00	23.00	9.84	6.41	-0.08	0.19	-1.14	0.37
Emotional regulation coping	1.00	18.00	13.31	3.58	-0.99	0.19	1.29	0.37
Reappraisal coping	0.00	30.00	18.61	7.39	-0.62	0.19	0.13	0.37
BAS total	18.00	51.00	37.58	6.27	-0.08	0.19	0.12	0.37
BIS total	7.00	28.00	19.91	5.04	-0.57	0.19	0.22	0.37
BAS drive	4.00	16.00	10.78	2.65	-0.11	0.19	-0.31	0.37
BAS fun seeking	4.00	16.00	10.37	2.60	0.02	0.19	-0.71	0.37
BAS reward responsiveness	9.00	20.00	16.43	2.64	-0.47	0.19	-0.26	0.37

Note. *SD* = standard deviation, *SE* = standard error

In exploratory factor analysis, deciding the number of factors to retain is important and is typically reached at based on several criteria. We adapted the Eigenvalue greater than one method or K1 (Kaiser, 1960), Scree Plot (Cattell, 1966) and parallel analysis of the Monte Carlo simulations (Horn, 1965) to identify the number of factors to retain. The analysis showed that the first factor produced an Eigenvalue of 2.41 by explaining 40.16 % of the variance, while the second factor produced an Eigenvalue of

1.23 by explaining 20.49 % of the variance. Both a scree test and parallel analysis confirmed the results of the K1 procedure. Only the eigenvalues from the first two factors (2.41, 1.23) produced from the actual dataset through exploratory factor analysis were greater than the eigenvalues (1.26, 1.13) derived from 1,000 generated random sets of data with 164 subjects and 6 variables through parallel analysis.

Table 11. Principal Components Analysis and reliability statistics of the FDC and BIS/BAS factors with direct oblique rotation

		Factors	
	α	Factor 1	Factor 2
FDC factors			
Approach coping	.85	**0.84**	-0.29
Emotional regulation coping	.86	**0.79**	0.08
Reappraisal coping	.88	**0.90**	-0.02
Avoidance coping	.83	0.12	**0.82**
BIS/BAS factors			
BIS	.88	-0.27	**0.58**
BAS	.86	**0.43**	0.38

Table 11 presents the reliability statistics and factor loadings that emerged through principal component analysis with rotated oblique solution with Kaiser Normalization for the Functional Dimensions Coping and BIS/BAS measures. In terms of assessing a minimum factor loading for each of the items, correlations around .32 and above were used as a definitive guide for retention, with this having been recommended by Tabachnick and Fidell (2001). If the loadings are above .32, as is equivalent to a 10%

(or more) overlap in variance among the factors, the oblique rotation is thus warranted for the adequate variance. However, in relation to the BAS cross-loaded with both factor 1 and factor 2 with loadings of above .32, we adapted a different significant loading criterion with a cut off value of .40 based on pragmatic reasoning (Yong & Pearce, 2013). Adapting this procedure could also allow us to solve the complexity of the rotated factor solution. In this respect, the first resulting factor clearly reflects the adaptive characteristics of personality and coping, with the measures of approach, emotional regulation and reappraisal coping and measure of BAS personality all loading positively. Here, reappraisal coping was found to be the highest loading on this factor. This factor was therefore termed as adaptive BAS-Coping. The second resulting factor represents the maladaptive aspects of personality and coping, with avoidance coping being the highest positive loading on this factor alongside the measure of BIS personality with positively loading. This factor can be termed as maladaptive BIS-Coping. The factor loadings ranged between .43 and .90. As noted above, the BAS subscale shows some degree of positive cross-loading on factor two. However, it fails to exceed the minimum loading criterion of .40 and was thus loaded on factor 1.

Table 12. Correlations between BAS- Coping, BIS- Coping, and Irrational Happiness Beliefs

	1	2	3
1. Irrational happiness beliefs	1		
2. BAS Coping	.43**	1	
3. BIS Coping	0.10	-0.05	1

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

Table 11 also presents Cronbach's alpha internal reliability statistic for all of the subscales used in this study. As seen in Table 11, the Cronbach's alpha coefficient was

high due to it exceeding the internal reliability criterion of $\alpha > 0.7$ as good (Kline, 2000). It can be concluded that items on the respective subscales were internally consistent with each other.

Following the determination of the factor structure of the coping and personality measures, we then computed factor scores for each of the factors emerging through the principal component analysis shown in Table 11. Furthermore, we estimated the Pearson correlation among the variables by using the new computed factor scores. Table 12 shows the zero-order correlations between BAS-Coping, BIS-Coping and irrational happiness beliefs. As seen in Table 12, irrational happiness beliefs shared a significant positive association with BAS-Coping. Although the correlation between BAS-Coping and BIS-Coping was in the expected direction, the emerging correlation did not reach a significant result.

Discussion

Researchers have begun to study personality and coping strategies under the adaptional continuum model (Watson & Hubbard, 1996), doing so in order to clarify the conceptual link between the two and the constructs that are associated with personality and coping strategies (Ferguson, 2001; Maltby, Day & Barber, 2004; Maltby *et al*., 2004). This study sought to investigate (a) whether Gray's model of personality can be integrated with the Functional Dimensions of Coping Model as part of an adaptional continuum model and, (b) how irrational happiness beliefs can be applied to the integration of these two models, undertaken with the purpose of simplifying the relationships between the personality-coping variables and irrational happiness beliefs.

In relation to the first aim, the results show that the adaptive aspects of Gray's model of personality are meaningfully arranged around the adaptive components of

functional dimensions of coping, while the maladaptive components of personality are meaningfully arranged around the maladaptive components of coping strategies. In particular, three aspects of coping strategies (approach coping, emotional regulation coping and reappraisal coping) and the BAS aspect of personality loaded together to form the BAS-Coping factor, while the avoidance aspect of coping strategies and the BIS aspect of personality loaded together to constitute the BIS-Coping factor. Although the present study used different models of personality and coping, these findings were consistent with the previous research as has indicated that, because of the conceptual link, personality and coping can be integrated to offer a context in which personality-coping related constructs can be examined easily as part of an adaptional-continuum model (Ferguson, 2001; Maltby & Day; Maltby, Day & Barber, 2004; Maltby *et al*., 2004; Watson & Hubbard, 1996).

For the second aim, these emerging results provide a useful foundation for understanding irrational happiness beliefs within the context of an adaptational-continuum model of personality and coping. In light of the integrating personality and coping strategies findings (Ferguson, 2001; Maltby, Day & Barber, 2004; Maltby *et al*., 2004), we found that irrational happiness beliefs significantly correlated with BAS-Coping. That is, people who hold irrational happiness beliefs can be best described as being sensitive to signals of reward by showing disposition personality characteristics towards approaching pleasant stimuli and dealing with stressful events by approaching, regulating emotion and reappraising events.

The present findings are important in terms of providing support for the integration of personality and coping strategies. The study expands upon the body of knowledge held as to the adaptational-continuum model of personality and coping by supporting a model which, when examining personality and coping strategies together, is

useful when considering the conceptual links between the two constructs together. Most importantly, the results of the present study highlight one way in which irrational happiness can be situated within a personality-coping model. By successfully showing that a particular domain of coping strategies can be structurally integrated with a particular domain of personality and that irrational happiness can be located within this integration, we can suggest that the findings are particularly useful for health professionals interested in measuring the irrational happiness beliefs of clients. As Ferguson (2001) argued, understanding personality-related coping behaviours allows health psychologists to better interpret findings and to offer useful advice. Within the context of irrational happiness beliefs, such knowledge allows health professionals to better understand such beliefs within the wider context of personality and coping psychology.

Although the sample of this study consisted of participants from various socio-demographic backgrounds in the United States, the study poses limitations in generalising its findings to other cultures and samples. As such, there is a need for studies with diverse populations and cultures. Another limitation of this study is that the obtained findings rest on data from one time-point, with it thus being difficult to draw any conclusions as to causality. Subsequent research should examine the position of irrational happiness beliefs within the personality-coping model by using a longitudinal design. It would then be plausible to conclude whether higher levels of BAS-Coping strategies are associated with increases in irrational happiness beliefs over time or whether higher levels of irrational happiness beliefs are associated with increases in BAS-Coping strategies over time.

In conclusion, this study has shown that personality and coping strategies can be successfully integrated to present a context in which irrational happiness beliefs can be

examined. Adaptive aspects of personality grouped with adaptive aspects of coping strategies while maladaptive aspects of personality grouped with maladaptive aspects of coping strategies. Irrational happiness beliefs was found to be positively correlated with BAS Coping.

Chapter Six

The Effect of Irrational Happiness Beliefs on Pain Arousal Using the Cold Pressor Task

Abstract

The aim of this study was to examine whether there was an association between irrational happiness beliefs and pain arousal in a UK sample of 45 healthy participants (41 females and 4 males). These participants ranged in age between 18 and 47 (mean age = 20.45, *SD* = 4.53). Of the participants, 25 were randomly assigned to the experimental group, while 20 participants were assigned to the control group. Pain induction was employed using the Cold Pressor Task (CPT), while pain experience was measured by means of physiological (skin conductance response and heart rate) and psychological (self-report irrational happiness beliefs, trait-state anxiety scales, pain threshold and tolerance) measurements. The physiological responses of the participants were measured before and during pain induction. The results show that irrational happiness beliefs had a medium effect in changes of heart rate and skin conductance response as a result of the CPT. The results also show that although it was not significant, a positive pattern was observed between irrational happiness beliefs and pain threshold and tolerance. The importance of the results as related to pain arousal and the related literature are also discussed in this chapter.

Introduction

Happiness is mostly based on eliminating *pain and displeasure* to free people in seeking engagement and meaning. Pleasure is a critical ingredient of happiness in terms of providing many opportunities to individuals for positive human functioning (such as engagement in social interactions), while displeasure is a critical factor in which it leads to numerous mental health problems such as depression (Kringelbach & Berridge, 2010). Individuals vary in their experience of pain and displeasures or discomfort. A certain number of factors have been identified as being sources of this variability. The literature as to pain indicates that a person's pain response levels are governed by genetics (Young, Lariviere & Belfer, 2012), environmental factors (e.g., emotional states, stress) and personality traits (Vassend, Røysamb & Nielsen, 2013).

A number of studies have examined individual differences in important psychological characteristics (e.g., hope, optimism and stress) in terms of their relationships with pain experience, arousal, threshold, intensity and tolerance within experimental settings. Research as to the positive psychological constructs has indicated that hope and optimism are negatively correlated with pain catastrophising and pain (Berg, Snyder & Hamilton, 2008; Hood, Pulvers, Carrillo, Merchant & Thomas, 2012). For example, Hood *et al*. (2012) indicated that pain catastrophising mediated both the relationship between trait hope and pain dispositional optimism and pain report. In another study, in which the effect of mindfulness on pain tolerance was examined, the findings showed that training the mind may assist in enhancing pain tolerance (Hayes, Bissett, Korn & Zettle, 1999), increasing quality of life and decreasing stress symptoms (Carlson, Speca, Patel & Goodey, 2004). Lu, Tsao, Myers, Kim and Zeltzer (2007), in producing an experiment with 244 healthy children and adolescents designed to investigate the predictor role of coping strategies indicators with pain responses

(including pain tolerance, intensity and unpleasantness), indicated that higher pain intensity was predicted by catastrophising, while lower pressure pain tolerance was predicted by the seeking of emotional support. Furthermore, positive self-statements predicted lower pressure pain intensity and lower cold pain intensity and unpleasantness, while behavioural distractions predicted higher-pressure pain tolerance and lower heat pain unpleasantness. These findings suggest that within laboratory settings (e.g., the Cold Pressor Task), the conceptualisation of catastrophising and the seeking of emotional support might be understood as pain-prone coping strategies, while the conceptualisation of positive self-statements and behavioural distraction might be understood as pain-resistant coping strategies. On the other hand, studies as to the negative psychological constructs and their relationships with pain experience have demonstrated how higher pain experience is related to higher anxiety sensitivity (Keogh & Birkby, 1999; Keogh & Mansoor, 2001), anger suppression (Burns, Quartana & Bruehl, 2007; Quartana, Yoon & Burns, 2007), stress, anxiety and depression (Keogh & Mansoor, 2001).

There are many studies, which have indicated that the Cold Pressor Task is relatively less harmless for acute pain induction when compared with other methods. In a review study by von Baeyer, Piira, Chambers, Trapanotto and Zeltzer (2005), it was suggested that the Cold Pressor Task, as a method of inducing acute pain, is a non-harmful and innocuous method when compared to other experimental pain-inducing techniques (such as electric shocks being administered). It is also advantageous over other acute pain-indication techniques in regards to enabling people to have control over their exposure to the stimulus in an attempt to withdraw their hand from the water once the discomfort is unbearable and, in addition, to the discomfort pertaining to the cold water and this quickly disappearing when the hand is removed (Edens & Gil, 1995).

Present Study

As reviewed above, some studies have investigated the relationship between positive and negative psychological constructs and pain arousal within experimental settings. In light of the previous findings as to pain arousal, it would be useful to investigate the effect of irrational happiness beliefs on pain arousal within the cold pressor paradigm. In considering the theoretical assumption of irrational happiness beliefs, it is plausible to locate irrational happiness beliefs within the context of pain arousal. Notably, the irrational happiness beliefs construct proposes that the main characteristics of people with higher irrational happiness beliefs is their constant seeking of pleasure and avoiding of pain in order to maximise their happiness. Due to these characteristics, people with high levels of irrational happiness beliefs may cope with physical discomfort ineffectively. That is, they are less likely to have skills pertaining to the tolerance of physical and emotional pain. From this viewpoint, the examination of the relationship between momentary-induced pain and irrational happiness beliefs may thus be worthwhile. This relationship would provide evidence through which we could gain a strong understanding as to the underlying mechanism between irrational happiness beliefs and pain induced through physical discomfort. In the present study, we hypothesised that higher irrational happiness beliefs would be associated with a lower pain threshold and lower tolerance. We also hypothesised that a higher level of irrational happiness beliefs would have an effect upon the arousal witnessed in relation to the cardiovascular system and electrodermal activity. This is because people with irrational happiness beliefs may mainly seek pleasure and attempt to distance themselves from negative outcomes (e.g., pain) when compared to people without such beliefs.

Method

Participants

The sample included 45 undergraduate university students enrolled in Psychology courses at the University of Leicester. Of the participants, 25 were randomly allocated to the experimental condition (age range 18–47, mean age = 20.72, *SD* = 0.33), while 20 were allocated to the control condition (age range 18–27, mean age = 20.20, *SD* = 1.96). Among the participants, 41 were females and 4 were males. 21 of the participants self-identified themselves as Caucasian, 20 as Asian and 4 as another ethnicity. With regards to religion, the sample was predominantly Christian (*n* = 18), with 14 of the sample reporting themselves as having no religion, 6 as Muslim, 3 as Hindu and 4 as being affiliated to another religion. Prior to starting the experiment, all participants signed informed consent forms and thus indicated that they were fully aware of the pain manipulation task and their explicit agreement to partake in the study. The participants further completed a medical history screening form before proceeding with the task. All participants were given course credits for taking part in the experiment.

Measures

Self-Report Measures

Irrational Happiness Beliefs (IHB). The scale is a 3-item self-report scale that measures the conditional aspect of happiness. Participants were asked to indicate their agreement and disagreement on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The total score is the sum of the items, with higher scores indicating possession of a higher level of irrational happiness beliefs. In the present study, the Cronbach alpha coefficient was .83.

State-Trait Anxiety Inventory (STAI, Spiegelberger, Gorsuch & Lushene, 1970), as is a self-report questionnaire that assesses adult anxiety levels by focusing predominantly on worry, tension, nervousness and apprehension, includes two subscales with 20 items per subscale. These scales are state anxiety (a temporary state experienced in particular situations) and trait anxiety (a general inclination to perceive situations as threatening). The participants rated each of the items on a 4-point scale, as offered "1 (*not at all*)", "2 (*somewhat*)", "3 (*moderately so*)" and "4 (*very much so*)." After reversing the scores for the positively-worded items, the total scores for the state and trait anxiety are the sum of the items on the respective subscales, with higher scores indicating a higher level of anxiety. In the present study, the Cronbach alpha coefficient was .90 for state anxiety and .86 for trait anxiety.

Physiological Measures

We used two sets of measures to continuously monitor and record cardiovascular and electrodermal activities. For the cardiovascular aspect, we used a pulse logger sensor to monitor heart rate (HR), while skin conductance response (SCR) was used to monitor electrodermal activity. The apparatus used for the SCR data collection was Neulog Galvanic Skin Response (GSR) Sensor NUL-217. The range and operation modes for this sensor are presented as microsiemens ranging between 0 and 10. SCR was recorded from the non-dominant hand via a pair of electrodes placed upon the palmar surface of the medial phalange of the middle and ring fingers. We used SCR, as sweating is an indication of arousal. Sweating on the skin presents a likelihood of increased skin conductance. That is, the presence of greater sweating refers to the presence of higher skin conductance. The apparatus used for the HR data collection was an Edu-Logger Heart Pulse Logger Sensor. The range and operation modes for this logger are presented as BPM (beats per minute) ranging from 0 to 240. HR reactivity was monitored from the

non-dominant hand by attaching the HR pulse electrodes on the palmar surface of the distal phalange of the baby finger. The electrodes were both plethysmograph-based. The data acquisition for both the HR and SCR was recorded with NeuLog Software Version 7.56.47 for Windows PCs. Both the HR and GSR Sensor were used with the Edulogger USB module.

Cold Pressor Task Apparatus

A 22-litre digital stirred stainless steel water bath (the Clifton range of water baths NE4-22D series) was used to elicit acute pain. The water baths (see Figure 3) is designed for good water circulation and temperature stability as controlled through an LCD panel. To achieve a set temperature, the Clifton range of the Immersion Dip Cooler DC Series was also used alongside the Clifton NE4-22D series to provide temperature control of the bath liquid. As a physiological pain induction technique, the Cold Pressor Task (CPT) is a safe experimental approach through which to elicit a certain level of physiological arousal. Using this approach, the participants were asked to put their dominant hand up to its wrist in the cold water for as long as they could endure (up to three minutes). As a stimulus, the cold water gradually causes a certain degree of pain intensity (e.g., moderate pain), with the CPT ending up with the voluntary removal of the hand from the water when the pain becomes intolerable (von Baeyer *et al*., 2005). Although some disadvantages of this method have been reported in prior research, particularly when it is applied to children, the CPT is a useful approach in terms of it controlling stimulus location, length and intensity (e.g., von Baeyer *et al*., 2005). This method is also harmless when compared to other pain-inducing methods (such as electric shock and tooth pulp stimulation) (von Baeyer *et al*., 2005). A good degree of reliability and validity has been indicated in this approach in relation to pain induction (Edens & Gil, 1995).

Figure 3. The Water Bath Used for Pain Induction

Procedure

Prior to the experiment, we made clear the exclusion and inclusion criteria within the University of Leicester's Experimental Participation Requirement system, as was the portal through which the participants were recruited, and these were then repeated at the time of the experiment. We detailed the possible risks and exclusion criteria by including pertinent statements – for example, if the participant is taking medication, suffering from a medical or psychiatric condition or illness, not currently signed up with a local doctor or having consumed alcohol/undertaken exercise before the experiment. The participants were asked to indicate their agreement as to each of the exclusion criteria aspects. None of the participants denoted that they met the exclusion criteria. We also included an exit questionnaire as to the participants' experience of the experiment. In that questionnaire, the participants were asked to indicate whether they felt unwell or were in pain due to their participation in the experiment or whether they had enjoyed the experiment. Furthermore, we included a protocol in which, if the participant said they felt unwell or were in pain, for example, they were to have been instructed to contact their local doctor/university medical centre.

The experiment consisted of two continuous phases. In the first phase, all of the participants completed the aforementioned self-report questionnaires. In the second

phase, the participants underwent the Cold Pressor Task. In the latter phase, the participants were asked to submerge their dominant hand in the circulating cold water for as long as they could endure. We used a time constraint of 3 minutes, whereby the participates were asked to remove their hand even if they still wanted to keep their hand in the cold water after a duration of 3 minutes. This procedure was applied to prevent any potential tissue damage that could arise as a result of immersing one's hand in the water for a long time. The participants were instructed to sit quietly on a comfortable chair for 3 minutes as they immersed a hand in the water. As their hand was in the water, they were informed that they had to immediately report the sensation transitions from the level at which the body first perceives the pain (i.e. pain threshold) as being uncomfortable. It was from this point of time that the measuring of the pain threshold was recorded. The participants were also informed that if they could no longer tolerate the pain (i.e. pain tolerance), they could withdraw their hand from the cold water immediately and did not need to wait until the end of the task. We recorded both the pain threshold and pain tolerance times of each participant, with this being measured in seconds via a digital stopwatch and outside of the participant's scope of view. Once the task was completed, they removed their hand from the water and dried their hand with a paper towel. As physiological measures, we recorded skin conductance responses and heart rate for 3 minutes from the participant's non-dominant hand before and during the Cold Pressor Task.

For the experimental condition, the temperature was set at 3 °C within the range of 2-4 centigrade for each of the participants. This was as suggested within the relevant literature to avoid variation in the water temperature and to ensure that the water temperature is enough to trigger the cold pressor responses. The participants in the control condition immersed their hand for 3 minutes in a warm water bath kept at 34 °C.

Participants were debriefed at the end of the experiment. The ethics of this experiment were reviewed and approved by the Institutional Ethic Board of the University of Leicester

Data Analysis

Prior to the main analysis being undertaken, a series of assumption analyses were performed to detect for normality, missing values, homogeneity of variance covariance matrices, linearity, sphericity and univariate and multivariate outliers. To test the assumption of normality, we used the Shapiro-Wilks test ($p > 0.5$) (Shapiro & Wilk, 1965) alongside examining the histograms, normal Q-Q plots and Box-and-Whisker plots. In regards to the self-report questionnaires, the results reveal that the IHB was not approximately normally distributed and that there was one extreme low score. To deal with this outlier, we used a robust method in providing more stable results, the *winsorized mean method,* whereby an outlier in a sample has its value transformed by replacing its original value to the nearest value of an observation not seriously considered an outlier (Tukey, 1962; Dixon, 1980). Through this method, we winsorized the case original value from 4 to the nearest value of 9. With regards to the physiological data, the SCL scores were square-root transformed as the variance increases with the mean and violates the assumptions of the parametric statistics. The analysis was performed using the transformed values instead of the original values. The Mahalanobis Distance statistic was used to identify if multivariate outliers could be found, with none subsequently being found. Furthermore, no missing value was inspected. A Pearson correlation was performed to test the multicollinearity between the dependent variables and a correlation of .42 was found between the HR and SCL scores obtained during the task. This result indicates that the multicollinearity was unlikely to be an issue as it was lower than r = .90 (Tabachnick & Fidell, 2013). Mauchly's Test of Sphericity was then calculated to test the

equality of the variance. When the MANCOVA was performed, the Greenhouse-Geisser procedure was used in order to correct the degrees of freedom of the F statistic. In respect of the homogeneity of the variance covariance matrices, the Box's M test was evaluated based on Huberty and Petoskey's (2000) guidelines where a probability *p* value greater than .005 is considered to demonstrate the covariance matrices between the groups as being assumed to be equal. To assess the magnitude of the effect, as is characterized as a proportion of the variance in the dependent variable that can be accounted for by the independent variable, we reported the partial eta-squared effect size (η_p^2) as recommended by Cohen (1988). According to Cohen's effect size criterion, variance ranging between .01 and .06 is considered to be a small effect while variance ranging between .06 and .14 and greater than .14 are characterized as denoting a moderate and large effect, respectively. The analysis of the data was performed using SPSS for Windows Version 24.

Results

Randomization Check

Twenty-five participants were randomly assigned to the experimental condition, while twenty participants were assigned to the control condition. The participants from both groups did not significantly differ from one another in the anxiety scores (see Figure 4) measured by the trait subscale of the State-Trait Anxiety Inventory, [$M_{(experimental)}$ = 41.72, SD = 7.72; $M_{(control)}$ = 40.10, SD = 8.81; t (43) = 0.657, p = 0.515].

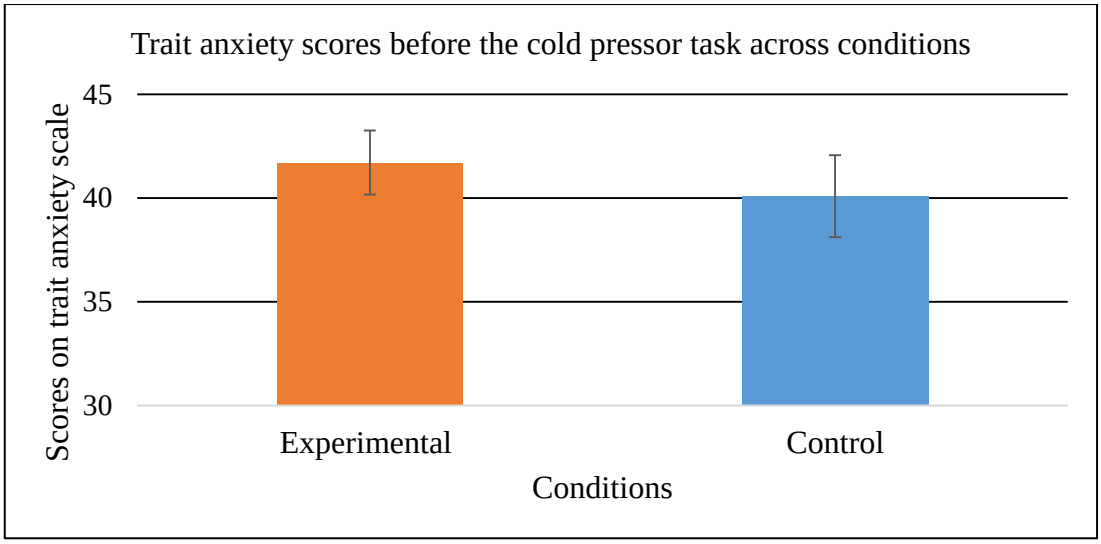

Figure 4. Trait Anxiety Scores Prior to the Cold Pressor Task across Conditions

Manipulation Checks

A 2x2 Mixed ANOVA was used to investigate the mean differences as to the heart rate values measured over time and across conditions. There was a significant main effect of time on HR, F (1, 43) = 31.38, $p < .001$, $\eta_p^2 = .42$. This effect accounted for 42% of the variance. The mean HR during the task was significantly higher than the mean HR before the task (see Table 13; Figure 4). There was also a significant interaction effect between time and conditions, F (1, 43) = 33.64, $p < .001$, $\eta_p^2 = .44$. This effect accounted for 44% of the variance. Post-hoc comparisons with the Scheffe test found that prior to the Cold Pressor Task, the participants in the experimental condition did not significantly differ from the participants in the control condition in relation to their heart rate levels (78.57 vs. 76.68 bpm, $p < .001$).

Table 13. Means and standard error of State Anxiety, Heart Rate, and Skin Conductance Response before and during the CPT across conditions

	Experimental (*n* = 25)						Control (*n* = 20)					
	State Anxiety		HR (bpm)		SCR (µS)		State Anxiety		HR (bpm)		SCR (µS)	
	M	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SD*	*M*	*SE*	*M*	*SE*
Before	33.16	1.59	78.57	2.36	1.39	0.10	31.85	1.77	76.68	2.64	1.06	0.11
During	35.04	1.41	84.32	2.39	1.53	0.11	27.65	1.58	76.58	2.67	1.02	0.12

Note. HR = heart rate, SCR = skin conductance level, CPT = cold pressor task

However, during the Cold Pressor Task, the participants in the experimental condition significantly differed from the participants in the control condition in regards to their heart rate levels (84.32 vs. 76.58 bpm, $p < .05$). This suggests that the manipulation as to the heart rate was successful over time and across the groups (see Figure 5).

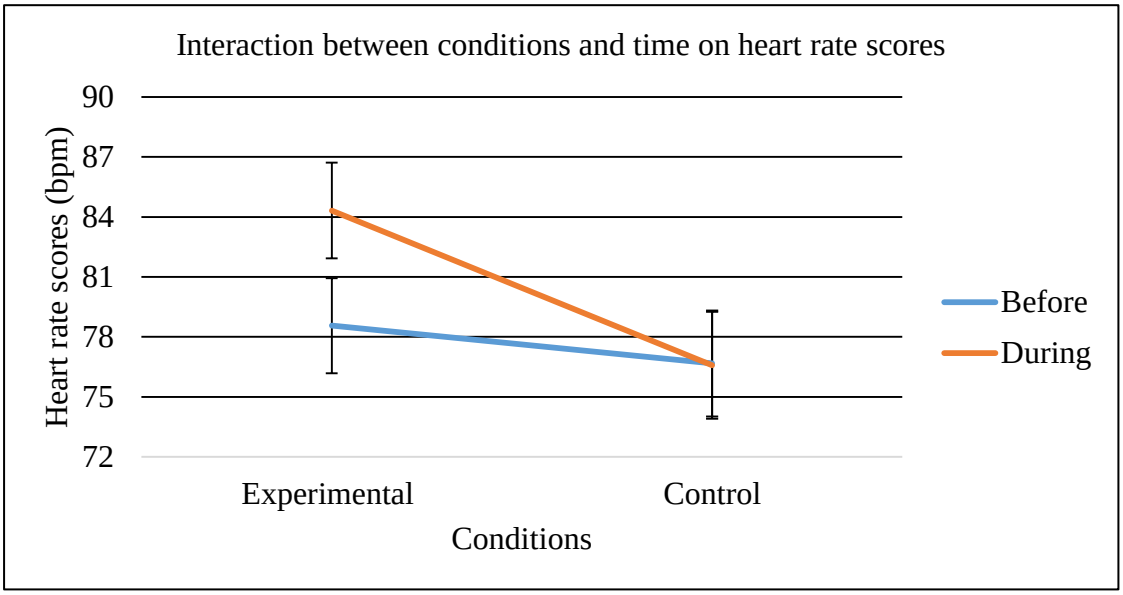

Figure 5. The interaction between Conditions (Experimental vs Control) and Time (before vs during) on Heart Rate Scores

Another 2x2 Mixed ANOVA was used to examine the means difference on the SCL values measured over time and across conditions. A significant main effect of the conditions on the GSR was found, $F(1, 43) = 7.71$, $p < .001$, $\eta_p^2 = .15$. This effect accounted for 15% of the variance. SCL was higher in the experimental condition than when compared to the control condition, (1.46 vs. 1.04μS). There was a significant interaction effect between time and conditions, $F(1, 43) = 7.23$, $p < .05$, $\eta_p^2 = .14$. This effect accounted for 14% of the variance. Post-hoc comparisons with the Scheffe test found that before the Cold Pressor Task, the participants in the experimental condition significantly differed from the participants in the control condition in regards to their SCL, (1.39 vs. 1.06μS, $p < .05$). In addition, during the Cold Pressor Task, the participants

in the experimental condition significantly differed from the participants in the control condition in relation to their SCL, (1.53 vs. 1.02 μS, $p < .05$) (see Figure 6).

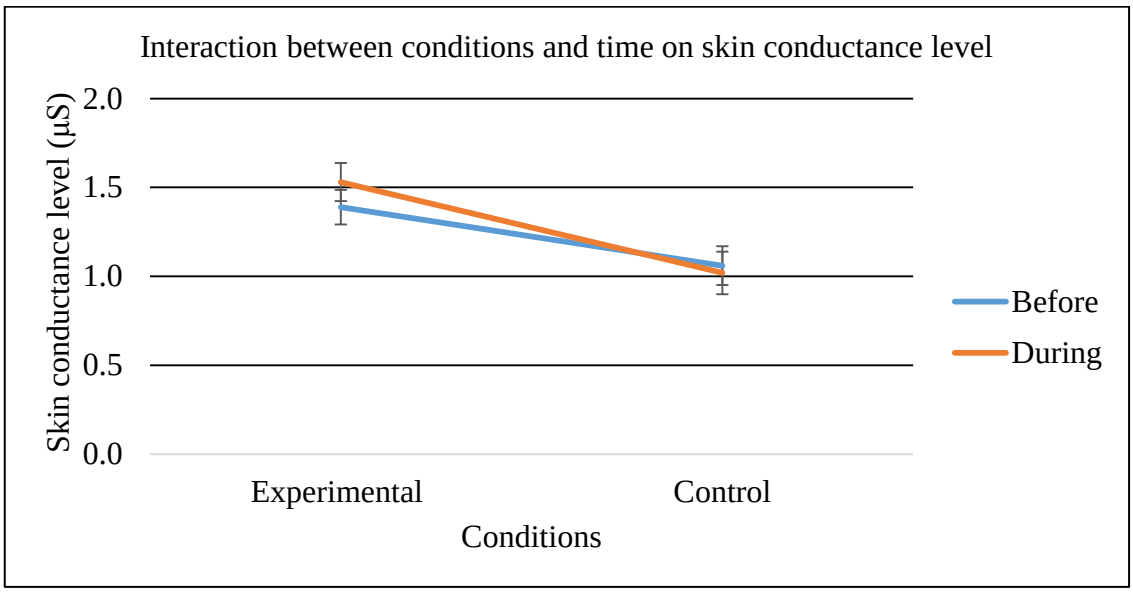

Figure 6. Interaction between Conditions (Experimental vs Control) and Time (before vs during) in Relation to SCL Scores

Furthermore, a 2x2 Mixed ANOVA was used to examine the means difference as to the scores of the State Anxiety Scale over time and across conditions. A significant main effect of the conditions on the anxiety scores was found, $F(1, 43) = 4.45$, $p < .05$, $\eta_p^2 = .09$. The anxiety scores were higher in the experimental condition than when compared to the control condition, (34.01 vs 29.75). More importantly, there was also a significant interaction effect between time and conditions, $F(1, 43) = 11.19$, $p < .01$, $\eta_p^2 = .21$. Post-hoc comparisons found that during the Cold Pressor Task, the participants in the experimental condition significantly differed from the participants in the control

condition in regards to their anxiety scores, (35.04 vs. 27.65, $p < .01$) (see Figure 7).

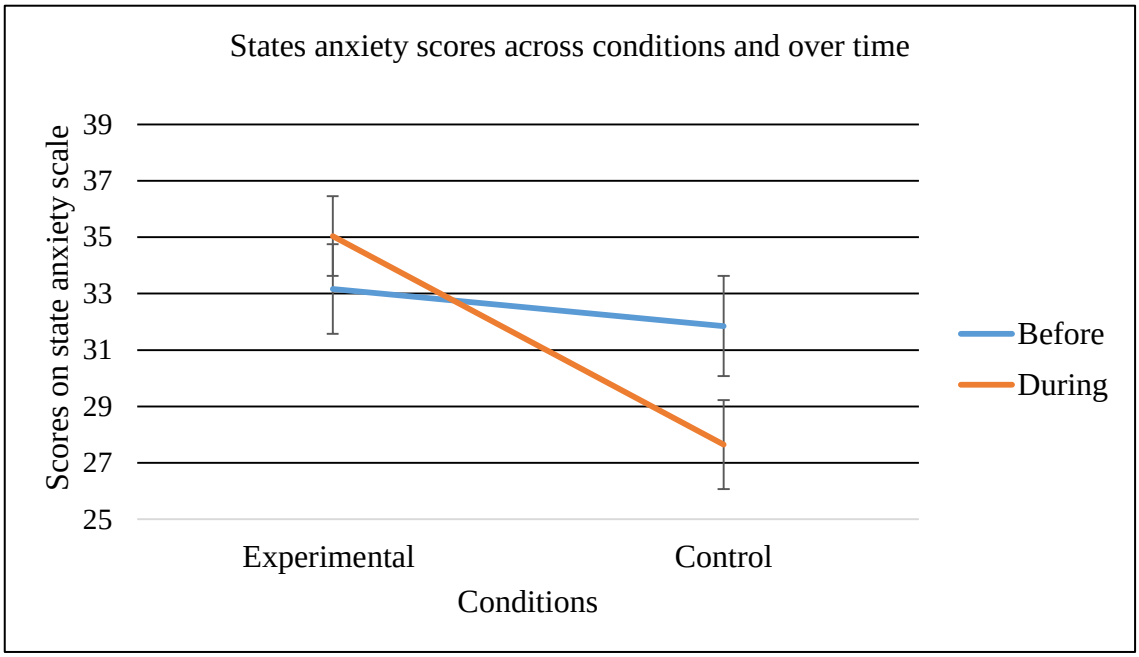

Figure 7. Interaction between Conditions (Experimental vs Control) and Time (before vs during) on State Anxiety Scale Scores

In taking the results of the heart rate, skin conductance and state anxiety scores together, the results suggest that in comparison to the control group, the participants in the experimental group significantly indicated higher values as to their heart rates, skin conductance responses and State Anxiety Scale scores, with this thus meaning that the manipulation was successful.

Multivariate Analysis of Covariance (MANCOVA)

A one-way MANCOVA was performed to examine whether the participants in the experimental and control conditions statistically differed based on HR, SCR and the State Anxiety Scale during the CPT after controlling for irrational happiness beliefs alongside the respective HR, SCR and State Anxiety Scale responses measured at the baseline. Scores as to the HR, SCL and State Anxiety Scale obtained during the CPT were used as dependent variables, while the conditions (experimental vs control) were

used as independent variables. As HR, SCL and state anxiety were also measured at their baseline, the respective HR, SCL and state anxiety baseline scores were treated as covariates in order to control for their effects on the HR, SCL and state anxiety scores obtained during the CPT. In that vein, irrational happiness beliefs was also treated as a covariate in the analysis. The Box's M test for the homogeneity of the covariance matrices was found to be 8.57 with associated *p* and F values of 1.318 and .245, respectively. Thus, the equality of the covariance matrices between the groups has not been violated.

A MANCOVA revealed a statistically significant effect for the conditions (experimental vs control) that was unlikely to have resulted from a sampling error alone, (Wilk's Lambda = .43, F (3, 37) = 16.224, $p < .001$, $\eta_p^2 = .57$); HR at baseline, (Wilk's Lambda = .07, F (3, 37) = 171.583, $p < .001$, $\eta_p^2 = .93$); SCL at baseline, (Wilk's Lambda = .18, F (3, 37) = 57.083, $p < .001$, $\eta_p^2 = .82$); and state anxiety at baseline, (Wilk's Lambda = .59, F (3, 37) = 8.760, $p < .001$, $\eta_p^2 = .42$). These results suggest that there was a significant difference among the groups on the linear composite of the dependent variables. The HR, SC, and state anxiety at baseline also had significant effects on the linear composite of the dependent variables. However, the multivariate test did not produce a significant effect for IHB as a covariate (Wilk's Lambda = .93, F (3, 37) = .99, $p = .404$, $\eta_p^2 = .08$). However, in considering Cohen's effect size criterion, 8% of the variance in the dependent variable was accounted for by irrational happiness beliefs. To put it another way, irrational happiness beliefs had a medium effect upon the linear combination of the dependent variables.

Levene's test of homogeneity of variance was found to be non-significant for all of the dependent variables; HR [$F (1, 43) = 3.06$, $p = .087$], SCR [$F (1, 43) = 3.53$, $p = .067$], and state anxiety [$F (1, 43) = .512$, $p = .478$], thus suggesting equal variance

between the groups. We also measured the pain threshold and pain tolerance of the participants in the experimental condition. Table 14 presents the correlations among the irrational happiness beliefs, pain threshold and pain tolerance aspects. As seen in Table 14, there is a negative pattern between irrational happiness and pain threshold and pain tolerance. Here, a higher pain tolerance was significantly correlated with a higher pain threshold.

Table 14. Correlations among Irrational Happiness Beliefs, pain threshold, and pain tolerance

	Mean	*SD*	IHB	Threshold	Tolerance
Irrational happiness beliefs	9.92	1.86	1		
Pain threshold	35.09	46.93	-0.41	1	
Pain tolerance	72.56	64.29	-0.23	.63**	1

**. $p < 0.01$ level (2-tailed).

Discussion

This study has been structured to examine the effect of irrational happiness beliefs on pain arousal in a sample of UK students. At first glance, the results of the current study indicate that irrational happiness beliefs do not have a statistically significant effect upon the variability of heart rates and skin conductance responses. However, it is important to note that such statistical significance is highly related to the number of participants in the sample, the size of the effect, the research design and the types of statistical test being performed (Coe, 2002; Kirk, 1996). In taking this into consideration, the results indicate that irrational happiness beliefs accounted for 8% of the variance in pain arousal. According to Cohen's (1988) effect size criterion, where variance ranging between .01 and .06 is considered to be a small effect while variance ranging between .06 and .14 and

greater than .14 are characterized as denoting a moderate and large effect, respectively, it can be said that irrational happiness beliefs had a medium effect upon pain experience. As noted above, this variation may be related to sample size. This signifies that if a larger sample size was employed, it would be possible to reach a significance probability level.

The present findings also indicate a negative pattern between irrational happiness beliefs and pain threshold and tolerance. These patterns are in the expected direction where higher irrational happiness beliefs may be correlated with a lower pain threshold and lower pain tolerance. However, as these patterns did not reach a significance level, we cannot conclude that there is a significant negative correlation between the variables. In considering the strength of the correlation coefficients among the variables, it is more likely that a significant result would be obtained if investigation of the variables were employed with a larger sample size.

Furthermore, the findings show that the average score for irrational happiness beliefs fell just below the midpoint of the scale (M = 9.92), with this suggesting that the holding of irrational beliefs is not a common characteristic in the sample used in the study. Hence, it is important to explain that the emergent findings are based on the study's sample characteristics. As the sample in this study completely consisted of volunteers, this may raise the issue of volunteer bias (e.g., Callahan, Hojat & Gonnella, 2007) whereby volunteers and those who don't volunteer are different in important ways (such as their willingness to take part in a study by completing the study requisites). The participants who voluntarily participated in this experiment could have thus possessed different characteristics in terms of holding irrational happiness beliefs in comparison to non-volunteers. This could have affected the results gained. For example, this could relate to the assumption held as to irrational happiness beliefs that those who possess such beliefs may largely engage in activities that stimulate more positive emotions and

pleasures and less negative emotions and displeasures. As the pain induction procedure of the Cold Pressor Task used in this study seemed to produce some degree of discomfort, negative emotions and displeasure by stimulating pain, it is likely that individuals with having medium or high levels of irrational happiness beliefs could have not chosen not to participate in the study. The use of different types of experimental procedure or the encouraging of individuals to participate in experiments aimed at examining individual differences in irrational happiness beliefs and experience of pain would be useful in uncovering how the holding of irrational happiness beliefs affects the experience of pain. This would also have important implications for research and practice.

It would be useful to position these results, as relate to irrational happiness beliefs, in the context of other individual differences variables since they have been found to be linked to cold pressor pain. For example, a number of studies have suggested that hope and optimism are negatively correlated with pain catastrophizing and pain (Berg, Snyder & Hamilton, 2008; Hood, Pulvers, Carrillo, Merchant & Thomas, 2012) alongside the fact that being mindful assists in enhancing pain tolerance (Hayes, Bissett, Korn & Zettle, 1999), increasing quality of life and decreasing stress symptoms (Carlson, Speca, Patel & Goodey, 2004). In this respect, it may be that people who possess higher individual differences characteristics (as reflect higher positive coping) may typically be superior in dealing with the Cold Pressor Task (Snyder *et al*., 2005). In relying on this reasoning, as a negative individual differences characteristic, the holding of irrational happiness beliefs may be negatively related to pain threshold and tolerance, although the reliability of this assumption is questionable as the obtained findings did not approach to the statistical significance level.

We acknowledge a number of limitations of this study. The first limitation is that the sample size used was relatively small and this precludes the generalizability of the

findings. Secondly, the participants were volunteers, as willingly provided the research data. However, data obtained from volunteers cannot be generalized to non-volunteers (Bogaert, 1996; Callahan, Hojat & Gonnella, 2007; Strassberg & Lowe 1995). Another limitation is that some studies have shown that hand size is a significant factor that affects pain threshold and pain tolerance (Snyder *et al*., 2005). Notably, we did not measure the participants' hand size to see if this correlated with their pain threshold and pain tolerance. Future studies should thus consider this as a covariate within the context of the Cold Pressor Task. Furthermore, we only measured heart rate and skin conductance responses as indicators of pain arousal and solely investigated the effect of irrational happiness beliefs on this particular part of the body. Investigating how irrational happiness beliefs is linked to arousal in the brain system may contribute to our understanding of irrational happiness beliefs within the neurobiology of this concept. Finally, it would be interesting to explore the effect of gender differences in irrational happiness beliefs on the experience of pain, with evidence having being found that females report a lower pain threshold and tolerance in comparison to males (Keogh & Birkby, 1999). Therefore, the giving of investigation as to the variation between males and females in regard to pain experience and how this relates to irrational happiness beliefs would be useful.

Chapter Seven

General Discussion

This thesis has proposed a new concept of happiness, *irrational happiness beliefs,* that reflects a dysfunctional aspect of happiness. The overall aim of this thesis has been to develop a measure of irrational happiness beliefs and examine its usefulness in regards to wider psychology. The thesis has particularly sought to use psychometric theories through which to develop a irrational happiness beliefs measure, achieving this through the employment of survey methods and by examining the relevance of irrational happiness beliefs towards well-being, coping strategies, personality and pain arousal. To this end, seven empirical studies have been presented through Chapter 2-6 alongside a systematic literature review in the preceding chapters. Each of these empirical studies has addressed a different aspect of the newly presented concept of irrational happiness beliefs, doing so through different methodological designs that include cross-sectional survey, longitudinal and experimental designs. In this concluding chapter, a summary of findings as to each of the study and their associated limitations and implications are presented. Recommendations for future studies are also to be highlighted.

Summary of Findings

Development of Irrational Happiness Beliefs Scale (Chapter Two)

The purpose of the present study has been to develop and validate an Irrational Happiness Beliefs Scale through which to fill the identified gap within the literature as to the dysfunctional aspect of happiness. To this end, this study used two empirical studies as included participants from the UK. The findings of the exploratory factor analysis, in which maximum likelihood analysis technique was used, provided evidence in support of a single-factor solution whereby it was verified that the three items on the Irrational

Happiness Beliefs Scale can be loaded to form a factor. The Irrational Happiness Beliefs Scale was indicated to have a good internal consistency reliability and a good convergent validity with measures of subjective well-being, psychological well-being, perceived stress, valuing happiness, rationality and irrationality. The relationships between irrational happiness beliefs and the strongly-established measures of well-being are in the expected direction with the theoretical proposal of irrational happiness beliefs. Furthermore, the scale has been shown to have discriminant validity with the valuing happiness measure (Mauss *et al*., 2011), a theoretically-similar construct to irrational happiness beliefs. Moreover, the confirmatory factor analysis employed, as used maximum likelihood estimation, provided support for the results of the exploratory factor analysis. The results of the confirmatory factor analysis have further demonstrated that a single latent variable referring to irrational happiness beliefs with three indicators presented the best fit for the data.

These findings are important for several reasons. Firstly, the findings show that the beliefs, as relate to the notion that the holding of happiness-related beliefs to an absolutistic level can be dysfunctional, can be measured with a reliable and valid instrument. Secondly, there are scant instruments assessing the dysfunctional aspects of happiness – with three notable examples being the Valuing Happiness Scale (Mauss *et al*., 2011), the Fear of Happiness Scale (Joshanloo, 2013a), and the Externality of Happiness Scale (Joshanloo, 2017). However, operationally, these scales rest on different theories. As the Irrational Happiness Beliefs Scale rests on REBT (Ellis, 1957a) and directly reflects the conditional aspect of happiness, it thus fills an important gap in the literature as to the absence of a measure through which happiness can be assessed from an absolutistic perspective. Thirdly, in considering that psychometric measures are crucial to any psychological empirical study designed to explore a given construct

(Abdel-Khalek, 2013), these findings offer an opportunity to attract a great deal of attention towards the study of the irrational happiness beliefs construct across cultures. As these findings are preliminary, there is still much work to be done regarding measurement invariance, factor structure and its relation with different variables across cultures and genders. Finally, the scale is also useful in terms of being short and including simple items that can be used in research and practice without taking too much space and time.

Structural Relationships between Irrational Happiness and Valuing Happiness (Chapter Three)

In this study, we examined the relationships between irrational happiness beliefs and valuing happiness via the use of CFA. Examination of the relationship between the variables within the CFA framework is useful in terms of understanding the measurement model that provides evidence as to the relationships that arise between the observed variables and with their related underlying constructs as well as the relationships between the latent variables (Tomás, Sancho, Melendez & Mayordomo, 2012). In this context, the measurement model indicates that all irrational happiness beliefs items significantly loaded on the proposed irrational happiness beliefs construct while all valuing happiness items significantly loaded on the proposed valuing happiness component constructs (three components). That is, the four-factor model in which there is a unidimensional model of irrational happiness beliefs and multidimensional model of valuing happiness including three factors fits the data better than other competing models. These empirical findings are in line with the theoretical proposal held between irrational happiness beliefs and valuing happiness, with this meaning that irrational happiness beliefs and valuing happiness are two distinct-yet-related constructs. As for the correlations that arise among the variables, the results indicate that irrational happiness beliefs is positively related with

the valuing happiness factors. The effect size of the emerging correlations among the variables was evaluated using a convention set out by Cohen (1988). According to this convention, an effect size with $r \geq = .5$ signifies a large effect size, while an effect size with $.3 \leq r < .5$, and $.1 \leq r < .3$ signifies a moderate effect and small effect size, respectively. Here, the correlations among the variables ranged between a moderate to a large effect.

In considering the correlations between irrational happiness beliefs and valuing happiness and items loading onto the respective constructs, the resultant findings were in the expected direction. However, the present findings as to the valuing happiness construct was not in accordance with those of Mauss *et al.* (2011), with this preceding research proposing valuing happiness as an unidimensional construct. In contrast to Mauss *et al.* (2011), Luhmann *et al*. (2016) suggested valuing happiness as being a multidimensional construct with three factors. This variation can be attributed to the characteristics of the sample used in each study, with this including the present study. While Mauss *et al*. (2011) solely used female subjects, Luhmann *et al*. (2016) and the present study used both male and female participants. Consequently, further research is needed to confirm the present findings.

The Effect of Irrational Happiness Beliefs on Subjective Well-Being over Time (Chapter Four)

This study aimed at establishing the predictive role of irrational happiness beliefs on subjective well-being over time. As indices of subjective well-being, we particularly focused on the effect of irrational happiness beliefs on the affective components of subjective well-being – namely positive affect and negative affect. The results gained did not provide support for the predictive role of irrational happiness beliefs on the affective

components of subjective well-being however. That is, irrational happiness beliefs did not naturally lead to increased negative affect and decrease positive affect during a life transition. This is not to say that irrational happiness beliefs did not have any effect upon well-being but rather it can be said that irrational happiness beliefs did not have a longitudinal effect upon the affective components of subjective well-being within the selected sample.

Well-being is a broad concept, which comprises a multifaceted concept of optimal experience and functioning. The conceptualisation of well-being is typically derived from two wider approaches (Ryan & Deci, 2001). The first approach is *subjective well-being,* as generally refers to a high frequency of positive affect, low frequency of negative affect and greater satisfaction with life. Subjective well-being includes both affective and cognitive components (Diener, Oishi & Lucas, 2002; Diener, Scollon & Lucas, 2003; Ryan & Deci, 2001). The second approach is *psychological well-being,* as typically refers to how to achieve the realisation of one's genuine potential, goals and meaning alongside achieving fulfilment in life (Ryff, 1989; Ryff and Keyes, 1995). According to Ryff (1989) and Ryff and Keyes (1995), psychological well-being includes six dimensions; autonomy, positive relations with others, environmental mastery, self-acceptance, personal growth and purpose in life. It is important to score highly in relation to these dimensions to be psychologically well.

As seen, well-being comprises of many facets. However, in this study only two have been focused upon. Although the present study has failed to provide support for the impact of irrational happiness beliefs on the affective components of subjective well-being over time, it has nonetheless offered a great opportunity to examine the longitudinal effect of irrational happiness beliefs on other dimensions of well-being within different models of well-being. For example, in Chapter Two, we found significant negative

correlations between irrational happiness beliefs, satisfaction with life and psychological well-being. As such, the effect of irrational happiness beliefs upon satisfaction with life and psychological well-being would be useful to investigate via a longitudinal study.

The present findings also offer an opportunity for future research to investigate the impact of irrational happiness beliefs upon subjective well-being beyond simple direct prediction. These results have thus opened up a new avenue for irrational happiness beliefs to be examined within mediation and moderation contexts, thus allowing a determination of the factors that affect the relationship between irrational happiness beliefs and well-being. It would be useful for future research to investigate whether irrational happiness beliefs are related to well-being through other factors rather than using it as a direct predictor of well-being. This would be fruitful in terms of considering the role of other factors alongside irrational happiness beliefs when designing and implementing interventions aimed at improving well-being through a reduction of irrational happiness beliefs.

As we only have chosen the affective components of subjective well-being as outcome variables in this study, the exploration of the effect of irrational happiness beliefs on other indices of subjective well-being (e.g., satisfaction with life) or other models of well-being (e.g., psychological well-being) would be useful in gaining a comprehensive understanding as to how irrational happiness beliefs is related to well-being.

Irrational Happiness Beliefs within an Adaptation-Continuum Model (Chapter Five)

In this study, examination has been given as to; (a) how personality and coping strategies could be integrated in terms of providing a context as part of an adaptation-

continuum model of personality and, (b) how irrational happiness beliefs relates to this integration. We hypothesised that Gray's model of personality can be incorporated with a Functional Dimensions of Coping model as part of an adaptation-continuum model. The results of the undertaken exploratory factor analysis indicate that personality and coping could be successfully mapped onto one another. This is particularly true for the adaptive dimensions of personality as grouped with the adaptive dimensions of coping strategies via the forming of the BAS-Coping factor. In contrast, the maladaptive personality dimension is grouped with the maladaptive dimension of coping by forming the BIS-Coping factor. These results have expanded upon the previous findings in which different models of personality and coping strategies were employed to provide important context for the examination of psychological variables (Ferguson, 2001; Maltby, Day & Barber, 2004; Maltby *et al*., 2004).

We also hypothesised that irrational happiness beliefs would be significantly positively correlated with BAS-Coping and significantly negatively correlated with BIS-Coping. The results show that irrational happiness beliefs is significantly correlated with BAS-Coping, but not with BIS-Coping. Individuals who score highly on irrational happiness beliefs are more likely to use BAS-Coping, namely as such figures seem to be sensitive to signals of reward by showing disposition personality characteristics towards approaching pleasant stimuli and coping with stressful events by approaching, regulating emotions and reappraising events.

As, prior to this research, there was no available information as to how irrational happiness beliefs relates to both personality and coping, this study offered information that contributes to our comprehension as to what extent the adaptation-continuum model of personality can be applied to understanding irrational happiness beliefs. These finding are also important in terms of understanding not only personality characteristics, but also

coping strategies that are related to irrational happiness beliefs. Furthermore, the study has provided evidence that strengthens the theoretical and empirical underpinning of irrational happiness beliefs.

Irrational Happiness Beliefs within the Context of the Cold Pressor Task (Chapter Six)

The aim of this study was to further expand upon the empirical underpinnings of irrational happiness beliefs within experimental settings. This study employed the Cold Pressor Task to investigate the extent to which irrational happiness beliefs is associated with physiological arousal and self-reported pain threshold and tolerance. Overall, the findings have demonstrated a medium effect of irrational happiness beliefs on arousal, yet the emerging effect did not reach a significance level because the significance of the probability *p* value is sensitive to several factors such as the sample size, the size of the effect, and the spread of the data (Coe, 2002; Dahiru, 2008; Kirk, 1996). According to Dahiru (2008), it is more likely to detect a statistical significant difference with a large sample as compared to a small sample. Having a large effect size between two groups is more likely to produce a significant *p*-value as compared to a small effect between the groups. A bigger standard deviation in a data set is more likely to result in a significant *p*-value. Although not statistically significant, a pattern in the expected direction was obtained between irrational happiness beliefs and pain threshold and pain tolerance. The findings also revealed that irrational happiness beliefs are not a common characteristic among the employed sample as it was scored just below the midpoint of the scale, with this suggesting that while there is some indication that irrational happiness beliefs is related with arousal, the interpretation given as to these findings should be made with caution.

The interpretation of the results obtained relating to irrational happiness beliefs in this study should be made in the context of other individual difference variables as these have been found to be linked to cold pressor pain. For instance, research has indicated that hope and optimism are negatively correlated with pain catastrophising and pain (Berg, Snyder & Hamilton, 2008; Hood, Pulvers, Carrillo, Merchant & Thomas, 2012), while higher levels of mindfulness are related to higher pain tolerance (Hayes, Bissett, Korn & Zettle, 1999), increased quality of life and decreased stress symptoms (Carlson, Speca, Patel & Goodey, 2004). Similarly, higher pain experience was found to be related to higher anxiety sensitivity (Keogh & Birkby, 1999; Keogh & Mansoor, 2001), anger suppression (Burns, Quartana & Bruehl, 2007; Quartana, Yoon & Burns, 2007), stress, anxiety and depression (Keogh & Mansoor, 2001). According to Snyder *et al*. (2005), individuals who possess higher levels of individual differences characteristics, as reflects higher positive coping, may typically be superior in dealing with the Cold Pressor Task. Through this reasoning, as a negative individual difference characteristic, the holding of irrational happiness beliefs may be negatively related to pain threshold and tolerance although the reliability of this assumption is questionable, as the obtained findings did not approach to the statistical significance level.

In summary, this study presents empirical evidence as to the relationship between irrational happiness beliefs and arousal by using the Cold Pressor Task experimental procedure. Results indicated a medium effect of irrational happiness beliefs on arousal, yet the emerging effect did not reach to a significance level. Having of irrational happiness beliefs may be negatively related to pain threshold and tolerance. This thus strengthens the empirical underpinning of irrational happiness beliefs in both research and practice.

General Limitations of the Research

Although the present thesis has provided important evidence as to the concept and measurement of irrational happiness beliefs and its importance within wider psychology, its results should be considered in the light of several methodological limitations. While we have highlighted the limitations of each of study in the relevant chapters, below we present the overall limitations that correspond to the studies. The foremost limitation of this thesis pertains to the use of self-report methodologies that raise concerns as to the validity of the gained results. Indeed, due to its ease of administration and collection of large amounts of data from samples quickly and cheaply, self-report measures are extensively used within the Psychology through questionnaires. Notably, this allows the assessment of the variables of interests. Studies have indicated that subjective self-reported well-being measurements are valid and reliable in measuring happiness-related constructs, even when compared to non-self-reported measures (Sandvik, Diener, & Seidlitz, 1993). Although the self-report measures used in this thesis have been widely studied and evaluated for adequate reliabilities and validities, a possibility remains that reliance given as to their usage may have resulted in some issues. For example, the participants recruited for this thesis may have been affected by various factors – such as self-deception, social desirability and inaccurate memory recall (e.g., answering questions in favour of others and overestimating/underestimating the responses).

Another important limitation relates to the generalisability of the present findings. The samples used in this thesis were generally students and were, overall, homogenous. Importantly, attempts were made to address this issue in Chapter Three and Chapter Five by collecting additional data from both the UK and USA, with data collected from both the UK and the USA in Chapter Three and data collected from the USA in Chapter Five. Due to the use of a convenience sampling procedure in both countries, the number of

female participants was substantially larger than male participants in both countries. The age distributions also differed substantially for the sample used in Chapter Five when compared to the samples used in other chapters. It is likely that the results of this thesis may have been affected by the nature of the sample and may therefore differ in relation to other samples with different characteristics. The generalisability of the present findings to other samples is thus ambiguous and should be undertaken with great caution.

Furthermore, as the irrational happiness beliefs construct is new yet worth investigating, it will be important to explore its relationship with other variables (e.g., resilience and mental health) if a better understanding is to be gained as to its causes and correlates. This is particularly true when determining what factors cause individuals to hold irrational happiness beliefs and how they affect well-being and mental health. Exploration being given as to the potential mediators in the relationships that arise between irrational happiness beliefs and other psychological variables would be fruitful in understanding the mechanism underlying irrational happiness beliefs. Moreover, the studies presented in this thesis were mainly exploratory in nature. While we did not manipulate the irrational happiness beliefs to see its effect upon the variables of interest, the manipulating of irrational happiness beliefs within an experimental setting would be interesting in terms of it providing more conclusive evidence.

Finally, the concept of irrational happiness beliefs is grounded within REBT. A basic assumption of REBT is that people have the biological and cultural tendency to think irrationally, as is dysfunctional and unhealthy, with this resulting in individuals encountering emotional disturbance. In considering this assumption, it may be possible for people to hold irrational happiness beliefs due to their biological disposition and cultural tendencies. Since the participants in the current research were mainly recruited from United Kingdom universities and from the United States community, it would be

useful to provide support from different cultures, particularly from non-western cultures. Evidence that further clarifies the relationship between irrational happiness beliefs and the biological disposition of individuals would be useful in better understanding irrational happiness beliefs.

General Implications of the Research

The foremost implication of this thesis is that a new avenue for happiness research needs to be taken into consideration when attempts are made as to producing a complete picture of happiness beyond its default position. In this new avenue, happiness is considered as an absolute where holding particular happiness-related beliefs that include the specific words of *should, ought and must* can be detrimental for positive human functioning due to these causing emotional disturbance. That is, irrational happiness beliefs can be viewed as a potentially dysfunctional and conditional aspect of happiness where one places excessive standards upon themselves in attaining happiness. Indeed, setting of attainable happiness-related goals to reach an optimal level of happiness can be healthy, whereby individuals can be encouraged to pursue plausible goals to some extent for positive functioning. However, conditional, irrational and absolutistic goals or standards appear hard to fulfil and can backfire as they may be beyond an individual's optimal levels. Failure to achieve those goals or standards may lead to emotional disturbance as people do not find routes to happiness at all the times. This is an important point and should be carefully considered in both theory and practice.

Introducing the *concept of irrational happiness beliefs* into the field of well-being psychology is a major contribution of the present thesis. Notably, this concept extends the presently held understanding of happiness. To measure this concept, the findings as to the Irrational Happiness Beliefs Scale are promising. The scale was developed to assess

the view that holding absolute beliefs may have a negative effect upon well-being. The initial analysis verified that the scale is both reliable and valid. The emerged findings from the present thesis have provided an important context in which to examine irrational happiness beliefs and its relationship with well-being, personality, coping strategies and other relevant constructs. The development of the irrational happiness beliefs measure makes it possible to investigate the relationship between irrational happiness beliefs and other relevant variables, while the development of the Irrational Happiness Beliefs Scale also allows researchers to cross-culturally study irrational happiness beliefs and promote cross-cultural comparisons as to the possible irrational happiness beliefs research outcomes. This scale can also contribute to better understandings being held as to the similarities and differences in how irrational happiness beliefs is studied within and across the cultures of different populations.

The findings presented in this thesis have implications for practice, particularly in understanding irrational happiness beliefs and its related interventions as aim at reducing held levels of irrational happiness beliefs. Firstly, such an understanding would be useful for health professionals in determining the characteristics of individuals who hold irrational happiness beliefs. Furthermore, it would be very useful to measure these characteristics via a measure that demonstrates good psychometric properties. Through the Irrational Happiness Beliefs Scale, health professionals can determine the held levels of irrational happiness beliefs. Secondly, in using the irrational happiness beliefs measure, healthcare professionals, educators and policy makers can develop, implement and measure the effects of interventions focused on reducing the held levels of irrational happiness beliefs in an attempt to increase a person's well-being and quality of life.

According to Ellis and Whiteley (1979), individuals can behave differently by changing their cognitive, emotive and behavioural processes in such a way as causes them

to feel depressed, anxious, angry and to exhibit self-defeating behaviours, while allowing them to train themselves in order to focus on their abilities as creates positivity and the ability to cope with internal and external-caused emotional disturbances. Given that individuals have the capacity to feel less emotionally disturbed, well-structured programmes and activities that stress healthy happiness beliefs can be prepared and implemented within colleges and universities. This may foster individuals towards becoming less vulnerable to the negative effects of irrational happiness beliefs. If the irrational happiness beliefs of individuals, as have the potential to be dysfunctional and lead to possible emotional disturbance, can be reduced, this might eventually have a positive effect upon an individual's well-being towards growth and self-actualisation. In light of the present findings, university counselling and well-being centres might offer psychological support to those students who hold high levels of irrational happiness beliefs in an attempt to reduce those beliefs and instil positive functioning in different life domains. This could be achieved by preparing effective and supporting activity programmes focused on reducing irrational happiness beliefs and increasing adaptive, functional and rational skills for students to be happier.

Finally, the findings presented in this thesis have implications for policy-makers. To improve subjective and psychological well-being at the individual and national-level, it would be useful to determine the causes and correlates of such well-being. From this, policy-makers can design and implement policies that focus on improving the well-being of individuals. Notably, we found that irrational happiness beliefs is associated with the indices of well-being, personality and coping strategies.

Future Directions

The present research has represented the first attempt to provide preliminary empirical evidence as to the conceptualisation of irrational happiness beliefs, its reliability and validity of the measurement and its relation to wider psychology. In light of these findings, subsequent research in the field of the dysfunctional aspect of happiness or its related fields should continue to expand upon the results presented in this thesis. This can be achieved by using different methodologies, including via both qualitative and quantitative research methods. This would be useful in gaining a comprehensive understanding of irrational happiness beliefs and its relation to human functioning and mental health. In using exploratory and confirmatory factor analysis, Chapter Two provided evidence as to the factor structure of irrational happiness beliefs, while the data provided a one-factor solution for the measure. Subsequent studies should employ similar methods through which to confirm whether a one-factor solution is invariant across gender and cultures. As different genders or individuals in different cultures may respond to irrational happiness beliefs in a functionally different way, this would be fruitful for the applicability of the measure across genders and cultures.

Chapter Three tested the factor structure of the irrational happiness measure against valuing happiness. The construct of valuing happiness has been selected as a candidate for comparison due to its theoretical relevance with irrational happiness beliefs. However, some concerns have been raised as to the factor structure of the Valuing Happiness Scale. As opposed to the original version of the scale (Mauss *et al*., 2011), as was proposed as a unidimensional measure of dysfunctional happiness, research has suggested a three-factor solution for the scale with one of these factors indeed being positively correlated with well-being while others are negatively correlated with well-being (Luhmann *et al*., 2016). Due to this inconsistency as to the factor structure of the

Valuing Happiness Scale and its dynamic relationship with well-being, it can be concluded that selecting the Valuing Happiness Scale for comparison with the Irrational Happiness Beliefs Scale could not have been the best candidate. Future research should consider other possible candidates for testing the factor structure of irrational happiness beliefs as this would allow us to gain more insight into the factor structure of irrational happiness. Indeed, irrational happiness beliefs may have a higher order factor solution with other candidates.

Greater effort should be given towards understanding, via longitudinal research, the effect of irrational happiness beliefs on different models of well-being. Although it failed to meet its initial aims, Chapter Four sought to identify the predictive role of irrational happiness beliefs on subjective well-being by using the model of affect proposed by Watson *et al*. (1988). In adapting different models of subjective well-being and psychological well-being – such as the Positive and Negative Experience Model of Diener *et al*. (2010), the Satisfaction with Life Model of Diener *et al*. (1985) and the Psychological Well-Being Model of Ryff (1989) – would be beneficial in providing richer and more intelligible results as to the longitudinal impact of irrational happiness beliefs upon well-being. Likewise, having a stronger understanding as to the position of irrational happiness beliefs by using different models of personality and coping within the context of the adaptational-continuum model would be useful. Chapter Six transferred irrational happiness beliefs into experimental settings. A medium effect of irrational happiness beliefs on pain arousal was obtained using the Cold Pressor Task. In that experiment, pain induction via physical stimulus was used to elicit arousal. The use of a wide range of emotional stimuli would be very interesting in understanding the effect of irrational happiness beliefs upon arousal.

Finally, this research mainly applied to the UK, a Western county, with the variables used in this thesis being based on Western understanding and conceptualization. For example, we selected elements of well-being as outcome variables in Chapter Four. In considering that the conceptualisation of well-being is predominantly based on Western perceptions of well-being (Joshanloo, 2013b), the replication of these studies in different cultural settings via indigenous examination (e.g., in East Asia and Middle East) would be useful in increasing the generalisability of findings as elements of well-being may behave differently in different cultures. There is thus a need to replicate and verify the current findings.

Conclusion

This thesis has mainly sought to propose a new psychological concept, *irrational happiness beliefs,* by developing an irrational happiness beliefs measure and testing its usefulness to wider psychology – including in relation to valuing happiness, well-being, personality, coping, and arousal. To this end, seven studies were conducted using various designs. Study 1 showed that the concept of irrational happiness could be operationalised with a new measure of happiness, the Irrational Happiness Beliefs Scale, as was shown to be a unidimensional scale with satisfactory reliability and validity. Study 2 verified the unidimensional factor structure of the Irrational Happiness Beliefs Scale. Study 3 and 4 compared the factor structure of irrational happiness beliefs against valuing happiness, whereby it was demonstrated that irrational happiness beliefs and valuing happiness were two distinct-yet-related constructs that reflect the dysfunctional aspects of happiness. Study 5 set out to examine the impact of irrational happiness beliefs in predicting the affective components of subjective well-being over time (i.e., over three months) and its test-retest reliability. The study produced a satisfactory test-retest reliability for the scale, yet it failed to provide support for the impact of irrational happiness beliefs in predicting

positive affect and negative affect as components of subjective well-being. Study 6 sought to investigate irrational happiness beliefs within the context of the adaptational-continuum model by applying Functional Dimensional Coping Strategies and the Behavioural Inhibition System (BIS) and Behavioural Activation System (BAS) model of personality. The results reveal that irrational happiness beliefs could be best characterised within the dimensions of BAS personality and approach, emotional regulation and reappraisal copings. Finally, Study 7 investigated the effect of irrational happiness beliefs on arousal, subsequently finding that irrational happiness beliefs has a medium effect upon arousal as measured using physiological changes in the heart rate and skin conductance responses derived from the undertaking of the Cold Pressor Task. In general, the results of this thesis suggest that the concept and measurement of irrational happiness beliefs are useful in gaining a better understanding of the negative aspects of happiness and its negative relation with the positive indices of well-being and other positive psychological constructs. The research presents an important step in introducing the construct of irrational happiness beliefs and operationalising it with a short applicable unidimensional measure. The scale can contribute to the literature of this area by facilitating the progression of studies as to the dysfunctional aspect of happiness. The findings also have significant implications for the design and evaluation of intervention programmes aimed at promoting the development of mental health.

It is our beliefs system that affects us towards being happy or unhappy. If happiness seems temporary and difficult to attain, it is because one allows their faulty beliefs system to affect their happiness. If happiness is long lasting and continuous, it is because one allows their healthy beliefs system to affect their happiness. Avoiding conditioned words (e.g., “must”, “should” and “ought”) is useful to have a healthy belief system that may lead to positive human functioning.

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Appendices

Appendix A

Ethical Approval and Consent Form

UNIVERSITY OF LEICESTER

University Ethics Sub-Committee for Psychology

10/10/2016

Ethics Reference: 9035-jm148-neuroscience,psychologyandbehaviour
TO:
Name of Researcher Applicant: John J. (Dr.) Maltby
Department: Psychology
Research Project Title: Individual Differences, Affect and Cognitive Learning in relation to reactions to the Cold Pressor Task and Pleasant and Unpleasant Visual Stimuli.

Dear John J. (Dr.) Maltby,

RE: Ethics review of Research Study application

The University Ethics Sub-Committee for Psychology has reviewed and discussed the above application.

1. Ethical opinion

The Sub-Committee grants ethical approval to the above research project on the basis described in the application form and supporting documentation, subject to the conditions specified below.

2. Summary of ethics review discussion

The Committee noted the following issues:
Happy to approve this application. Good luck

3. General conditions of the ethical approval

The ethics approval is subject to the following general conditions being met prior to the start of the project:
As the Principal Investigator, you are expected to deliver the research project in accordance with the University's policies and procedures, which includes the University's Research Code of Conduct and the University's Research Ethics Policy.
If relevant, management permission or approval (gate keeper role) must be obtained from host organisation prior to the start of the study at the site concerned.

4. Reporting requirements after ethical approval

You are expected to notify the Sub-Committee about:

- Significant amendments to the project
- Serious breaches of the protocol
- Annual progress reports
- Notifying the end of the study

5. Use of application information

Details from your ethics application will be stored on the University Ethics Online System. With your permission, the Sub-Committee may wish to use parts of the application in an anonymised format for training or sharing best practice. Please let me know if you do not want the application details to be used in this manner.
Best wishes for the success of this research project.
Yours sincerely,

Prof. Panos Vostanis
Chair

Participant Consent Form

BACKGROUND INFORMATION

Title: Individual Differences, Affect and Learning in relation to reactions to the Cold Pressor Task and Pleasant and Unpleasant Visual Stimuli.
Researchers: Murat Yildirim, Gonzalo Urcelay, John Maltby
Purpose of data collection: Staff, PhD and Dissertation/Project Research

1. Proposed aim
The current study explores the relationship between self-reports of affect, stress, personality traits, behavioural assessments of emotional/pain/discomfort reactions, and performance of cognitive learning and attention tasks.

2. Detailed methodology
This study comprises a questionnaire and experimental measures and will be administered via the School of Psychology Experiment Participation Requirement (EPR) Scheme. In this study we will use a number of questionnaires you will self-report your own feeling, thoughts and behaviours. You will then be asked to be involved in two or three behavioural tasks. The first will be a series of computer tasks in which you will be asked to complete cognitive based learning tasks. The second will involve an experiment by putting your hand into very cold water as long as you can. The third will involve assessing your reactions to sets of visual stimuli.

Specifically you will be completing the following measures of:

1. Questionnaires measure of affect, stress, and personality. These will be self-report measures.
2. Cognitive Learning Tasks. These will be computer tasks that you will be asked to complete that involve measuring learning, goal attention, cognitive control and supervisory attentional systems
3. Cold Pressor Task to assess your physical ability to tolerate physical stimuli (Cold Water, 1 degree centigrade). The cold pressor task is a well used experimental paradigm, cardiovascular test performed by immersing the hand into an ice water container, usually for one minute, and measuring changes in blood pressure and heart rate. These changes relate to vascular response and pulse excitability. This is done by requiring a participant to place their hand in the cold pressor for as long as they can. **Once discomfort is present, you will let the researcher know. Once the discomfort is unbearable, you will remove your hand.** The test is completely non-harmful and innocuous. This provides a measure of threshold and tolerance. The temperature of the water will never be below 2 degrees centigrade. The Fingertip Pulse Heart Rate Monitor and Blood Pressure will be used to assess oxygen and heart rate.
4. Reactions to affective stimulus. The affective stimulus consists of two sets of media. The first set has four short video-clips (2 pleasant and 2 unpleasant clips), while the second set has pictures from the established database of stimuli. This consists of 10 pleasant, 10 neutral and 10 unpleasant pictures which will be presented in a computer monitor and your reactions will be measured via a galvanic skin response logger sensor instrument (NUL-217) to assess heart rate (HR), and SCR or natural galvanic skin response (GSR) which is related to psycho-activity sweat gland as part of the sympathetic nervous system.

We may at times also digitally record some of the sessions, so we can make accurate assessments.

3. A key consideration you will need to make before starting the study.

You will always be free to withdraw from the experiment at any point if you decide to take part. However, given the cold pressor task is likely to cause discomfort then we suggest that if you are currently suffering from a medical condition, no matter how mild, you should not take part. We would even extend that to if you have been to the doctors for any treatment in the last month. We also suggest if you are likely to get upset with feeling pain/discomfort we suggest this experiment may not be for you. Please remember there are many other studies that you will be able to participate in as part of the EPR scheme. Furthermore, if you do decide to take part, but then decide to withdraw, you are free to do so.

At no point will you be identifiable from your answers and your participation in the experiment will be confidential to the researchers for two purposes. The first is awarding you EPR credit. The second is to keep a record of participation and consent of those taking part in the study in case there is ever a query about the probity of the study (for example sometimes journals ask for verification from all researchers that they were fully aware there was a participation list).

The consent and participation records will be kept separately from the data in a locked cabinet for up to a period of five years. After this the consent records will be deleted using the University of Leicester's Waste Management Team's procedures for destroying confidential material.

The answers to the question will not be used to make any individual assessments; rather we are only interested in comparing group averages.

It is important to remember that if you do decide to take part in the experiment, but then decide to withdraw, at any point, you should feel no compulsion to continue, then please do finish the experimenter. Just inform the experimenter, and they will be happy for you to withdraw.

CONSENT STATEMENT

1. I understand that my participation is voluntary and that I may withdraw from the research at any time up until 1st August 2017 without giving any reason. I understand that to do this during the survey I can exit the EPR/SONA or use the withdrawal system available in the survey window when completing the survey. I understand that to withdraw after I have completed the survey, I can contact John Maltby on jm148@le.ac.uk stating my Personal Identification Number.

2. My data are to be held confidentially by the named researchers. Any video recording made will be destroyed at the end of the session.

3. Records of my consent will be kept separately from my data in a locked cabinet for up to a period of five years.

4. Records of consent will only be shared among the named researchers and Dr John Maltby supervisor, if required by a journal submission. After a period of five years the consent forms will be deleted using the University of Leicester's Waste Management Team's procedures for destroying confidential material.

5. My data, which will be in paper and electronic form, will be downloaded from the computer when the data collecting part of the study has been completed. This will become coded data and you will not identifiable from the data.

6. In accordance with the requirements of some scientific journals and organisations, I understand that the coded data will also be kept in electronic form for up to five years. After this

time they will be deleted using the University of Leicester's Waste Management Team's procedures for destroying confidential material on digital storage media.

7. In accordance with the requirements of some scientific journals and organisations, I understand that my coded data may be shared with other competent researchers outside those listed in the consent form. I understand that my coded data may also be used in other related studies. My name and any other identifying details of taking part in the study will not be shared with these individuals.

8. The overall findings may be submitted for publication in a scientific journal, or presented at scientific conferences.

9. This study will take approximately 5 to 7 months to complete.

10. I will be able to obtain general information about the results of this research by giving the researcher my email address within a space that will be highlighted at the end of the survey.

11. I have read and understood the Information Sheet

12. I have considered the possible health risks, and feel fully informed about the task, particularly the cold pressor task and the affective stimuli. I can confirm I do not have a cardiovascular condition or currently or recently receiving treatment for a medical condition. Please note if you have not fully read the introduction that describes the tests we suggest you do so.

13. I have had the opportunity to ask questions about the study

14. All my questions have been answered satisfactorily?

15. I understand that I am free to withdraw from the study

16. I agree to take part in the study

I am giving my consent for data to be used for the outlined purposes of the present study

All questions that I have about the research have been satisfactorily answered.

I agree to participate.

Participant's signature: _____

Participant's name (please print): _____

Date: _____

If you would like to receive a summary of the results by e-mail, when this is available, please provide your email address: _____

Please note that this form will be kept separately from your data

Appendix B

Scales used in this thesis

Irrational Happiness Beliefs Scale

Instruction: Below are three statements that you may agree or disagree with. Using the 1-7 scale below, please indicate your agreement with each item by circling the appropriate number on the line following that item.

1	2	3	4	5	6	7
Strongly disagree	Somewhat disagree	A little disagree	Neither agree nor disagree	A little agree	Somewhat agree	Strongly agree

1. I should always be happy in all aspects of my life.	1	2	3	4	5	6	7
2. I must always be happy in all aspects of my life.	1	2	3	4	5	6	7
3. I ought always to be happy in all aspects of my life.	1	2	3	4	5	6	7

Valuing Happiness Questionnaire

Instruction: Below are seven statements that you may agree or disagree with. Using the 1-7 scale below, please indicate your agreement with each item by circling the appropriate number on the line following that item.

1	2	3	4	5	6	7
Strongly disagree	Somewhat disagree	A little disagree	Neither agree nor disagree	A little agree	Somewhat agree	Strongly agree

1. How happy I am at any given moment says a lot about how worthwhile my life is.	1	2	3	4	5	6	7
2. If I don't feel happy, maybe there is something wrong with me.	1	2	3	4	5	6	7
3. I value things in life only to the extent that they influence my personal happiness.	1	2	3	4	5	6	7
4. I would like to happier than I generally am.	1	2	3	4	5	6	7
5. Feeling happy is extremely important for me.	1	2	3	4	5	6	7
6. I am concerned about my happiness even when I feel happy.	1	2	3	4	5	6	7
7. To have a meaningful life, I need to feel happy most of the time.	1	2	3	4	5	6	7

Satisfaction with Life Scale (SWLS)

Below are five statements that you may agree or disagree with. Using the 1 - 7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding.

- 7 - Strongly agree
- 6 - Agree
- 5 - Slightly agree
- 4 - Neither agree nor disagree
- 3 - Slightly disagree
- 2 - Disagree
- 1 - Strongly disagree

____ 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.

Subjective Happiness Scale

For each of the following statements and/or questions, please circle the point on the scale that you feel is most appropriate in describing you.

1. In general, I consider myself:

1	2	3	4	5	6	7
not a very happy person						a very happy person

2. Compared with most of my peers, I consider myself:

1	2	3	4	5	6	7
less happy						more happy

3. Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything. To what extent does this characterization describe you?

1	2	3	4	5	6	7
not at all						a great deal

4. Some people are generally not very happy. Although they are not depressed, they never seem as happy as they might be. To what extent does this characterization describe you?

1	2	3	4	5	6	7
not at all						a great deal

Positive and Negative Affect Schedule (PANAS)

This scale consists of a number of words that describe different feelings and emotions. Read each item and indicate to what extent you have felt like this over the past week.

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
1. Interested	1	2	3	4	5
2. Distressed	1	2	3	4	5
3. Excited	1	2	3	4	5
4. Upset	1	2	3	4	5
5. Strong	1	2	3	4	5
6. Guilty	1	2	3	4	5
7. Scared	1	2	3	4	5
8. Hostile	1	2	3	4	5
9. Enthusiastic	1	2	3	4	5
10. Proud	1	2	3	4	5
11 Irritable	1	2	3	4	5
12. Alert	1	2	3	4	5
13. Ashamed	1	2	3	4	5
14. Inspired	1	2	3	4	5
15. Nervous	1	2	3	4	5
16. Determined	1	2	3	4	5
17. Attentive	1	2	3	4	5
18. Jittery	1	2	3	4	5
19. Active	1	2	3	4	5
20. Afraid	1	2	3	4	5

SCALES OF PSYCHOLOGICAL WELL-BEING

The following set of statements deals with how you might feel about yourself and your life. Please remember that there are neither right nor wrong answers.

Circle the number that best describes the degree to which you agree or disagree with each statement.	Strongly Disagree	Disagree	Disagree Slightly	Agree Slightly	Agree	Strongly Agree
1. Most people see me as loving and affectionate.	1	2	3	4	5	6
2. I am not afraid to voice my opinion, even when they are in opposition to the opinions of most people.	1	2	3	4	5	6
3. In general, I feel I am in charge of the situation in which I live.	1	2	3	4	5	6
4. I am not interested in activities that will expand my horizons.	1	2	3	4	5	6
5. I live life one day at a time and don't really think about the future.	1	2	3	4	5	6
6. When I look at the story of my life, I am pleased with how things have turned out.	1	2	3	4	5	6
7. Maintaining close relationships has been difficulty and frustrating for me.	1	2	3	4	5	6
8. My decisions are not usually influenced by what everyone else is doing.	1	2	3	4	5	6
9. The demands of everyday life often get me down.	1	2	3	4	5	6
10. I don't want to try new ways of doing things—my life is fine the way it is.	1	2	3	4	5	6
11. I tend to focus on the present, because the future always brings me problems.	1	2	3	4	5	6
12. In general, I feel confident and positive about myself.	1	2	3	4	5	6
13. I often feel lonely because I have few close friends with whom to share my concerns.	1	2	3	4	5	6
14. I tend to worry about what other people think of me.	1	2	3	4	5	6
15. I do not fit very well with the people and the community around me.	1	2	3	4	5	6
16. I think it is important to have new experiences that challenge how you think about yourself and the world.	1	2	3	4	5	6
17. My daily activities often seem trivial and unimportant to me.	1	2	3	4	5	6
18. I feel like many of the people I know have gotten more out of life than I have.	1	2	3	4	5	6
19. I enjoy personal and mutual conversations with family members or friends.	1	2	3	4	5	6
20. Being happy with myself is more important to me than having others approve of me.	1	2	3	4	5	6

Circle the number that best describes the degree to which you agree or disagree with each statement.	Strongly Disagree	Disagree	Disagree Slightly	Agree Slightly	Agree	Strongly Agree
21. I am quite good at managing the many responsibilities of my daily life.	1	2	3	4	5	6
22. When I think about it, I haven't really improved much as a person over the years.	1	2	3	4	5	6
23. I don't have a good sense of what it is I'm trying to accomplish in my life.	1	2	3	4	5	6
24. I like most aspects of my personality.	1	2	3	4	5	6
25. I don't have many people who want to listen when I need to talk.	1	2	3	4	5	6
26. I tend to be influenced by people with strong opinions.	1	2	3	4	5	6
27. I often feel overwhelmed by my responsibilities.	1	2	3	4	5	6
28. I have a sense that I have developed a lot as a person over time.	1	2	3	4	5	6
29. I used to set goals for myself, but that now seems a waste of time.	1	2	3	4	5	6
30. I made some mistakes in the past, but I feel that all in all everything has worked out for the best.	1	2	3	4	5	6
31. It seems to me that most other people have more friends than I do.	1	2	3	4	5	6
32. I have confidence in my opinions, even if they are contrary to the general consensus.	1	2	3	4	5	6
33. I generally do a good job of taking care of my personal finances and affairs.	1	2	3	4	5	6
34. I do not enjoy being in new situations that require me to change my old familiar ways of doing things.	1	2	3	4	5	6
35. I enjoy making plans for the future and working to make them a reality.	1	2	3	4	5	6
36. In many ways, I feel disappointed about my achievements in my life.	1	2	3	4	5	6
37. People would describe me as a giving person, willing to share my time with others.	1	2	3	4	5	6
38. It's difficult for me to voice my own opinions on controversial matters.	1	2	3	4	5	6
39. I am good at juggling my time so that I can fit everything in that needs to be done.	1	2	3	4	5	6
40. For me, life has been a continuous process of learning, changing, and growth.	1	2	3	4	5	6
41. I am an active person in carrying out the plans I set for myself.	1	2	3	4	5	6
42. My attitude about myself is probably not as positive as most people feel about themselves.	1	2	3	4	5	6

Circle the number that best describes the degree to which you agree or disagree with each statement.	Strongly Disagree	Disagree	Disagree Slightly	Agree Slightly	Agree	Strongly Agree
43. I have not experienced many warm and trusting relationships with others.	1	2	3	4	5	6
44. I often change my mind about decisions if my friends or family disagree.	1	2	3	4	5	6
45. I have difficulty arranging my life in a way that is satisfying to me.	1	2	3	4	5	6
46. I gave up trying to make big improvements or change in my life a long time ago.	1	2	3	4	5	6
47. Some people wander aimlessly through life, but I am not one of them.	1	2	3	4	5	6
48. The past has its ups and downs, but in general, I wouldn't want to change it.	1	2	3	4	5	6
49. I know that I can trust my friends, and they know they can trust me.	1	2	3	4	5	6
50. I judge myself by what I think is important, not by the values of what others think is important.	1	2	3	4	5	6
51. I have been able to build a home and a lifestyle for myself that is much to my liking.	1	2	3	4	5	6
52. There is truth to the saying that you can't teach an old dog new tricks.	1	2	3	4	5	6
53. I sometimes feel as if I've done all there is to do in life.	1	2	3	4	5	6
54. When I compare myself to friends and acquaintances, it makes me feel good about who I am.	1	2	3	4	5	6

Shortened General Attitude and Belief Scale (SGABS)

Here are a set of statements which describe what some people think and believe. Read each statement carefully and decide how much you agree or disagree with it.

If you STRONGLY AGREE with the statement circle number 5
If you AGREE 4
If you are NEUTRAL 3
If you DISAGREE 2
If you STRONGLY DISAGREE 1

There are no right or wrong answers. Only you can tell what you really believe so please mark the way you really think. Circle the number which shows your agreement or disagreement with each statement. Please try to answer each question.

Example:	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
People should never break a promise	1	2	3	4	5

The person has shown that he/she agrees with the statement by circling number 4. If the person had strongly agreed with the statement he/she would have circled number 5.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. It's unbearable to fail at important things, and I can't stand not succeeding at them.	1	2	3	4	5
2. I can't stand a lack of consideration from other people, and I can't bear the possibility of their unfairness.	1	2	3	4	5

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
3. It's unbearable being uncomfortable, tense or nervous and I can't stand it when I am.	1	2	3	4	5
4. I have worth as a person even if I do not perform well at tasks that are important to me.	1	2	3	4	5
5. I can't stand being tense or nervous and I think tension is unbearable.	1	2	3	4	5
6. It's awful to be disliked by people who are important to me, and it is a catastrophe if they don't like me.	1	2	3	4	5
7. If important people dislike me, it is because I am an unlikable bad person.	1	2	3	4	5
8. When I am treated inconsiderately, I think it shows what kind of bad and hopeless people there are in the world.	1	2	3	4	5
9. If I am rejected by someone I like, I can accept myself and still recognize my worth as a human being.	1	2	3	4	5
10. If I do not perform well at tasks that are so important to me, it is because I am a worthless bad person.	1	2	3	4	5
11. It's awful to do poorly at some important things, and I think it is a catastrophe if I do poorly.	1	2	3	4	5
12.I think it is terribly bad when people treat me with disrespect.	1	2	3	4	5
13.When people I like reject me or dislike me, it is because I am a bad or worthless person.	1	2	3	4	5

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
14. I cannot stand being treated unfairly, and I think unfairness is unbearable.	1	2	3	4	5
15. I believe that if a person treats me very unfairly they are bad and worthless.	1	2	3	4	5
16. I can't stand hassles in my life.	1	2	3	4	5
17. It's awful to have hassles in one's life and it is a catastrophe to be hassled.	1	2	3	4	5
18. I cannot tolerate not doing well at important tasks and it is unbearable to fail.	1	2	3	4	5
19. It is important that people treat me fairly most of the time, however I realize I do not have to be treated fairly just because I want to be.	1	2	3	4	5
20. If I do not perform well at things which are important, it will be a catastrophe.	1	2	3	4	5
21. It is unbearable to not have respect from people, and I can't stand their disrespect.	1	2	3	4	5
22. If important people dislike me, it goes to show what a worthless person I am.	1	2	3	4	5
23. I must be liked and accepted by people I want to like me, and I will not accept their not liking me.	1	2	3	4	5
24. I want to be liked and accepted by people whom I like, but I realize they don't have to like me just because I want them to.	1	2	3	4	5

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
25. When people who I want to like me, disapprove of me or reject me, I can't bear their disliking me.	1	2	3	4	5
26. If people treat me without respect, it goes to show how bad they really are.	1	2	3	4	5

PERCEIVED STRESS SCALE

The questions in this scale ask you about your feelings and thoughts during the last month. **In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way.**

Name _____ Date _____

Age _____ Gender (*Circle*): **M F** Other _____

0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often

1. In the last month, how often have you been upset because of something that happened unexpectedly?	0	1	2	3	4
2. In the last month, how often have you felt that you were unable to control the important things in your life?	0	1	2	3	4
3. In the last month, how often have you felt nervous and "stressed"?	0	1	2	3	4
4. In the last month, how often have you felt confident about your ability to handle your personal problems?	0	1	2	3	4
5. In the last month, how often have you felt that things were going your way?	0	1	2	3	4
6. In the last month, how often have you found that you could not cope with all the things that you had to do?	0	1	2	3	4
7. In the last month, how often have you been able to control irritations in your life?	0	1	2	3	4
8. In the last month, how often have you felt that you were on top of things?	0	1	2	3	4
9. In the last month, how often have you been angered because of things that were outside of your control?	0	1	2	3	4
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	0	1	2	3	4

Functional Dimensions of Coping (FDC) Scale

This section concerns the behaviours you adopted in attempting to deal with the major stressor you described above. There are many different ways of dealing with stress. In the space provided below I would like you to give a brief description of those activities and/or thoughts you used in attempting to deal with the event described above.

_____

_____

We would now like you to provide ratings of these activities and/or thoughts by circling the appropriate number on the following scales.

To what extent did this/these activities

	Not at all						**Very much so**
1) Allow you to directly deal with the problem?	0	1	2	3	4	5	6
2) Help you to find meaning and understand from the situation?	0	1	2	3	4	5	6
3) Allow you to manage the distress and upset caused by the event?	0	1	2	3	4	5	6
4) Allow you to grow and develop as a person?	0	1	2	3	4	5	6
5) Help you to divert your attention away from the problem?	0	1	2	3	4	5	6
6) Allow you to handle any anxiety caused by the event?	0	1	2	3	4	5	6
7) Provide you with information useful in solving the problem?	0	1	2	3	4	5	6
8) Allow you to deny that anything was wrong?	0	1	2	3	4	5	6
9) Enable you to deal with any emotional upset caused by the event?	0	1	2	3	4	5	6

To what extent did this/these activities

	Not at all						Very much so
10) Allow you to understand something of the nature of the problem, from which you could attempt to deal directly with it?	0	1	2	3	4	5	6
11) Allow you to avoid having to dealing directly with the situation?	0	1	2	3	4	5	6
12) Allow you to learn more about yourself and others?	0	1	2	3	4	5	6
13) Distract you from thinking about the problem?	0	1	2	3	4	5	6
14) Help you to think about the problem in a new and useful way?	0	1	2	3	4	5	6
15) Allow you a more optimistic outlook on the future?	0	1	2	3	4	5	6
16) Allow you to step back and look at the problem, in a different way, such that it seemed better?	0	1	2	3	4	5	6

BIS/BAS scales

Each item of this questionnaire is a statement that a person may either agree with or disagree with. For each item, indicate how much you agree or disagree with what the item says. Please respond to all the items; do not leave any blank. Choose only one response to each statement. Please be as accurate and honest as you can be. Respond to each item as if it were the only item. That is, don't worry about being "consistent" in your responses. Choose from the following four response options:

1 = very true for me

2 = somewhat true for me

3 = somewhat false for me

4 = very false for me

1. A person's family is the most important thing in life.
2. Even if something bad is about to happen to me, I rarely experience fear or nervousness.
3. I go out of my way to get things I want.
4. When I'm doing well at something I love to keep at it.
5. I'm always willing to try something new if I think it will be fun.
6. How I dress is important to me.
7. When I get something I want, I feel excited and energized.
8. Criticism or scolding hurts me quite a bit.
9. When I want something I usually go all-out to get it.
10. I will often do things for no other reason than that they might be fun.
11. It's hard for me to find the time to do things such as get a haircut.
12. If I see a chance to get something I want I move on it right away.
13. I feel pretty worried or upset when I think or know somebody is angry at me.
14. When I see an opportunity for something I like I get excited right away.
15. I often act on the spur of the moment.
16. If I think something unpleasant is going to happen I usually get pretty "worked up."
17. I often wonder why people act the way they do.
18. When good things happen to me, it affects me strongly.
19. I feel worried when I think I have done poorly at something important.
20. I crave excitement and new sensations.
21. When I go after something I use a "no holds barred" approach.
22. I have very few fears compared to my friends.
23. It would excite me to win a contest.
24. I worry about making mistakes.

SELF-EVALUATION QUESTIONNAIRE STAI Form Y-1

Please provide the following information:

Name_____Date_____S_____

Age_____ Gender (*Circle*) **M** **F** T_____

DIRECTIONS:

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right* now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	1	2	3	4
2. I feel secure	1	2	3	4
3. I am tense	1	2	3	4
4. I feel strained	1	2	3	4
5. I feel at ease	1	2	3	4
6. I feel upset	1	2	3	4
7. I am presently worrying over possible misfortunes	1	2	3	4
8. I feel satisfied	1	2	3	4
9. I feel frightened	1	2	3	4
10. I feel comfortable	1	2	3	4
11. I feel self-confident	1	2	3	4
12. I feel nervous	1	2	3	4
13. I am jittery	1	2	3	4
14. I feel indecisive	1	2	3	4
15. I am relaxed	1	2	3	4
16. I feel content	1	2	3	4
17. I am worried	1	2	3	4
18. I feel confused	1	2	3	4
19. I feel steady	1	2	3	4
20. I feel pleasant	1	2	3	4

SELF-EVALUATION QUESTIONNAIRE

STAI Form Y-2

Name_____ Date_____

DIRECTIONS

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
21. I feel pleasant	1	2	3	4
22. I feel nervous and restless	1	2	3	4
23. I feel satisfied with myself	1	2	3	4
24. I wish I could be as happy as others seem to be	1	2	3	4
25. I feel like a failure	1	2	3	4
26. I feel rested	1	2	3	4
27. I am "calm, cool, and collected"	1	2	3	4
28. I feel that difficulties are piling up so that I cannot overcome them	1	2	3	4
29. I worry too much over something that really doesn't matter	1	2	3	4
30. I am happy	1	2	3	4
31. I have disturbing thoughts	1	2	3	4
32. I lack self-confidence	1	2	3	4
33. I feel secure	1	2	3	4
34. I make decisions easily	1	2	3	4
35. I feel inadequate	1	2	3	4
36. I am content	1	2	3	4
37. Some unimportant thought runs through my mind and bothers me	1	2	3	4
38. I take disappointments so keenly that I can't put them out of my mind	1	2	3	4
39. I am a steady person	1	2	3	4
40. I get in a state of tension or turmoil as I think over my recent concerns and interests	1	2	3	4