

**CONFIRMATORY FACTOR ANALYSES OF TWO SOCIAL DESIRABILITY  
SCALES AND THE INVESTIGATION OF THEIR CONTRIBUTION TO  
MEASURES OF WELL-BEING**

by

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## **ABSTRACT**

The relations between social desirability bias and happiness and depression were experimentally investigated to determine if the stated goals of Positive Psychology may be compromised by social desirability contamination of subjective well-being measures. In addition, the factor structures of two widely used social desirability measures were assessed. Participants included 201 undergraduate university students enrolled in psychology classes at the University of British Columbia, Okanagan. Participants rated their happiness with the Faces Scale, Subjective Happiness Scale, Oxford Happiness Questionnaire-Short Form (OHQ-SF), and Satisfaction With Life Scale, and rated their depression with the Center for Epidemiologic Studies-Depression Scale. Social desirability was assessed with the Marlowe-Crowne Social Desirability Scale and the Balanced Inventory of Desirable Responding-Version 6 (BIDR-6). The experimental manipulation consisted of two levels of privacy instructions (confidentiality vs. anonymity) and three levels of emotionally focussed instructions (happy, sad, neutral), intended to influence scores on the happiness, depression, and social desirability measures. Confirmatory factor analyses (CFAs) revealed that neither of the social desirability scales conformed to their proposed one- and two-factor structures, respectively. Multiple regression analyses revealed that although the social desirability measures accounted for between 5-11% of the variance in the happiness and depression measures, only the BIDR-6 contributed significant unique variance, and then only to the OHQ-SF. The results from the multivariate analysis of variance showed that the experimental manipulation had no effect on respondents' scores. The results suggest that social desirability bias plays only a minimal role in measures of happiness and depression,

paralleling previous research. Thus, the goals of Positive Psychology appear not to be compromised. However, the results from the CFAs strongly suggest that this conclusion should be viewed with caution; the construct of social desirability is in need of further elucidation and the factor structures of the two most widely used measures of social desirability are in need of further confirmation. Implications and suggestions for future research are discussed.

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## **DEDICATION**

For Sheila Lewis. You have made the last three years worthwhile. Also, for reason, science, and intellectual freedom. It was a long journey to get to this point, and all three have radically changed my life for the better. Tibimet Cogitate.

## **1. Introduction**

Psychological research has traditionally focussed on dysfunction, mental illness, and negative disposition (Carr, 2004; Seligman, 2002). Relatively recently research has shown an increased emphasis on the investigation of factors, such as happiness, hypothesized to contribute to positive functioning (Carr, 2004; Myers, 1992; Seligman, 2002; Seligman, Steen, Park, & Peterson, 2005). For instance, enhancing happiness is associated with improvements in numerous facets of life commonly thought to contribute to a fulfilling existence, including health, productivity, longevity, and social life (Argyle, 2001; Carr, 2004; Seligman, 2002). Because research suggests that positive psychological states exert more influence on health than negative states (Lai et al., 2005), it may be important for the overall health of a population to encourage positive states, in addition to treating negative ones. It is therefore valuable to develop a deeper understanding of the factors that may contribute to positive psychological states. Indeed, Seligman et al. (2005) argue that the scientific investigation of what is right with people deserves as much attention as has previously been, and is currently, paid to the investigation of what is wrong with people.

Positive Psychology, as this field of research is now called (Carr, 2004; Seligman, 2002), has three main thrusts: 1) understanding and explaining subjective well-being, including happiness, 2) discovering the factors that impact subjective well-being, including happiness, and 3) promoting and enhancing subjective well-being, including happiness, rather than merely rectifying dysfunction and deficit (Carr, 2004). Although these aims are a valuable complement to psychological research, these aims may be compromised by socially desirable responding (SDR). However, in order to understand

how the aims of Positive Psychology may be compromised by SDR and the potential consequences of such a compromise, it is imperative that the reader first understands how happiness is defined and measured, what happiness research has shown us thus far, how SDR is defined and measured, what SDR research has shown us thus far, and why it is important to study happiness in relation to SDR.

### **1.1 Defining Happiness**

As is true of many psychological constructs, researchers have struggled to reach a consensus concerning the definition of happiness. This is hardly surprising as a standard definition of happiness has also eluded Western philosophers and religious figures for thousands of years (see for example Aristotle, Epicurus, and the Bible: Aristotle, trans. 1990; Hakim, 2001; Mann, 1990; The New English Bible). Amongst researchers, happiness has variously been described as the presence of positive affect while negative affect is absent (Argyle, 2001), as a balance of positive and negative hedonic values (Schimmack, 2003), as the state of being brought on by the experience of pleasure, engagement, and meaning in one's life (Seligman et al., 2005), or as an overarching satisfaction with one's life (Huebner, 1991). The following is a brief overview of the literature concerning the conceptualization of happiness. It relies heavily, but not exclusively, on the work of Klassen (2008), a colleague in the laboratory from which the current study was conducted, and provides the rationale for the definition of happiness used in the current study.

A main problem with defining happiness is that happiness is often seen as too vague or broad a concept (Lyubomirsky, Sheldon, & Schkade, 2005), and therefore, the concept is often divided into a variety of components. For instance, there appears to be

cognitive, affective, subjective (Lyubomirsky, Sheldon, et al., 2005), and biological factors (Lykken & Tellegan, 1996) that all contribute to individuals' assessments of their happiness. Unfortunately, each component is assessed using different measures, making an investigation of the overall concept of happiness difficult. Further complicating the matter is that some researchers often use the terms *happiness*, *life-satisfaction*, and *subjective well-being* interchangeably (see for example Pavot, Diener, & Fujita, 1990; Stokes & Frederick-Recascino, 2003; Swinyard, Kau, & Phua, 2001), while others argue that the constructs are unique, and consequently have independent predictors and correlates (see for example Harvey, Bond, & Greenwood, 1991; Hayes & Joseph, 2003; McLanahan & Adams, 1989).

Unfortunately, both views may be too simplistic. Studies suggest that the concepts (i.e., happiness, subjective well-being, and life-satisfaction) are neither mutually exclusive nor interchangeable. For example, Efklides, Kalaitzidou, and Chankin (2003) showed that life-satisfaction and subjective well-being were not influenced by variables such as positive and negative affect, gender, and having children, but happiness was. In addition, numerous studies strongly suggest that although the constructs may be separable, they are also highly related. For instance, Lyubomirsky and Lepper (1999) state that subjective well-being is typically used in the literature as a broader definition of happiness, and indeed, Huebner, Suldo, Smith and McKnight (2004) showed that subjective well-being is the most global concept of the three. However, Diener, Suh, Lucas, and Smith (1999) demonstrated that life-satisfaction is an essential component of subjective well-being. Finally, Schimmack (2003) and Huebner et al. (2004) reported that both subjective well-being and life-satisfaction are underscored by an affective component, happiness. Thus,

conceptualizations of happiness may be more accurate and comprehensive if, on the one hand, they acknowledge the interrelatedness of the three constructs while, on the other hand, they acknowledge the unique aspects of each construct.

Another challenge facing happiness researchers involves the debate concerning the stability of happiness. This has implications both for our conceptualization and understanding of happiness, as well as for research on strategies to enhance happiness. Converging streams of evidence strongly suggest that happiness is largely stable. For instance, the hedonic treadmill theory proposed by Brickman and Campbell (1971) suggests that humans quickly adapt to most situations, both negative and positive, and relatively quickly return to neutrality. Because of this, the authors claim that any attempts to lastingly increase happiness are futile, and therefore, the pursuit of happiness is hopeless. In one of the most cited studies on the topic, a highly positive event (i.e., winning a lottery) did not lead to significant differences in happiness levels for winners compared to a control group, and conversely, those who experienced a highly negative event (i.e., paraplegia due to injury), were only slightly less happy (Brickman, Coates, & Janoff-Bulman, 1978).

The hedonic treadmill theory was also supported by several other studies (e.g., Diener & Lucas, 1999; Lucas, Clark, Georgellis, & Diener, 2003; Myers, 2000). For example, less than 20% of the variance in happiness is predicted by all demographic variables (Campbell, Converse, & Rodgers, 1976) and in the United States, happiness and income have a low correlation ( $r = .13$ ) (Diener, Sandvick, Seidlitz, & Diener, 1993). Longitudinal studies have also shown support for the hedonic treadmill. For instance, Suh,

Diener, and Fujita (1996) showed that happiness was only temporarily (i.e., 2 months) affected by negative or positive events.

However, decades of research have shown that at least part of the hedonic treadmill theory is wrong (Diener, Lucas, & Scollon, 2006), largely due to the finding that most people, all over the world, are happy most of the time (Diener & Diener, 1996). Indeed, 80% of respondents to a recent World Values Survey (European Values Study Group & World Values Survey Association as cited in Diener et al., 2006) indicated that they were either quite happy or very happy. In addition, subsequent research on those suffering spinal chord injuries (Silver as cited in Lucas et al., 2003) has shown that although those who suffer spinal chord injuries are initially very unhappy, their happiness levels increase so rapidly that only 8 weeks later, they rate themselves above the midpoint, or neutral point, on a happiness measure.

Thus, the research strongly suggests that although we may adapt to situations and return to a baseline of well-being, that baseline is almost certainly positive, not neutral (Diener et al., 2006). These findings led researchers to develop a new, more specific theory: the set point theory of happiness (Lucas et al., 2003). The set point theory posits that there are individual differences in well-being levels, and that genes, and to a smaller extent a random component, are responsible for a lifelong “set point” of happiness. While life events can influence happiness levels in either direction, this influence is only temporary, and the set point of happiness is eventually, and inevitably, returned to (Diener & Diener, 1995). Thus, both the hedonic treadmill and set point theories of happiness claim that happiness can not be enduringly changed.

However, recent research strongly suggests that both the hedonic treadmill and set point theories may, at least in part, be wrong (see Diener et al., 2006; Lyubomirsky, Sheldon, et al., 2005; Seligman et al., 2005). Interest in Positive Psychology has helped expand research on psychological interventions to include the empirical investigation of programs designed to increase positive functioning (i.e., happiness) (e.g., Lyubomirsky, Sheldon, et al.; Seligman et al., 2005). Unfortunately, a review of the scientific literature reveals that only a handful of studies within the last several decades have empirically assessed the efficacy of interventions purported to increase happiness (see for example, Fava, 1999; Fava, Rafanelli, Cazzaro, Conti, & Grandi, 1998; Fava et al., 2004; Fordyce, 1977, 1983; Lyubomirsky, Sheldon, et al., 2005; Reich & Zautra, 1981; Sheldon & Lyubomirsky, 2006). However, the results, starting with the initial studies, are impressive. For example, Fordyce (1977, 1983) and Lichter, Haye, and Kammann (1980) showed that in as little as 2 to 10 weeks people could increase their happiness by 25%. Recently, Seligman et al. (2005) conducted one of the most scientifically rigorous investigations of such interventions to date. They showed that 3 of 5 tested interventions increased participants' happiness and decreased depression up to 6 months postintervention, compared to a placebo-controlled group.

In addition, life events can lead to long-term changes in subjective well-being levels, and therefore, complete adaptation may be avoidable in some situations (Headey, Schupp, Tucci, & Wagner, 2008; Lucas, 2007). For instance, Lucas (2007) found that while individuals generally adapt to marriage, and even the death of a spouse, unemployment, divorce, and serious disability can lead to permanent and significant decreases in happiness levels. However, there is also evidence that complete adaptation to



marriage and widowhood is rare. For example, Lucas et al., (2003) found that they could correctly predict 80% of the long-term reactions to marriage based on participants' initial reactions to marriage. Years later, those who initially exhibited increases in happiness as a result of marriage were still somewhat happier, while the converse was also true. In addition, even 8 years after widowhood, complete adaptation was uncommon. Moreover, using data from the German Socio-Economic Panel Survey, the oldest extant panel survey to collect data on life-satisfaction (Wagner, Frick, & Schupp, 2007), Headey et al. (2008) found that those who became more religious over time reported long-term increases in life-satisfaction, while those who became less religious reported long-term decreases. Finally, Diener et al. (2006) reported individual differences in the degree of adaptation people experience, suggesting the hedonic treadmill and set point theories are too simplistic.

Perhaps the most compelling evidence for both the stability and malleability of happiness levels comes from twin and adoption studies. These studies attempt to determine the amount of happiness or subjective well-being that can be accounted for by genetics. For instance, Tellegen et al. (1988) found that 48% of the variance in subjective well-being was accounted for by genetics in a study of identical and fraternal twins reared together and apart. However, over a 5-year period the stability of subjective well-being was only 67%, suggesting that genes accounted for 72% (48/67) of the stable component. Subsequent research by Lykken and Tellegen (1996) showed that the heritability of the stable component of happiness and subjective well-being may be as high as 80%. Several other studies corroborate the heritability of happiness, with 50% of the variance being accounted for by genetics being the more widely accepted figure (e.g., Braungart, Plomin,

DeFries, & Fulker, 1992; Diener et al., 1999; Sheldon & Lyubomirsky, 2004; Tellegen et al., 1988). However, some recent research suggests that the stable component of happiness may only account for approximately 34% - 38% of the variance in happiness (Lucas & Donnellan, 2007). Nonetheless, all of the evidence indicates that approximately 34% - 50% of happiness is stable, and that approximately 72% - 80% of that stability is genetically determined. However, of the estimated 50% of the variance in happiness not accounted for by a stable factor, at least two reviews of the literature indicate that circumstances (i.e., incidental but relatively stable facts of one's life, such as geographic and cultural region of residence, gender, age, religious affiliation, personal history, income, and marital status, for a full review see Diener et al., 1999) account for only 10% of that variance (Argyle, 1999; Diener et al., 1999), suggesting that as much as 40% of the variance in happiness may be malleable, and therefore, alterable through intentional efforts (Lyubomirsky, Sheldon, et al., 2005). Hence, it appears that happiness is both stable and malleable. Because happiness is comprised of both stable and changeable components, overall happiness levels may be lastingly influenced by external events (e.g., Seligman et al., 2005), individual differences in adaptation (Diener et al., 2006), and intentional efforts to improve happiness (Lyubomirsky, Sheldon, et al., 2005; Seligman et al., 2005).

Currently, happiness and subjective well-being are generally understood to refer to a combination of frequent positive affect, positive states, and satisfaction with life, with infrequent, but appropriate, experiences of negative affect (Argyle, 2001; Carr, 2004; Lyubomirsky, King, & Diener, 2005; Lyubomirsky, Sheldon, et al., 2005; Myers, 1992; Seligman et al., 2005). However, in light of the literature, for the purposes of this study,

happiness is defined as a partially heritable and relatively stable positive affective trait that underscores life-satisfaction and subjective well-being. In other words, although happiness levels are partially genetic and, therefore, stable, happiness is the experience of frequent positive affect, infrequent, but appropriate, negative affect, high life-satisfaction, and also an overall positive subjective evaluation.

## **1.2 Measuring Happiness**

Happiness is measured in a variety of ways due to the lack of consensus amongst researchers concerning its definition and the lack of an adequate or appropriate happiness measure (Lyubomirsky & Lepper, 1999). Most studies of happiness rely on self-reports (Lyubomirsky & Lepper, 1999), but are sometimes accompanied with reports from knowledgeable others (e.g., parents, friends, and spouses) (Pavot & Diener, 1993) or from interviews conducted by trained clinicians (Diener, 1994). According to Myers and Diener (1995) and Lyubomirsky, Sheldon, et al. (2005), happiness is foremost a subjective phenomenon, and therefore, self-reports are important and valid because each individual is the final arbiter of his or her own happiness. However, peer and spouse reports of well-being show convergent validity with self-reports (Lyubomirsky & Lepper, 1999; Lyubomirsky, Sheldon, et al., 2005; Myers & Diener, 1995; Sandvik, Diener, & Seidlitz, 1993), as do peer and spouse reports of smiling behaviour (e.g., Harker & Keltner, 2001) and physiological responses (e.g., Lerner, Taylor, Gonzalez, & Stayn as cited in Lyubomirsky, Sheldon, et al., 2005). Thus, self-reports have been corroborated by knowledgeable others, strongly suggesting that self-reports are reliable and valid.

There are numerous types of self- and other-report measures of happiness in use today. Single-item measures are common, but are often only one component of a study,

and are therefore often embedded within surveys asking numerous questions on a variety of topics. Single-item measures are most often used to assess general, or an overall enduring, happiness (see for example Andrews & Withey, 1976; Cantril, 1965), but have also been used to assess momentary happiness (see for example Fordyce, 1988; Holder & Coleman, 2008), and have been shown to be both reliable and valid (Harry, 1976; Stull, 1988; Swinyard et al., 2001).

In addition to single-item measures, there are many multi-item measures of happiness (see for example Bradburn, 1969; Hills & Argyle, 1998, 2002; Kozma & Stones, 1980; Lyubomirsky & Lepper, 1999). In fact, multi-item measures are the most common form of happiness assessment tool in research. According to Lyubomirsky and Lepper (1999), Bradburn's (1969) Affect Balance Scale, a multi-item measure of the balance of positive and negative affect experienced over 4-weeks, is the most commonly used measure of happiness. Typically, participants are administered a multi-item measure and respond to each item, often using a Likert-type scale (e.g., 1 [*strongly disagree*] to 7 [*strongly agree*]).

Another method of assessing happiness, called experiential research (e.g., Csikszentmihalyi & Hunter, 2003; Schimmack, 2003) has also been used, but is less common than multi-item self- and other-reports. In the Experience Sampling Method, participants are occasionally and randomly paged throughout the day to obtain samples of current moods and activities (Csikszentmihalyi & Hunter, 2003). In the Day Reconstruction Method (Khaneman, Krueger, Schkade, Schwarz, & Stone, 2004) respondents mentally review their previous day and try to recall exactly what they were doing and feeling hour by hour. While both of these techniques are valid and reliable

measures of happiness, both are designed to assess momentary and daily fluctuations in happiness, whereas the present study was designed to assess global happiness.

A relatively new happiness assessment technique is the use of biological tools to corroborate self- and other-reports. However, although there is an extensive and productive literature on the physiological correlates of stress and depression, there is relatively little literature on the physiological correlates of subjective well-being, including happiness. In fact, research identifying the biological markers for subjective well-being is in its infancy and results are not clear. For instance, a positive correlation between prolactin response to fenfluramine administration (fenfluramine increases prolactin in the blood and is an indirect measure of central serotonin (5-HT) activity) and positive affect assessed using the Positive and Negative Affect Schedule has been reported (Flory, Manuck, Matthews, & Muldoon, 2004). However, the predicted converse correlation between prolactin response and negative affect was not found. This suggests that although a decline or dysfunction in 5-HT functioning may show an absence of positive affect, it may not indicate the presence of negative affect.

However, Zald and Depue (2001) reported an inverse correlation between prolactin response and both positive and negative affect. This finding is in contrast to extensive research showing that increasing 5-HT through the administration of selective serotonin reuptake inhibitors improves positive affect in both depressed and non-depressed people (Anderson & Tomenson, 1994; Barge-Schaapveld, Nicolson, van der Hoop, & DeVries, 1995), and that positive affect decreases with a concurrent decline in 5-HT for normal healthy women and normal males with a family history of major affective disorder (Ellenbogen, Young, Dean, Palmour, & Benkelfat, 1999; Moore et al., 1998).

There are further puzzling results. Two recent studies (Duffy et al., 2006; Williams, Stewart-Knox, Helander, McConville, Bradbury, & Rowland, 2006) demonstrate that assessments of whole-blood 5-HT, as opposed to indirect indices such as prolactin, are also positively correlated with positive affect, but are unrelated to negative affect. However, both studies are limited by their samples, and therefore, studies using larger and more diverse populations may produce clearer results.

Similarly conflicting or inconclusive results have been found with dopamine. Although dopamine is widely recognized as an integral part of the reward pathway and feelings of pleasure (Berridge & Robinson, 1998; Bressan & Crippa, 2005; Esch & Stefano, 2004), relatively little research exists specifically looking at the link between dopamine and happiness or subjective well-being, and it is only relatively recently that researchers have begun to investigate this proposed relation. However, some studies do show a positive correlation between dopamine levels and positive affect. For example, Depue and Collins (1999) reported that dopamine plays a central role in the expression of the personality trait *extraversion*, which is itself closely associated with strong positive affect and happiness (e.g., Cheng & Furnham, 2003; Costa & McCrae, 1980, 1984; Diener & Seligman, 2002). Thus, dopamine's potential connection to happiness and subjective well-being appears to be a complex one that deserves further investigation. Nonetheless, although the use of biological techniques in the investigation of happiness is warranted and shows great promise, their use is beyond the scope of the present study.

Though there is no single widely accepted measure or even method in use to assess happiness, leaders in the field have argued that using multiple measures of happiness and subjective well-being is important to capture the multifaceted nature of

both constructs (Diener, Sandvik, Pavot, & Gallagher, 1991; Diener & Seligman, 2004). If happiness is comprised of several related components, multiple measurement tools may be required to adequately assess it, and this has been a standard practice. For example, a meta-analysis by DeNeve and Cooper (1998) reported that multiple measures of subjective well-being were used in 91% of studies comparing subjective well-being to variables of interest. Thus, the current study employed multiple self-reported measures of subjective well-being and happiness, which are described in the Methods section.

### **1.3 The Importance of Happiness**

The contemplation of the causes of and the attempt to attain happiness have been human pre-occupations for thousands of years. This is clear from the writings of early Western philosophers, including the preSocratics (Hakim, 2001), Socrates (Hakim, 2001), Aristotle (trans. 1990; Hakim, 2001), and Epicurus (Hakim, 2001; Mann, 1990), as well as ancient religious figures including King Solomon (The New English Bible) and the Buddha (Bowker, 1997a, 1997b). This pre-occupation continues today, as is apparent from the contemporary glut of self-help books, programs, and gurus, prevalent throughout many societies. In addition, cross-cultural research with hundreds of thousands of participants shows that a happy life is one of the most desirable goals (Diener, Suh, Smith, & Shao, 2005). Moreover, parents all over the world report that their primary desire for their children, is for them to be happy (Diener & Lucas, 2004). Indeed, happiness is of such importance that the United States included the pursuit of happiness in their Declaration of Independence as an unalienable right of all human beings (Declaration of Independence, 2008). Despite the interest in happiness through the ages, relatively little is known about how to attain or lastingly increase happiness (Seligman et al., 2005).

However, regardless of the paucity of empirical knowledge in this area, people generally “know” when they are happy (Lyubomirsky, Sheldon, et al., 2005), and relatively recently research has begun to confirm that there are a plethora of reasons to believe that, in general, being happy is good, both for individuals and society.

Using meta-analytic techniques, Lyubomirsky, King, et al. (2005) provided a general overview of the research on happiness. Many researchers assume that success leads to happiness (Lyubomirsky, King, et al.). However, the authors determined that the reverse is also true. They conducted a comprehensive analysis of the literature on subjective well-being and happiness, and included 225 scientific papers, comprised of 293 samples and over 275,000 participants, which yielded 313 effect sizes. Lyubomirsky, King, et al. reviewed evidence from cross-sectional correlational research, as well as longitudinal and experimental research in a variety of life domains, such as health, creativity and problem solving, likeability and cooperation, work life, social relationships, pro-social behaviour, and negotiation and conflict resolution, among others.

Correlational research is important because it documents associations between happiness and the variables of interest, and despite the inability to conclusively determine causality, correlations combined with theoretical and logical thinking can lend support to a causal model (Lyubomirsky, King, et al., 2005). For instance, it is impossible that the well-known positive correlation between suicide and depression supports a model hypothesizing that suicide *causes* depression. Proposed models of causation are supported when the correlations are strong, and the lack of correlation between two variables suggests no causality can be inferred (Lyubomirsky, King, et al.). Thus, correlational research plays an important role in our understanding of happiness.



Longitudinal research is generally more informative about causal direction than correlational research in that causal hypotheses can be tested and rejected (Lyubomirsky, King, et al., 2005). For instance, if changes in variable X precede changes in variable Y, and variable Z, another potential causal variable, is controlled for, researchers can be more certain of a proposed causal direction (Lyubomirsky, King, et al.). Thus, longitudinal research also plays an important role in our understanding of the potential causes and consequences of happiness. However, there is always the danger that the influence of other, unaccounted for, variables may contaminate the conclusions from longitudinal studies. Thus, experimental research is widely believed to represent the strongest evidence for causal direction because researchers can manipulate the variables of interest while controlling the influence of potentially confounding variables (Lyubomirsky, King, et al.). This does not mean that experimental research is without limitations. However, taken together, these three forms of evidence are mutually supportive and help researchers to be much more certain in their assertions about the potential causes and consequences of happiness.

Correlational studies in the literature are by far the most numerous (Lyubomirsky, King, et al., 2005), and therefore comprise the majority of the evidence discussed. After meta-analyzing the correlational studies, Lyubomirsky, King, et al. found that when it came to work, relationships, and health, happy people were better off than their less happy counterparts. For instance, in relation to work life, the authors found that happy people are more likely to be granted job interviews, to elicit positive evaluations from superiors, and to perform their tasks better and more productively, but are less likely to suffer from burnout and to engage in counterproductive work-place behaviours. In fact, the authors

found that happy people are less likely to experience conflict and more likely to cooperate with others, an important component of both work-place harmony and group problem solving. In addition, in their review of the literature, Lyubomirsky, King, et al., cite several studies included in their meta-analyses showing that happy people are more likely to graduate from college (Frisch et al., 2004) and to enjoy their jobs (e.g., Connolly & Viswesvaran, 2000), while earning more money than their less happy peers (e.g., Diener & Biswas-Diener, 2002; Lucas, Clark, Georgellis, & Diener, 2004).

Perhaps not surprisingly, Lyubomirsky, King, et al. (2005) found that happy people are not pre-occupied with work to the exclusion of play, health, community, or social relationships, and they tend to excel in these areas as well. For instance, in relation to community involvement, happy people tended to be more willing to help others, as evidenced by their higher rates of volunteerism (Krueger, Hicks, & McGue, 2001) and more hours of volunteering (Thoits & Hewitt, 2001). With respect to social relationships, happy people have more friends and a stronger social support network than those who are less happy (see for example Diener & Seligman, 2002; Pinquart & Sörensen, 2000; Requena, 1995). Moreover, they are more satisfied with their friendships, other social interactions, and leisure activities (see for example Cooper, Okamura, & Gurka, 1992; Lyubomirsky, Tkach, & DiMatteo, 2006). Happy people are also more likely to have fulfilling and satisfying marriages, and married people are consistently shown to be happier than those who are divorced, widowed, or single (see for example Mastekaasa, 1994; Myers, 1992, 2000). In relation to health, happy people are more likely to be both physically and mentally healthy than those who are unhappy. For instance, happy people report themselves to be healthier, and indeed, they are more likely to engage in physical

activity while being less likely to smoke, abuse drugs, and eat poorly (see for example Bogner, Corrigan, Mysiw, Clinchot, & Fugate, 2001; Lyubomirsky et al. 2006; Pinquart & Sörensen, 2000; Veenhoven, 1994). Furthermore, happy people are also more likely to cope well with stress and challenge, and to score higher on measures of creativity (see for example McRae & Costa, 1986; Miller & Schnoll, 2000; Richards, 1994). Happy people are also more social, active, energetic, and more interested in learning new skills or information, and as a consequence are also more informed (see for example Csikszentmihalyi, 1999; Lebo, 1953; Lucas, 2001; Veenhoven, 1994).

Though less numerous, longitudinal research has corroborated the results from the correlational research. For instance, Lyubomirsky, King, et al.'s (2005) meta-analysis found that both long-term happiness and transient positive affect preceded many positive outcomes and indicators of flourishing, such as physical and mental health, including longevity, job satisfaction and productivity, adaptive coping, and fulfilling relationships. Experimental research also corroborated the results from the correlational research. For example, the authors found strong evidence that happiness promotes such desirable characteristics as sociability and activity, altruism, healthy bodies and effective functioning systems, successful conflict resolution, and liking of self and others. Though the evidence was weaker, it was consistent with the idea that happiness contributes to original thinking and improved performance on complex tasks.

In summary, happy people enjoy many advantages in multiple life-domains over their less happy counterparts. This is of particular importance because it may contribute to why promoting happiness may have a larger impact than rectifying dysfunction (Lai et al., 2005). However, happiness is not a panacea (Lyubomirsky, King, et al., 2005). Negative

emotions also play a vital role in our well-being. In fact, if people lack the ability to experience negative affect as an appropriate response to certain situations, happiness in these cases would be considered dysfunctional (Lyubomirsky, King, et al.). In addition, in some situations a pleasant mood or being happy may be detrimental to problem solving. For instance, in the absence of immediate feedback indicating otherwise, happy individuals tend to believe things are going well, and thus, in some contexts, less happy people may be better critical thinkers and error checkers (Mackie & Worth, 1989; Melton, 1995). Moreover, happy people tend to rely on heuristics to solve frequently encountered problems. While this is economical in many situations, if the heuristic begins to provide the wrong answer but there is no appropriate feedback, happy people tend to continue to rely on the faulty heuristic and perform more poorly than unhappy people (Lyubomirsky, King, et al.).

Some of the advantages mentioned, especially in the work-place, may be partly due to others' perceptions of happy people, perhaps sometimes granting happy people unwarranted advantages (Lyubomirsky, King, et al., 2005). For instance, happy people are much more liked, and viewed by others as more attractive, competent, intelligent, and socially skilled than their less happy peers (see for example Diener & Fujita, 1995; Diener, Wolsic, & Fujita, 1995). While there is strong evidence that happy people outperform their less happy peers, the bias in favour of happy people suggests that there is a real potential for unqualified or underqualified people to be given positions of authority, based largely on demeanour and perceived competency, rather than objective measures of competency.

Based on the evidence, on the whole, happiness appears to contribute greatly to productivity, creativity, cooperation, problem-solving, caring, and health (Lyubomirsky, King, et al., 2005). Thus, research to further our understanding of the causes and consequences of happiness and related constructs is warranted, and may play an integral role in the development of potentially better societies.

#### **1.4 Socially Desirable Responding**

Unfortunately, despite the high praise for happiness and the results of happiness research, there is reason to be concerned with the research because of response biases. Paulhus (2002 p. 49) defined *response bias* as “any systematic tendency to answer questionnaire items on some basis that interferes with accurate self-reports”. There are several forms of response biases reported in the literature. For instance, there is careless responding (Meehl & Hathaway, 1946), consistent responding (Dillehay & Jernigan, 1970), and omitting items (Cronbach, 1946), among others (Paulhus, 1991). The current study is concerned with one kind of response bias: socially desirable responding (SDR). SDR is typically characterized by the tendency of respondents using self-report questionnaires to answer in such a way as to make themselves look good, to give positive self-descriptions, often at the expense of honesty and/or accuracy (Holtgraves, 2004; Paulhus, 2002).

According to a review by Nederhof (1985), between 10% and 75% of the total variance in responses to self-reported items is accounted for by SDR, and therefore, SDR is a serious threat to the validity of self-reported data (Nederhof, 1985; Tan & Grace, 2008). In fact, SDR *has* been a concern since at least the 1930s (Vernon, 1934) and led to Meehl and Hathaway’s (1946) development of the first measures specifically designed to

detect SDR in self-reports. Since then, several measures of SDR have been developed and used in research (Paulhus, 1991).

Researchers use SDR scales for three primary reasons, with the most common use being to calculate the correlations between SDR scale scores and scores on the psychological scale of interest (Beretvas, Meyers, & Leite, 2002; Paulhus, 1991). If the correlations are low, it suggests that the scores on the scale of interest are not confounded by SDR, and thus, researchers can be more confident of their findings (Paulhus, 1991). However, in order to distinguish SDR from related constructs, Paulhus (2002) argues that SDR measures should supply ample evidence that high scores reflect a departure from reality before their general use is acceptable. Thus, Paulhus argues that SDR should be defined as the tendency to give *overly* positive self-descriptions. The current study employed the same general definition.

However, as do Jackson and Messick (1958), Paulhus (2002) differentiates between *response styles* and *response sets*. Response styles are response biases that consistently emerge over time and questionnaires, while response sets are response biases that are due to a temporary distraction or change in motivation, and are, therefore, temporary biases. Thus, whether SDR should be considered a response set, a response style, or a combination of the two needs to be addressed. As will be discussed below, individuals can give overly positive self-descriptions in more than one way, and therefore, a comprehensive definition of SDR includes additional descriptive elements. However, it is impossible to review the literature on the emergence of a definition for SDR without also reviewing the literature on the controversy surrounding the measurement and conceptualization of SDR, as they are highly related.

### 1.5 SDR Controversy: A Brief Overview

Unfortunately, despite the widespread acknowledgement of the influence of SDR on self-reports and the widespread use of SDR scales in psychological research, there are several issues which are either still debated amongst researchers or which are generally not well investigated, and so remain largely unknown (Holtgraves, 2004). First, some prominent researchers (e.g., Diener, 1984; McCrae, 1986) claim that SDR's impact on self-report measures is exaggerated and that SDR plays only a minor role in assessing subjective well-being. Furthermore, McCrae and Costa (1983) argue that rather than being a response bias, SDR reflects substantive differences in personality traits.

Closely related to this argument is the concern that SDR scales may not be valid because they may not measure social desirability. For instance, Barger (2002) asserts that the use of the Marlowe-Crowne Social Desirability Scale (MCSDS) (Crowne & Marlowe, 1960), arguably the most widely used tool to control for response bias in self-report research (Leite & Beretvas, 2005), along with nine short versions, should in fact be *discouraged* on empirical and conceptual grounds. Barger (2002) found that the adequacy of model fit across samples was inconsistent and the apparent adequacy of fit of some of the short versions of the MCSDS may have been due to statistical artefact. In addition, MCSDS scores, both alone or in combination with other measures, have predicted physiological outcomes such as cortisol levels (Brody et al., 2002) and mortality following cardiac problems (Denollet, 1999). These kinds of relations are unexpected and conceptually unexplainable from a scale intended to measure response biases to self-reported items (Barger, 2002). Thus, just how influential and widespread SDR is remains unknown (Holtgraves, 2004).

Second, there is no consensus on how SDR should be conceptualized (Holtgraves, 2004; Tan & Grace, 2008). Unfortunately, SDR has been operationalized in such a variety of ways over the years that there was a complete lack of convergence amongst them (Paulhus, 2002). Before 1984, some of the most popular measures of SDR were the Edwards Social Desirability Scale (SD) (Edwards, 1957), the previously mentioned MCSDS (Crowne & Marlowe, 1960), the Eysenck Lie Scale (Eysenck & Eysenck, 1964), and the Wiggins Sd scale (Wiggins, 1959). However, the different measures of SDR proved to be poorly correlated with one another (Paulhus, 1991; Stöber, Dette, & Musch, 2002), suggesting their originators conceptualized SDR differently. In addition, some measures were confounded. For instance, the Edwards Social Desirability Scale was confounded with psychopathology due to the content of some of its items (Crowne & Marlowe, 1960; Leite & Beretvas, 2005; Mick, 1996).

Finally, very little is known about how and when SDR functions (Holtgraves, 2004). Holtgraves suggested that there are at least two stages in the process involved in responding to self-report items: a retrieval stage where the respondent must retrieve the information requested from memory, and a judgement stage, where the respondent must choose whether or not to respond. He further suggested that there are at least three proposed mechanisms by which SDR could occur at the two stages. First, SDR could occur during the final stage, where a respondent retrieves information, formats it, and then makes a judgement about it in light of social desirability considerations. Second, when social desirability is a concern, the retrieval stage may be eliminated altogether. In this case, test-takers would supply a response based only on the implications of the answer. Finally, respondents may retrieve information in a heuristic manner, selectively retrieving



information that portrays them in a positive way while neglecting contradictory information. In a series of three experiments, Holtgraves found that social desirability primarily occurs during an evaluation stage, especially if respondents are concerned with how their responses will make them look.

Despite the controversies surrounding SDR, researchers should not be discouraged from further investigating SDR and related constructs, as it is only through further research that controversies are finally resolved. Although the present study cannot definitively resolve any of the controversies related to SDR research, it is the aim of the present study to contribute to the resolution of at least some of them.

## **1.6 Approaches to Operationalizing SDR**

Of primary concern for the present study are the debates over the conceptualization and measurement of SDR. There have been a variety of approaches to operationalizing SDR and developing SDR measures, and this has led to a lack of empirical convergence (Paulhus, 2002). The lack of convergence contributed to arguments that the construct of SDR was inadequately clarified to justify the claims that SDR contaminates self-report items, such as personality measures. However, Paulhus argued that the process of construct validation had progressed to the point where the varying approaches to the operationalization of SDR could be, and needed to be, integrated, in order to provide such a clarification. Thus, in his review, Paulhus first separated the approaches to defining SDR and developing SDR measures into three categories, explained below, before describing the development of his own SDR scale.

*1. Minimalist Constructs.* Paulhus (2002) asserts that some researchers have used over-simplified operationalizations while offering minimal theoretical justification. A

common method (e.g., Edwards, 1953; Jackson & Messick, 1961; Saucier, 1994), has been to collect social desirability ratings on a variety of items and then to construct a measure of SDR based on those items that received the highest desirability ratings (Paulhus, 2002). Paulhus explains that it is thought that those who endorse the high-desirability items, but who do not endorse the low desirability items, are responding to the items' desirability, rather than their accuracy. Edwards' (1957) SD scale, claims Paulhus (2002), is the exemplar of this approach. Measures constructed in this manner have been validated in two ways. First, diverse judges have shown consistency in the desirability ratings of the items (Edwards, 1970). Second, high intercorrelations have been found between scores on SDR scales developed using items from different domains, for example clinical problems and personality (Edwards, 1970).

A related operationalization also uses items that are endorsed as highly socially desirable to construct SDR scales, but the method through which the socially desirable items are identified differs (Paulhus, 2002). This method has been labelled role-playing (e.g., Cofer, Chance, & Judson, 1949; Wiggins, 1959), and entails assigning participants to one of two groups. One group is instructed to respond to items to maximize their appearance of being socially desirable while the second, a control group, is instructed to respond to items as accurately as possible. The SDR measure is then developed using the items that best differentiate the two groups. Wiggins' (1959) Sd scale was developed using this method, and is still used in important research over 40 years later (e.g., Dwight & Feigelson, 2000). Unfortunately, despite the apparent reasonableness of the two operationalizations (Paulhus, 2002), the two popular scales derived from these operationalizations (i.e., Edwards' SD scale and Wiggins' Sd scale), repeatedly showed

very low intercorrelations (e.g., Holden & Fekken, 1989; Paulhus, 1984). This problem is likely due to the fact that compared to the Sd scale, the SD scale's items endorsement rates were high (Paulhus, 2002). Consequently, only the Sd scale incorporated the notion of exaggerated positivity, as respondents to the Sd items must endorse many rare but desirable traits in order to obtain a high score (Paulhus, 2002).

2. *Elaborate Constructs.* Some researchers took a more theoretically oriented approach to the operationalization of SDR (Paulhus, 2002). In doing so, construct elaboration was part of the process, and therefore, specific hypotheses about the underlying construct also played a role in the development of items to be included on an SDR scale (Paulhus, 2002). Some of the most common measures of SDR were developed this way, including the MCSDS (Crowne & Marlowe, 1960, 1964) and the Eysenck Lie Scale (Eysenck & Eysenck, 1964). Measures developed in this way include the concept of exaggerated positivity by including items intended to provoke a different set of responses from honest versus socially desirable responders (Paulhus, 2002). For instance, Crowne and Marlowe (1964) considered the endorsement of items of improbable virtue and the denial of common human weaknesses to be indicative of SDR. Furthermore, Crowne and Marlowe argued that the driving force behind socially-harmonious and conforming public behaviour and high scores on their scale was a need for approval. Therefore, because of the inclusion of the theoretically driven notion of exaggerated positivity, unlike the purely empirical method, high scores were accumulated by including *improbably* positive self-descriptions, not just positive (Paulhus, 2002).

3. *Accuracy Constructs.* Some researchers have argued that those who score high on SDR scales may actually be telling the truth (e.g., Block, 1965; McCrae & Costa,

1983; Milholland, 1964). There is some evidence to support this claim. For instance, Block (1965) showed spousal reports confirmed many of the desirable positive self-descriptions on the SD scale, and McCrae and Costa (1983) similarly found that spousal reports confirmed many of the self-ascribed desirable traits of high scorers on the MCSDS scale. Block (1965) believed that high scores on the SD scale were actually desirable, because they were indicative of a positive and desirable personality syndrome he labelled *ego-resiliency*. However, Paulhus' (1998, as cited in Paulhus, 2002) investigation into Block's (1965) work suggested a degree of distortion in Block's Ego Resiliency measure. Furthermore, Millham and Jacobson (1978) showed that in order to impress experimenters, high scorers on the MCSDS scale lied and cheated. Consequently, Paulhus (2002) states that another construct, Crowne and Marlowe's (1964) *need for approval*, reconciles the seemingly conflicting results. He argues that when detection is thought to be highly unlikely, high MCSDS scorers may resort to deceit because they think it suits their purposes better, despite understanding that typically the most effective way to gain approval is by behaving in a socially conventional manner. Thus, Paulhus (2002) claims that the data show that high SDR scores indicate social desirability, and not those with desirable characters.

Paulhus (2002) showed that the best way to approach both the defining of SDR and the constructing of SDR measures is to integrate the three approaches delineated above. Thus, Paulhus argues that one must take into account the desirability of the items to be included in an SDR scale while simultaneously having a reasonable theoretical justification for including those items. Therefore, a highly endorsed item need not necessarily be included in an SDR scale if no theoretical justification can be found to

support that item's merit. Consequently, the inclusion of theory allows for a more comprehensive and coherent definition of SDR than simply compiling lists of highly endorsed items. Finally, he advocated not dismissing out of hand the possibility that high SDR scores reflect reality. Instead, based on evidence, he advocated the use of an alternate theory to explain why high SDR scores do reflect social desirability and not reality.

### **1.7 Measuring SDR: How Many Dimensions?**

Closely tied to the development of SDR scales is the dimensionality of SDR. Initially, SDR was considered unidimensional (e.g., Crowne & Marlowe, 1964; Edwards, 1957), but was then conceptualized as having two components (e.g., Cattell & Scheier, 1961; Edwards, Diers, & Walker, 1962; Wiggins, 1959). Wiggins (1964) performed factor analyses on several measures relevant to SDR and found that two clusters of items emerged, which he named *Alpha* and *Gamma*. While researchers have agreed that Gamma items reflected intentional falsification (e.g., Edwards et al., 1962; Jackson & Messick, 1962), Damarin and Messick (as cited in Paulhus, 2002) were the first to argue that Alpha items reflected an unconscious evaluative bias. Thus, it appeared that Alpha items involved self-deception, or a positive self-evaluative bias, while Gamma items reflected other-deception, or a tendency to portray oneself in a favourable way to others (Tan & Grace, 2008). Subsequent research, however (for a review see Paulhus, 1984, 2002), showed that most of the aforementioned SDR scales (e.g., Sd, SD, MCSDS) either fell completely, or at least predominantly, within one factor. For instance, Edward's (1957) SD Scale and Sackeim and Gur's Self-Deception Questionnaire loaded on Alpha, while Eysenck's Lie scale (Eysenck & Eysenck, 1964) and Sackeim and Gur's Other-Deception

Questionnaire loaded on Gamma (Paulhus, 1984, 1991), while the MCSDS (Crowne & Marlowe, 1964) loaded on both factors, but predominantly on Gamma (Paulhus, 1984, 1991). Thus, prior to 1984, the existing measures of SDR were poorly correlated with one another (Paulhus, 1991; Stöber et al., 2002) and appeared to conceptualize SDR as various incarnations of a unidimensional construct, which Paulhus (1984) argued inadequately accounted for the phenomenon.

Because the existing scales poorly reflected a two-factor model, a new SDR measure was developed that incorporated questions that tapped every possible form of other- and self-deception (Paulhus, Reid, & Murphy as cited in Paulhus, 2002). From this research, Paulhus (1984) developed the Balanced Inventory of Desirable Responding (BIDR), which is a 40-item scale equally balanced across two factors. Multiple studies and analyses confirmed the two-factor model, showing that respondents give socially desirable responses in two ways (Paulhus, 2002). First, respondents may intentionally deceive others about themselves, deliberately self-presenting a positive image. He labelled this factor of social desirability *impression management* (Paulhus, 1984, 1991). Second, respondents may unintentionally deceive others about themselves. In this case, respondents also present an overly positive image of themselves, but may actually believe this image to be true. Thus, respondents answer honestly, but answers are unconsciously positively biased. Paulhus called this factor *self-deception* (Paulhus, 1984) or *self-deceptive positivity* (Paulhus, 1991).

However, factor analyses also consistently showed that self-deception was comprised of two factors: enhancement (the promotion of positive qualities), and denial (the denial of negative qualities) (Paulhus, 2002). Thus, Paulhus partitioned self-deception

into *self-deceptive enhancement* and *self-deceptive denial*. However, self-deceptive denial and impression management both loaded onto the Gamma factor. Thus, due to the presence of both conscious and unconscious elements in the Gamma factor (remember, impression management is thought to be a conscious process while self-deceptive denial is thought to be unconscious), Paulhus was forced to re-evaluate his contention (e.g., Paulhus, 1986) that level of consciousness differentiated Alpha from Gamma. Therefore, Paulhus (2002) modified the definition of impression management to be the habitual presentation of a favourable public image, which implies that impression management may be a personality construct and may not involve conscious deception.

The self-deceptive enhancement and impression management subscales proved to be relatively uncorrelated and better reflected the two major SDR dimensions (Paulhus, 1991, 2002). For instance, Hoorens (1995) found that self-deceptive enhancement, but not impression management, predicted self-deceptive distortions, such as hindsight bias, and Paulhus, Bruce, and Trapnell (as cited in Paulhus, 2002) found that impression management, but not self-deceptive enhancement, was sensitive to instructions that requested varying degrees of self-presentation through faking. Moreover, the original self-deception items were based on psychoanalytic theory and assumed that those who are highly self-deceptive tend to deny having psychologically threatening thoughts or feelings (Paulhus, 1991). However, the more recent version of the scale, the BIDR-6, removed the psychoanalytic influence by changing the self-deception items from psychologically threatening statements to statements presenting exaggerated claims of positive cognitive attributes. Thus, Paulhus states that the focus was shifted from ego defence to ego enhancement. As a consequence, the 40-item BIDR-6, which is now one of the most

widely used SDR measures (Leite & Beretvas, 2005), includes only two factors: impression management and self-deceptive enhancement (Paulhus, 1991, 2002). The BIDR has been widely used in both research and clinical settings (Paulhus, 1984, 1991, 2002) and over 40 studies have added to its construct validity (Paulhus, 2002). Its current incarnations, as the BIDR-6 and the Paulhus Deception Scales: BIDR-7 (PDS) are for research and clinical applications respectively.

Helmes and Holden (2003) investigated the potential one- or two-factor structure of SDR by having university students complete a variety of measures either developed to assess SDR (e.g., BIDR-3, MCSDS) or relevant to SDR (e.g., self-esteem, social recognition). Depending on the criteria used in the exploratory factor analyses, results showed support for one-, two-, and three-factor solutions. However, some of the item loadings were below .40 for the one-factor solution. Therefore, Helmes and Holden asserted that a two- or three-factor solution was most appropriate. However, when the third factor was rotated, the first two factors showed little change. Thus, Helmes and Holden concluded that results best supported a two-factor model. However, their two factors differed from Paulhus'. Rather than impression management or self-deception, Helmes and Holden's (2003) model involves a need for social approval and perceived personal adjustment.

Additional complications arose when Leite and Beretvas (2005) conducted confirmatory factor analyses on full and shortened versions of both the Marlowe-Crowne and BIDR scales. They found that both the full form of the MCSDS and the impression management subscale of the BIDR were multidimensional while the self-deceptive enhancement subscale of the BIDR did fit a single factor model. This was a confirmation



of Barger's (2002) work which also showed that a multidimensional model for the MCSDS was likely more appropriate than one- or two-factor models.

To date, there is a lack of consensus on both the nature and conceptualization of SDR. However, most of the research assessing the potential structure of SDR supports the hypothesis that SDR is comprised of at least two factors: one incorporating self-deception and the other incorporating other-deception (Tan & Grace, 2008). Unfortunately, the precise nature of SDR is still unclear because there is still a lack of a common description of SDR, and factors thought to comprise SDR are variously depicted as the need for social approval and perceived personal adjustment or impression management and self- and other-deception (Tan & Grace, 2008).

The present study was designed primarily to investigate the amount of variance in happiness measures that can be accounted for by SDR when participants are assigned to either a confidentiality or anonymity condition and given information about the prevalence of either happiness or depression on self-reports in the general population and in university students. The nature and intent of this information are discussed later. As previously noted, whether SDR is comprised of one, two, or more constructs has not been definitively established, nor has the nature of the proposed constructs (Barger, 2002; Paulhus, 2002; Tan & Grace, 2008). Furthermore, despite that SDR scales are most often used to validate other psychological scales of interest, this use is tenuous because scores on SDR scales have not been properly validated (Leite & Beretvas, 2005). Thus, two methods were employed in the present study in order to combat potential problems associated with the measurement of SDR. First, the two most commonly used SDR scales, the BIDR-6 and the MCSDS, which contain the two most important competing models of

SDR (Leite & Beretvas, 2005) (i.e., Marlowe and Crowne's [1964] unidimensional need for approval and Paulhus' [1991] two-factor impression management and self-deceptive enhancement theories), were used. In this way, the amount of variance that SDR accounted for in several happiness and subjective well-being measures, as well as a depression measure, was assessed in two ways, allowing for more certainty in the conclusions drawn from the data. Second, the dimensionality of both the MCSDS and BIDR-6 was assessed using confirmatory factor analyses (CFAs). The MCSDS was assessed using a one-factor model for the full version of the scale and the BIDR-6 was assessed using two correlated factors representing impression management and self-deceptive enhancement. Thus, whether SDR is better thought of as one versus two factors was assessed in order to supply better construct validation for the competing theories.

### **1.8 SDR and Personality**

There is considerable debate over whether SDR is an intrinsic and stable response style associated with personality traits or a short-term response set determined by extrinsic factors, such as context (Tan & Grace, 2008). Tan and Grace contend the issue is of some import because each conceptualization carries with it a different set of assumptions, and therefore, different courses of action. If SDR is an enduring quality related to personality then it should be considered and treated as a substantive variable in itself. Alternatively, if SDR is not related to personality and is a distorting response bias, then the tradition of correcting for or eliminating SDR is the correct course of action. However, this dichotomous view may be too simplistic, and the real picture may involve a combination of the two.

There is considerable evidence that SDR is related to personality. For instance, a two-factor conception was supported by personality research that showed that self-esteem and ego-resiliency are associated with Alpha (i.e., self-deception), and conscientiousness and agreeableness are associated with Gamma (i.e., other-deception) (e.g., Paulhus, 2002). In addition, when comparing self-reports to spousal reports of personality, McCrae and Costa (1983) reported decreased validity when they corrected self-reports for SDR using the MCSDS or the Lie scale from the Eysenck Personality Inventory (EPI), and neuroticism provided the largest effect. In addition, high scorers on both the MCSDS and EPI Lie scales were actually better adjusted, friendlier, and more open to new experience than low scorers. Moreover, as previously noted, social approval has been implicated as an underlying motive for SDR by some researchers (e.g., Crowne & Marlowe, 1964; Holden, Starzyk, McLeod & Edwards, 2000; Meston, Heiman, Trapnell, & Paulhus, 1998).

Paulhus (1991) and others also found that self-deceptive enhancement was positively related to other personality traits. For instance, high scorers on self-deceptive enhancement showed greater illusions of control and higher self-esteem, but lower levels of depression, social anxiety, neuroticism, and empathic distress (Holden et al., 2000; Paulhus & Reid, 1991). Not surprisingly, impression management, which is generally understood to largely represent items referring to conscious lies, correlated highly with other Lie scales, such as the EPI Lie scale and Minnesota Multiphasic Personality Inventory Lie Scales (Tan & Grace, 2008). Strong evidence also comes from a recent meta-analysis which showed strong relations between impression management and self-deceptive enhancement and many of the personality dimensions of the Big Five (Li &

Bagger, 2006). However, partialling out the effects of impression management or self-deceptive enhancement did not change the criterion validity of the personality measures. Thus, as is consistent with their conceptualizations, the self-oriented deceptions may indeed be more measures of response styles, and therefore, also of personality, than bias, and impression management, because it seems to be a conscious choice sensitive to contextual demands, appears to be a response set (Tan & Grace, 2008). Consequently, the validity of self-report measures should be enhanced by controlling for impression management but not self-deceptive enhancement (or self-deceptive denial, if one chose to use this now obsolete subscale) (Paulhus, 1991, 2002). However, several studies fail to support this claim (e.g., Li & Bagger, 2006; Pauls & Stemmler, 2003). Tan and Grace (2008) offer three possible reasons for this failure: 1) the impression management scale measures something other than impression management, 2) impression management is not a response set, but is instead, like self-deceptive enhancement, an aspect of personality (as Paulhus [2002] suggested), or 3) there are flaws in the studies that controlled for impression management but found no change or a decrease in validity.

On the whole, results suggest that high scores on social desirability scales such as the MCSDS may provide substantive information about personality. However, this does not mean that SDR cannot also be, at least in part, a response set (Tan & Grace, 2008). Because SDR may be comprised of both conscious and unconscious aspects, SDR may only be traitlike (i.e., related to personality) to the extent that it is unconscious and self-deceptive (Paulhus, 1984, 2002). While at this point this is speculative, it would explain both the strong relationships between SDR scales and the Big Five, as well as the inability of general SDR scales such as the MCSDS, to correct scores for SDR in some studies

(Tan & Grace, 2008). The authors argue that this is likely because SDR scales, as well as correcting for response bias, contain some important personality information which would also be included in the correction.

### **1.9 Definition of SDR**

In light of the literature, for the purposes of this study SDR was defined as the tendency to give overly positive self-descriptions, either consciously or unconsciously, and is comprised of two factors, self-deceptive enhancement and impression management, which are related to both stable personality traits and temporary external factors, such as distractions.

### **1.10 Why SDR Research Is Important: I Am Not What I Say I Am**

Despite the concerns about the conceptualization and measurement of SDR outlined in the previous sections, research strongly suggests that SDR can threaten the validity of self-reported data (Nederhof, 1985; Paulhus, 1991). For instance, studies using corroborative evidence, such as police records and surreptitious documentation of participant behaviours, confirm that people over- and underreport some behaviours, depending on contextual factors such as the anonymity of the participants (e.g., Ong & Weiss, 2000).

Using a variety of SDR measures, this bias in self-report measures has been found in research on attitudes, psychopathology, personality traits, and behaviours (Holtgraves, 2004). For instance, people often underreport engaging in socially undesirable or criticized behaviours, such as drug use (Mensch & Kandel, 1988), intravenous drug use, anal intercourse (Latkin, Vlahov, & Anthony, 1993), and the use of prostitutes (Brewer et al., 2000). Perhaps not surprisingly, criminal offenders show differing levels of SDR,

according to their crimes. For instance, child molesters are the most likely to fake being good, but sexual offenders in general show higher levels of SDR than do violent offenders (Gudjonsson & Sigurdsson, 2000; Tierney & McCabe, 2001). Interestingly, some subpopulations tend to overreport socially undesirable behaviours. In a review of the literature on the reliability and validity of self-reports of drug use, criminality, and HIV risk-taking behaviours, Darke (1998) found that intravenous drug users tended to slightly overreport drug use and crime, as corroborated by urine tests and criminal records. However, Jansson, Hesse, and Fridell (2008) found that substance abusing women, a largely underresearched population, tended to underreport their violence charges.

Not surprisingly, the converse is also true; people overreport engaging in socially desirable behaviours such as church attendance (Hadaway, Marler, & Chaves, 1998). For instance, it has been well-publicized that over the years weekly church attendance in the United States has remained constant, at about 40% (Presser & Stinson, 1998). However, in their review of the literature, Presser and Stinson showed these data were obtained from traditional interview-administered surveys, and when methods to reduce SDR were used, weekly attendance claims dropped by approximately one third. In fact, Presser and Stinson assert that over the past several decades, studies using methods to reduce SDR show a constant *decrease* in weekly church attendance. In addition to church attendance, people tend to overreport ethical behaviour at work (Randall & Fernandes, 1991) and physical activity (Warnecke et al., 1997). Respondents also tend to overreport socially desirable attitudes, such as endorsing positive attitudes toward women and rejecting patriarchal beliefs (Burris & Jackson, 1999), but tend to underreport socially undesirable attitudes, such as a dislike of condoms (Agnew & Loving, 1998).

Finally, there are also sex differences in SDR. For example, males tend to overreport condom use (Agnew & Loving, 1998) and numbers of sexual partners (Brewer et al., 2000), while females tend to underreport engaging in premarital and extramarital sexual activity (Balk, Brown, Cruz, & Domingo, 1997; Catania, Binson, Canchola, Pollack, & Hauck, 1996; Gregson, Zhuwau, Ndlovu, & Nyamukapa, 2002). Additionally, Hebert et al. (1997) showed that men overreported their daily fat and energy intakes while women underestimated theirs.

Unless accounted for in some way, SDR in research results may invalidate researchers' conclusions because the measures used to reach those conclusions may not be valid. These faulty conclusions could in turn potentially lead to policies that negatively and long-lastingly affect unknown numbers of people. For instance, as pointed out by Hebert et al. (1997), dietary self-reports are widely used in epidemiological research on the relations between diet and health outcomes, and therefore, unless controlled for, gender differences in SDR on self-reports of diet may lead to distortions in our knowledge of the relations between nutrient exposure and disease. Unfortunately, considering that heart disease, largely related to poor diet, is the primary cause of death in the United States (Kung, Hoyer, Xu, & Murphy, 2008) and is the second leading cause of death in Canada (Statistics Canada, 2009), undetected distortions of knowledge may lead to severe consequences. Therefore, despite the controversy surrounding SDR research, continued advancement of knowledge in the area is warranted and has practical implications for important arenas of life, such as health.

### 1.11 SDR and Happiness

Although much of the research on SDR has focused on sensitive issues such as sexual practices and drug use, happiness self-reports may also be susceptible to SDR. Myers (2000) reported that 9 out of 10 people in the United States rated themselves as either *pretty happy* or *very happy*, despite the fact that 9.5% of the American population in a given year will suffer from depression (National Institute of Mental Health, 2006). Furthermore, with divorce rates of 50% in the United States (Myers, 1992) and nearing 40% in Canada (Statistics Canada, 2005), it is surprising that a majority of married couples consistently rate themselves as very happily married (Myers, 1992). In addition, many societies place an emphasis on behaving in an agreeable and pleasant manner, regardless of a person's current mood or circumstances (Eysenck, 1990). Eysenck argued that this fosters a strong cultural expectation that unhappiness is not acceptable and should be hidden, and unhappy people may attempt to imitate the behaviours of those who are genuinely happy, in order to fit in. Research on other positive socially desirable behaviours and attitudes, such as the overreporting of ethical behaviour at work (Randall & Fernandes, 1991) and church attendance (Presser & Stinson, 1998), as well as the overreporting of the rejection of patriarchal beliefs (Burris & Jackson, 1999), suggests that self-reports of happiness may also be overreported. These discrepancies raise the possibility that people may be responding to measures of happiness in a socially desirable manner.

Unfortunately, despite a long history of research on SDR (e.g., Edwards, 1957; Meehl & Hathaway, 1946), relatively few studies have investigated the relationship between SDR and the measurement of happiness. However, extant studies show



conflicting results. For example, in a study of one-hundred-and-fifty 50-82-year-olds, Kozma and Stones (1987) found that controlling for social desirability did not contribute to the construct validity of several commonly used well-being measures. Furthermore, Kozma and Stones (1988) replicated this study, extending it by using a larger sample size of 330, which included a community and clinical subpopulation, and by assigning participants to one of three age groups: 21-40, 41-60, and 61-82. Their initial findings were corroborated. Thus, they concluded that social desirability plays little, if any role, in several well-being self-report measures. In addition, in the development of the widely used Satisfaction With Life Scale (SWLS), Larsen, Diener, and Emmons (1985), and Diener, Emmons, Larsen, and Griffin (1985) also showed that their measure of subjective well-being did not correlate highly with the MCSDS ( $r = .02$ ). Finally, McRae (1986) also asserted that social desirability plays only a minor role in measures of subjective well-being.

However, Carstensen and Cone (1983) found the opposite when they demonstrated a relationship between subjective well-being and social desirability in a group of elderly respondents. Further conflicting evidence comes from more recent research by Diener and his colleagues. For example, Diener, Sandvik, Pavot, and Gallagher (1991) reported that several subjective well-being measures correlated with the MCSDS and that the measure of social desirability was a strong predictor of both self-reported and nonself-reported measures of happiness. They contend that social desirability is a personality trait that actually enhances well-being. However, the authors used a unidimensional conceptualization of SDR which does not take into account impression management. In fact, the authors acknowledge that some people may intentionally fake their responses and

that the evidence that SDR is a stable personality trait did not rule this possibility out. Thus, using other-reports to corroborate self-reports may not get around the problem of SDR in subjective well-being reports. Furthermore, they argue that the evidence that SDR is a stable personality trait is intended only to draw attention to the fact that measures originally intended to assess faking on personality measures may actually partially tap into something unintended.

In addition, Konow and Earley (2008) found that 11 of 14 well-being measures correlated significantly with the MCSDS scale, although the MCSDS scale accounted for no more than 10% of the variance in any of the well-being measures. Finally, more support for the influence of SDR on the assessment of subjective well-being and happiness comes from Hagedorn (1996). Hagedorn conducted two studies on a new measure of subjective well-being he devised called the Life Satisfaction Research Questionnaire (LSRQ). The LSRQ included a social desirability questionnaire based on Paulhus' (1984) widely used BIDR, and thus assumed a two-factor model (i.e., impression management and self-deception) of SDR. The LSRQ was able to distinguish between the satisfaction respondents felt about their circumstances and the satisfaction they felt with what they had made of their circumstances. Hagedorn found that high self-deceivers were more likely to be satisfied than low self-deceivers on almost every measure used. Thus, again SDR was correlated with a measure of subjective well-being.

In summary, measures of subjective well-being and happiness may be as subject to SDR biases as other self-report measures. Therefore, the relations between SDR and measures of subjective well-being and happiness deserve further investigation.

### **1.12 Controlling for SDR**

The findings that SDR varies as a function of how the scales are administered has led to several methods to control for SDR in self-reports (Nederhof, 1985; Ong & Weiss, 2000; Paulhus, 1991). These methods can be grouped into four categories: rational, factor analytic, covariate, and demand reduction (Paulhus, 1991). The present study is concerned with the potential effects of an experimental manipulation of the awareness of emotions and perceived levels of privacy, and focused on one of these methods: demand reduction.

Demand reduction consists of several techniques used to reduce the perceived situational stress to respond in a socially desirable way (Paulhus, 1991). Techniques shown to lower SDR include perceived and real anonymity (Durant, Carey, & Schroder, 2002; Ong & Weiss, 2000), separating respondents, and having respondents seal questionnaires in a provided envelope and dropping them into a box when finished (Paulhus, 1991). For instance, Agnew and Loving (1998) found that male college students' expressed attitudes toward and intentions to use condoms were significantly related to two measures of impression management, but that significantly more negative attitudes and intentions could be elicited if anonymity was stressed. Furthermore, when Ong and Weiss (2000) assigned students to one of two levels of privacy (i.e., confidentiality, where respondents provided their names and Social Security numbers but were assured no individual responses would be disclosed by the researchers, and anonymity, where researchers used private identification numbers to keep track of participants and participants were told to avoid providing their names in order to guarantee that no one could learn how particular individuals responded), using corroborative evidence of student cheating, they reported that while 25% of the cheating

students in the confidentiality condition admitted to cheating, 74% admitted to cheating in the anonymity condition. Finally, in a review of the literature in 1985, Nederhof noted that self-administered questionnaires usually produce lower levels of SDR than telephone or face-to-face interviews. However, self-administration of surveys in the presence of a researcher did not lead to lower levels of SDR, most likely because the presence of the researcher influenced test-takers' perceptions of anonymity. Because the current study was conducted online, these findings are of interest, and the cross-mode equivalency between traditional paper-and-pencil and computer-administered questionnaires is addressed in more detail later.

Another technique successfully shown to reduce SDR is to tell respondents that there are measures included in the questionnaire or interview to detect faking, lying, or SDR (Montag & Comrey, 1982). Stress is also known to play a role in SDR, and thus, should be controlled. For instance, emotional arousal (Paulhus & Levitt, 1987), as well as time constraints (Sutherland & Spilka, 1964) have both increased SDR.

The current study employed two techniques in an attempt to manipulate SDR. As mentioned above, anonymous respondents to self-report questionnaires about cheating are more likely to be honest than those who only remain confidential (Ong & Weiss, 2000), and anonymity has resulted in more honest responding in other areas of research (see for example Agnew & Loving, 1998; Durant, Carey, & Schroder, 2002). Therefore, it may also be true that anonymous respondents to happiness questionnaires are more honest than those who only remain confidential. Thus, the first technique employed was to create two levels of privacy. The first level consisted of a standard confidentiality condition in which respondents' questionnaires were identified by having participants provide their student

identification numbers directly on the questionnaire. The second level consisted of a perceived anonymity condition in which respondents were not instructed to put any personally identifiable information on their questionnaires. However, because the questionnaires were in an online format and participants belonged to a research subject pool and received credit for participation, these students were also required to provide their identification numbers. In order to overcome this obstacle to anonymity, upon completion of the questionnaire, participants in the perceived anonymity condition were redirected to a webpage completely separate from the questionnaire. It is here that these participants provided their student identification numbers, which were used only to grant them participation credit. There was no way to link their student identification numbers to their questionnaires. Thus, perceived anonymity was maintained.

Second, I employed three sets of instructions intended to provide a context or baseline for participants to report their own levels of happiness or depression (see Appendix A for the instructions used). The first instructions drew participants' attention to the fact that most respondents to happiness surveys world-wide rate themselves as happy (Myers & Diener, 1995) and that in the United States, 9 out of 10 respondents report being *pretty happy* to *very happy* (Myers, 2000). These instructions were intended to increase exaggerated claims of happiness due to the likelihood that participants would make social comparisons between their actual levels of happiness and the information stating that most people are happy, leading participants to provide socially desirable responses. The second set of instructions focussed participants on the reported levels of depression in North America and in college students in particular. These instructions were intended to provide participants with tacit permission to report honest levels of depression

by indicating that depression is common, and therefore, acceptable. The third set of instructions were neutral in that no emotional information was provided, and thus, participants were not led to answer in any particular way. The instructions were controlled for length.

### **1.13 Computer Testing and SDR**

The current study used an online questionnaire to gather data. Justification for this is required, as there has been a concern since at least the 1960s that computer-based testing may reduce SDR (Evan & Miller, 1969), and organizations, such as the American Psychological Association (as cited in Dwight & Feigelson, 2000) have questioned the equivalency of computer versus traditional paper-and-pencil administrations of noncognitive measures.

Socially desirable responding may be reduced in computer testing formats in a variety of ways (Dwight & Feigelson, 2000). As previously discussed (e.g., Paulhus, 1984), anonymity is one method of reducing SDR and several researchers (e.g., Evan & Miller, 1969; Kosen, Kitchen, Kochen, & Stodolosky, 1970; Lautenschlager & Flaherty, 1990) have argued that respondents to computer-based questionnaires may have a perception of being more anonymous than if they had completed the questionnaire in a more traditional format. However, evidence in support of this claim is mixed. For instance, researchers have found both a reduction in SDR (e.g., Evan & Miller, 1969) and an increase in SDR (e.g., Booth-Kewley, Edwards, & Rosenfeld, 1992) with computer administered self-reports.

Computers may, in a fashion, act as a bogus pipeline (see Nederhof, 1985 for a description of the bogus pipeline), whereby individuals with little computer knowledge or

experience may erroneously believe that computers can identify their exaggerated or untruthful answers, and therefore, there may be less SDR amongst this group (Dwight & Feigelson, 2000). A related concept, the Big Brother Syndrome (Finnegan & Allen, 1994; Rosenfeld & Booth-Kewley, 1996), proposes that SDR may be reduced or increased due to people's mounting fears that computers are used to monitor and control their lives by being able to link personal information with police and/or government records (Rosenfeld & Booth-Kewley, 1996). The authors argue that under computer administration, SDR may decrease if the respondent believes that the requested information is readily verifiable, but increase if the requested information is thought to be nonverifiable. Because the items that comprise SDR scales are likely to be perceived by test-takers as unverifiable under computer administration, SDR is predicted to increase, which contradicts the more widely accepted expectation of a decrease in SDR due to the increased anonymity afforded by computer administrations (Dwight & Feigelson, 2000).

Finally, SDR may be reduced under computer administration because test-takers are usually limited in their ability to preview, skip, change, or review items, thereby preventing them from developing an overly positive or more comprehensive responding strategy (Lautenschlager & Flaherty, 1990). However, this hypothesis has not been well supported (Booth-Kewley et al., 1992)

Cross-mode equivalency testing requires that mean scores on noncognitive measures be similar for test formats (Dwight & Feigelson, 2000). Unfortunately, much of the research prior to Dwight and Feigelson's meta-analysis used small sample sizes, and therefore, the conflicting results could simply be attributed to sampling error (Dwight & Feigelson, 2000). In addition, the authors argue that tests of SDR often used a

unidimensional, rather than a two-dimensional, conceptualization of SDR, and these two problems (i.e., small sample sizes and unidimensional SDR) may have contributed to the conflict, in which researchers found reduced SDR (e.g., Davis & Cowles, 1989; King & Miles, 1995), increased SDR (e.g., Potosky & Bobko, 1997; Whitener & Klein, 1995), as well as equivalency (e.g., Booth-Kewley et al., 1992; Zinnes & Rezmovic, 1977) under computer administration.

Dwight and Feigelson (2000) overcame these problems in two ways. First, they conducted a meta-analysis on articles spanning several decades that compared social desirability scores for different modes of test administration. These included both traditional face-to-face interview and paper-and-pencil formats, along with computer-based administrations. Meta-analysis overcomes the limitation of small sample sizes by providing an overall estimate of effect size through the synthesis of results from many studies. Dwight and Feigelson examined 200 research articles and conducted the meta-analysis on 30 qualifying articles, which generated 77 effect sizes. Second, they grouped study effect sizes according to Paulhus' two-factor model of SDR, impression management and self-deceptive enhancement. The authors argue that grouping may help resolve the conflicting results from previous studies because these results may be partially attributed to differences in which component of SDR each study assessed. For instance, because impression management is likely a more conscious action, it is more likely to be influenced by contextual factors, such as test format, while self-deceptive enhancement is unlikely to be influenced by test format because it is a less conscious activity.

Dwight and Feigelson (2000) found an overall negative effect size for impression management, but argued that it is probably not of any practical significance. In addition,



over time the influence of computer-based testing on impression management diminished to such a degree that the majority of effect sizes in the more recent studies clustered around zero. They further argue that it is possible that as society becomes more computer literate, the effect on impression management scale scores will diminish even further. No significant effect was found for self-deceptive enhancement, which is in line with its underlying conceptualization. Thus, Dwight and Feigelson concluded that SDR does not appear to be significantly influenced by test format, specifically, by computer-based testing. Consequently, the evidence supported cross-mode equivalence of testing format for noncognitive self-reports. Furthermore, because effects were found for impression management but not for self-deceptive enhancement, results also offer additional support for Paulhus' (1984) two-factor model of SDR. Therefore, computer based administration of noncognitive self-report measures is a valid means of testing study participants and was employed in the present study.

#### **1.14 Goals and Hypotheses**

Much of the research on SDR and measures of subjective well-being and happiness has been concerned with establishing whether or not SDR occurs on these self-reports by administering a measure of SDR in conjunction with a measure of subjective well-being or happiness. The current study aimed to manipulate and assess SDR within the context of measuring subjective well-being, including happiness and depression, to determine whether measures of subjective well-being are susceptible to SDR, as are other self-report measures.

Such findings could lead to a renewed focus on measurement validation and a potential reinterpretation of much of the research on happiness and subjective well-being.

Thus, the aims of Positive Psychology may be compromised. For instance, the current understanding and explanations of subjective well-being, including happiness, may be compromised because the validity of the assessment of subjective well-being was compromised. Similarly, research on the promotion and enhancement of subjective well-being may also be compromised.

This study had several hypotheses. First, all measures of subjective well-being would be positively correlated, but not multicollinear. Second, the measures of subjective well-being would be negatively correlated with the depression measure. Third, the BIDR-6 and the MCSDS would be positively correlated, but not multicollinear. Fourth, CFAs would show that SDR is better defined by Paulhus' two-factor model, consisting of impression management and self-deceptive enhancement, than by Crowne and Marlowe's one-factor model, offering more construct validity for the BIDR-6. Fifth, the happiness measures would be positively correlated with the BIDR-6 and MCSDS, offering support for the claim that subjective well-being, and happiness in particular, is susceptible to SDR. However, the depression measure was hypothesized to be negatively correlated with SDR, confirming previous work indicating a negative relation between SDR and depression (e.g., Holden et al., 2000). Sixth, it was hypothesized that SDR would account for moderate portions of the variance in subjective well-being, happiness, and depression measures, demonstrating that these measures are potentially susceptible to SDR. Finally, it was hypothesized that SDR, as well as happiness and depression scores, would vary as a function of both emotional and level of privacy instruction sets. Specifically, those focussed on happiness and in the confidentiality condition were expected to report the highest levels of SDR, subjective well-being, and happiness, and the lowest levels of

depression. Conversely, those focussed on depression and in the anonymity condition were expected to show the lowest levels of SDR, happiness, and subjective well-being, but the highest levels of depression. Furthermore, it was expected that participants in the anonymous condition would show less SDR as a function of instruction set, and thus, their ratings of happiness and depression would be less influenced by SDR than those who were in the standard confidentiality condition.

## **2. Methods**

This study examined the effects that manipulation of SDR has on self-reported measures of subjective well-being, happiness, and depression using an online survey hosted by SurveyMonkey™. An ability to influence participant responses suggests that the measures commonly used in subjective well-being and happiness research may lack the strength of validity commonly ascribed them.

### **2.1 Participants**

Initially, participants consisted of 219 (22.4% males, 77.6% females) undergraduate students at the University of British Columbia, Okanagan (UBCO) who were taking psychology classes for which they could receive credit for having voluntarily participated in research during the January to April 2007 semester. Although the exclusive use of undergraduate students has its limitations, their use for preliminary SDR research mirrors similar efforts by leaders in the field of SDR research (e.g., Crowne & Marlowe, 1960; Paulhus, 1984). A limited age range of 17-30 years was chosen so that participants were the age of majority in British Columbia, or were considered emancipated adults according to the Behavioural Research Ethics Board Guideline #34.1, while avoiding possible confounds stemming from differences in SDR as a function of age (Dijkstra, Smit, & Comijs, 2001). While screening the data, 17 cases were deleted due to nonrandomly missing information caused by a software malfunction on the service provider's end. Although the missing information was confined to only one question, it was the question pertaining to the participants' desires to have their data included in the analyses. Therefore, no missing data substitution methods could be employed and the cases were deleted. In addition, one case was excluded due to the participant's wish not to

have his or her data included in the study. This resulted in a sample of 201 participants (43 [21.4%] males, 158 [78.6%] females), with an average age of just under 21 years ( $M = 20.65$ ,  $SD = 2.72$ ), and an age range from 18-30 years.

## **2.2 Materials**

Participants completed an online survey comprised of eight self-report questionnaires. However, only seven were used in the current study's analyses, and therefore, only those seven will be described below. Four measures assessed happiness and subjective well-being: 1) the Oxford Happiness Questionnaire-Short Form (OHQ-SF), 2) the Satisfaction With Life Scale (SWLS), 3) the Subjective Happiness Scale (SHS), and 4) the Faces Scale. One measure assessed depression: 5) the Center for Epidemiologic Studies-Depression Scale (CES-D). Two measures assessed SDR: 6) the Balanced Inventory of Desirable Responding-Version 6 (BIDR-6), and 7) the Marlowe-Crowne Social Desirability Scale (MCSDS). Finally, a simple measure assessed basic demographics, including age and gender for the perceived anonymity group and student identification number, age, and gender for the confidentiality group. For an example of the individual questionnaires used in the current study, including identifying reverse-scored items, but not including the experimentally manipulated instructions, see Appendix B. For an example of the online questionnaire participants completed, see Appendix C.

### **2.2.1 OHQ-SF.**

The OHQ-SF measure assesses how participants feel about themselves and is a measure of personal happiness and well-being. It was developed by Hills and Argyle (2002) from the Oxford Happiness Questionnaire (OHQ), which the authors derived from the Oxford Happiness Inventory (OHI, Argyle, Martin, & Crossland, 1989). The OHI

measures well-being using 29 multiple-choice items and previous research shows an association between the OHI and various trait and cognitive variables known to be related to well-being. The OHQ, derived from the OHI, uses 29 items rated on a 6-point scale, half of which are reverse scored. The OHQ and the OHI show very similar results, as demonstrated by their highly related aggregate scores over all items ( $r[163] = .80, p < .001$ ). In addition, the relationships between the OHQ and the personality variables previously associated with well-being are stronger than with the OHI, which suggests the OHQ is actually a better measure of happiness or well-being than the OHI (Hills & Argyle, 2002). In a further attempt to simplify the scale, the OHQ-SF was developed. Ninety percent of participants' scores were correctly classified using only 8 of the 29 items on the OHQ, and the OHQ and the OHQ-SF showed a strong and significant correlation ( $r[168] = .93, p < .001$ ). Thus, the OHQ-SF uses eight items rated on a 6-point scale (e.g., "I feel that life is very rewarding." 1 [*strongly disagree*] to 6 [*strongly agree*]) and is intended for use when timely completion is paramount (Hills & Argyle). In addition, the OHQ-SF shows good internal consistency (e.g.,  $\alpha = .62$ ) as well as short-term test-retest reliability (e.g.,  $r = .69$  after 2 weeks) (Cruise, Lewis, & McGuckin, 2006).

### **2.2.2 SWLS.**

This scale (Diener et al., 1985) assesses the global cognitive or judgmental component of subjective well-being and has been shown to be valid and reliable in a variety of age groups and settings (see Pavot, Diener, Colvin, & Sandvik, 1991). In addition, the SWLS showed good test-retest reliability (an average of .84 for 2 weeks and .84 for 1 month) and convergent validity when compared to other measures of life-

satisfaction and peer-reports of life-satisfaction (e.g., Life Satisfaction Index-A,  $r = .82$ , peer SWLS,  $r = .54$ ) (Pavot et al.). Participants respond to five items using a 7-point scale (e.g., “I am satisfied with my life:” 1 [*strongly disagree*] to 7 [*strongly agree*]).

### **2.2.3 SHS.**

This measure (Lyubomirsky & Lepper, 1999) assesses subjective happiness from a global perspective. Participants respond to four items using a 7-point Likert-type scale (e.g., “Compared to most of my peers, I consider myself:” 1 [*less happy*] to 7 [*more happy*]). The measure shows high internal consistency (e.g., Cronbach’s alphas ranging from .79 to .94), good to excellent test-retest reliability (e.g., after 1 month,  $r = .90$ ), and moderate to high correlations with similar constructs (e.g., Life Orientation Test  $r = .60$ ) and other measures of happiness (e.g., SWLS  $r = .72$ ) respectively, suggesting good construct validity (Lyubomirsky & Lepper, 1999). In addition, it is a reliable ( $\alpha = .85$ ) measure of happiness (Tkach & Lyubomirsky, 2006), and shows both convergent and discriminant validity (Lyubomirsky & Lepper, 1999).

### **2.2.4 Faces Scale.**

This scale is an adaptation by Holder and Coleman (2008) of a measure reported by Andrews and Withey (1976). It is a single-item measure that assesses self-perception of overall, or enduring, happiness using a Likert-type scale with seven simple drawings of faces. The mouths of the faces vary from very downturned (anchored with the words *very unhappy*) to very upturned (anchored with *very happy*), and participants are required to fill in a circle below the face that best represents how they feel most of the time. Other single-item measures of happiness have proven to be both reliable and valid (e.g., Abdel-

Khalek, 2006). The Faces Scale has been documented as a valid and sensitive self-rating measure of happiness (Holder & Coleman, 2008).

### **2.2.5 CES-D.**

This scale (Radloff, 1977) measures depressive symptomatology in the past week using 20 items on a 4-point scale (e.g., “You felt fearful:” 1 [*rarely or none of the time*] to 4 [*most or all of the time*]). It is one of the most widely used screening tests for depression in the general population, has been validated in a wide variety of populations, and shows good test-retest reliability (e.g.,  $r = .67$  at 4 weeks and  $.54$  at 6 months) (see for example Ensel, 1986; Radloff, 1977, 1991; Sheehan, Fifiield, Reisin, & Tennen, 1995).

### **2.2.6 BIDR-6.**

The BIDR-6 (Paulhus, 1991) measures SDR assuming a two-factor model (i.e., impression management and self-deceptive enhancement) using two 20-item measures on a 7-point Likert-type scale (e.g., “I always know why I like things:” 1 [*not true*] to 7 [*very true*]). Each 20-item scale has 10 negatively keyed items that are reverse-scored before calculating an overall score. Paulhus provides two scoring schemas. One uses a continuous scale, whereby the overall score is a sum of the items rated from 1 to 7, and the other is dichotomous. For dichotomous scoring, each item on the scale which receives a score of 6 or 7 from a respondent is assigned a new score of 1 and all others are given 0. The overall score is the sum of the items. The current study employed the dichotomous scoring scheme, as it is the most widely used. As previously discussed, the BIDR-6 has been shown to have good reliability and validity in several studies (Paulhus, 1984, 1991, 2002). For instance, Paulhus (as cited in Paulhus, 1991) found that over a 5-week period the impression management and self-deceptive enhancement subscales had test-retest



correlations of .65 and .69 respectively. In addition, the BIDR showed concurrent validity with the MCSDS ( $r = .71$ ), suggesting it is also a valid measure of SDR (Paulhus as cited in Paulhus, 1991). Moreover, the BIDR-6 is one of the most widely used SDR measures (Beretvas et al., 2002).

### **2.2.7 MCSDS.**

The MCSDS (Crowne & Marlowe, 1960) measures SDR using 33 true-false items (e.g., “I have never intensely disliked anyone:” *True* or *False*). Eighteen items are keyed *true* and 15 items are keyed *false*. Respondents who answer true to the true-keyed items have a stronger tendency to respond in a socially desirable manner than those who answer false to the same items. Conversely, those who answer false to the false-keyed items also reflect SDR. The MCSDS is the most enduring and widely used measure of SDR (Barger, 2002) and has shown high internal consistency (Kuder-Richardson formula 20  $r = .88$ ) and test-retest reliability ( $r = .89$  after 1 month) (Crowne & Marlowe, 1960).

## **2.3 Procedures**

Participants were recruited using an electronic volunteer participant pool in use at UBCO. An outline of the proposed research (see Appendix D) was posted on the research participant pool website, Sona™. The outline included a brief description of the research, including a description of the purpose, the length of the experiment, the number of credits, the names of the researchers, and what a participant would be required to do as part of the experiment. The criteria for exclusion based on age and English proficiency were included in the guidelines posted to the participant pool website so that students could exclude themselves. Undergraduate students had the options to choose to participate in 1 of 6 versions of the study for one extra credit, as approved by the UBCO Research Ethics

Board, or if students chose not to participate, they could complete an extra assignment for one additional credit.

Students who chose to participate in the present study were instructed to click on the web link associated with 1 of 6 separately presented studies (i.e., Measuring Happiness and Other Emotions in a University Population [A-E]). Unfortunately, this method proved problematic for the random assignment of participants to questionnaire versions, but was nonetheless the best method available. Several factors contributed to my inability to randomly assign participants to questionnaires, and in the end, only a quasi-random assignment was achieved. True random assignment was not possible because both the participant pool website and the survey website, at the time of the study, lacked the ability to randomly assign participants to questionnaires. In the case of Sona™, participants chose from a list of many studies and researchers. If several versions of a study were available from the same researchers, all were visible and accessible within the context of the web-posting for the overall study. Thus, at this stage there was no procedure or technology in place to facilitate random assignment. In the case of SurveyMonkey™, the website lacked the capacity to randomly present participants with one of several versions of a questionnaire.

Participants were directed to choose 1 of 6 web links to a questionnaire by limiting the numbers of open slots available for each questionnaire to five. As the slots were filled on one questionnaire, that questionnaire's web link was no longer visible as a choice; thus, participants were left with only those questionnaires in need of respondents to choose from. The researcher monitored available slots daily and made new spaces available as required.

After choosing a questionnaire, the instructions on the first page of the online questionnaire again informed participants of the nature of the research and introduced the researchers. Participants were then reminded of their ineligibility if they were under 17 or over 30 years of age and/or if they were not proficient with English. Participants were also reminded of the voluntary nature of their participation and that they could choose to stop at any time with no penalty. Because of the online nature of the survey, signed consent forms were not obtained. Instead, participants were informed that continuing with the survey was an indication of consent and that closing the web browser window containing the survey was an indication of refusal (see Appendix C). Participants completed the online questionnaires at their convenience. Thus, there were no restrictions on location (e.g., lab vs. home), day, time of day, time needed to complete the questionnaire, or distractions (e.g., solitary vs. surrounded by friends).

Because the current study was a 3 (emotional instructions: happy, sad, neutral) X 2 (privacy instructions: anonymity vs. confidentiality) factorial design, after consent was given, participants were shown 1 of 6 sets of standardized instructions. In the first set of instructions, participants were made aware of the high levels of happiness and well-being reported locally, nationally, and internationally over the past many years. In addition, participants were informed that there was no way to link their answers to their identities, and therefore, their answers were anonymous (see Appendix A for all the instructions used). Thus, these participants were primed to think that high levels of happiness or well-being are the norm throughout the world while simultaneously being primed to think about the anonymity of their responses before completing the questionnaire. In the second set of instructions, participants were made aware of the apparent discrepancy between

reported happiness ratings and the reported high levels of depression in the general population, as well as in college/university students. In addition, the participants were informed of the anonymity of their survey responses. Thus, these participants were primed to think that relatively high levels of sadness or depression are the norm while simultaneously being primed to think about the anonymity of their responses before completing the questionnaire. In the third set of instructions, controlled for length of delivery but containing no emotional primers (i.e., the neutral condition), participants were simply instructed to complete the questionnaire and informed of the anonymity of their responses.

The other three sets of instructions consisted of the same priming for emotion (i.e., happiness/depression/neutrality) but instead of being informed of the anonymity of their responses, participants were informed that their responses were confidential. This was accomplished by informing participants that although their individual answers would never be reported in any presentations or publications related to the study, their answers could be traced back to them by the researchers through their student identification numbers, which participants in the confidentiality condition were obligated to include on their questionnaires. It is important to note that due to the online nature of the survey and consent, no names were ever collected and that all student identification numbers were deleted from the data before analyses were conducted. However, a master raw data set containing both the provided student identification numbers and their associated questionnaires is being kept in a secure file separate from the data files used for analyses. In this way approximately half of the surveys may be linked to individual student identification numbers. However, only the Principal Investigator (Dr. Mark Holder) and

Co-investigator (Robert Callaway) have access to this master data set and, as previously stated, no identifying information will be included in any dissemination of research results. Importantly, combining the various questionnaires (e.g., SHS, OHQ-SF) into a single survey greatly increased the overall length. Therefore, in order to ensure the emotional and privacy priming instructions remained salient, additional reminders were included before the same specific questionnaires in each version of the study (see Appendix A).

Upon completion of the questionnaire, participants were presented with information about mental health services available for those who felt they might have experienced problems because of their participation in the study (see Appendix A or Appendix C). Furthermore, participants were informed that a summary of the results would be posted on Dr. Holder's office door (Arts 320) and that they would also be presented on campus in an advertised public presentation. Finally, the participants were thanked for their participation and instructed to click on the *done* button, whereupon participants were redirected to the UBCO homepage.

## **2.4 Data Analyses**

For the analyses of variance (ANOVAs), ratings of participants' happiness (i.e., participants' self-ratings of happiness using the Faces Scale, SHS, SWLS, and OHQ-SF), depression (i.e., participants' self-ratings of depression using the CES-D), and SDR (i.e., participants' self-ratings of SDR using the BIDR-6 and MCSDS) were used as dependent variables. Gender of the participants was used as the independent variable.

For multiple regression analyses, ratings of participants' happiness (i.e., participants' self-ratings of happiness using the Faces Scale, the SHS, the SWLS, and the

OHQ-SF) and depression (i.e., participants' self-ratings of depression using the CES-D) were used as criterion variables. Social desirability measures (i.e., the BIDR-6 and the MCSDS) were used as predictor measures. For the multivariate analyses of variance (MANOVAs), the seven dependent variables delineated above for the ANOVAs were used as criteria, and instruction sets (i.e., emotional [happy, sad, neutral] and privacy [anonymity vs. confidentiality] instructions) were used as predictors.

Data analyses were conducted in several stages. Because happiness and depression ratings are not normally distributed in the population (i.e., most people throughout the world rate themselves as happy or very happy and only about 10% of the population is depressed within any given year) and the current study was concerned with increasing or decreasing participants' happiness, depression, and social desirability scores, all analyses were conducted on untransformed variables, despite potential violations of the assumptions associated with the appropriate statistical analyses. Scores were not forced into more normal distributions in order to conduct the analyses because the variables of interest are not normally distributed in the general population. In addition, because the present study was concerned with experimentally increasing or decreasing participants' happiness or depression scores, outliers (i.e., those who scored abnormally high or low on measures of happiness or depression) were also included because outliers are of particular interest in this study. Furthermore, imperative to Paulhus' (2002) definition of SDR is the notion of *overly* high scores on his scale. Thus, controlling for outliers made no conceptual sense here either. This approach to the data helped to maintain the original metric of the scales and facilitated the interpretation of the results. Pearson Product moment correlations and descriptive statistics provided an overall perspective of the data.

In addition, reliability analyses were performed on the scales of interest (see Appendix E, Tables 10-16). SPSS version 16.0.1 (SPSS, 2007) was used for these analyses.

Following the initial analyses, CFAs were conducted on the BIDR-6 and the MCSDS in order to determine whether the data fit the models proposed by Paulhus (1984, 1991) and Crowne and Marlowe (1960, 1964) respectively. CFA tests the hypothesis that a relationship exists between observed variables or indicators and their underlying latent constructs by using structural equation modeling to determine how well the data fit a proposed model (Tabachnick & Fidell, 2007). Thus, CFAs are also known as measurement models, and the fit of a data set to a proposed model is determined by examining the fit statistics produced by a CFA. Because each fit statistic describes different aspects of the model, and some fit indices may be unreliable depending on the nature of the data set, it is highly recommended that researchers consult multiple indices in order to more accurately understand the data (Tabachnick & Fidell, 2007). For instance, the  $\chi^2$  statistic is often unreliable in large sample sizes because a significant  $\chi^2$  may be due to the size of the sample, and thus, may actually reflect trivial differences (Tabachnick & Fidell, 2007). Therefore, other fit indices were also used.

The software program Mplus version 3.1 (Muthén & Muthén, 1998) was used for the CFAs, as SPSS lacks structural equation modelling ability (SPSS, 2007; Tabachnick & Fidell, 2007). Furthermore, due to the dichotomous nature of the MCSDS and BIDR-6 items, AMOS, SPSS' structural equation modelling add-on program, could not be used, as it lacks the ability to analyze dichotomous or categorical variables for CFAs (Arbuckle, 2007; Tabachnick & Fidell, 2007). Because the items were dichotomous, instead of Maximum Likelihood (ML) estimation, the mean and variance-adjusted weighted least

squares estimator (WLSMV), the default robust estimator for analyzing categorical indicators in Mplus (Muthén & Muthén, 1998), was used. Leite and Beretvas (2005) also recommend the use of the WLSMV estimator over the ML estimator in order to avoid some of the problems associated with past CFA efforts on the MCSDS and BIDR-6. Mplus provides three fit indices when categorical indicators are analyzed: the comparative fit index (CFI), the Tucker-Lewis Index (TLI), and the root mean square error of approximation (RMSEA). CFAs using categorical indicators show adequate fit when  $CFI > .95$ ,  $TLI > .95$ , and  $RMSEA < .06$  (Muthén & Muthén, 1998).

Following the CFAs, using SPSS version 16.0.1 (SPSS, 2007), seven one-way factorial ANOVAs were performed to determine whether there were significant gender differences in scores on the seven measures of interest. After the ANOVAs, standard multiple regression analyses were conducted to determine how well social desirability variables predicted happiness and depression ratings in participants. Following the regression analyses, a MANOVA was performed to determine whether the experimentally manipulated instructions had a significant impact on participants' responses to the happiness, depression, and social desirability measures.

Finally, after all the analyses were performed on the untransformed variables, all variables were assessed for violations of the assumptions underlying the appropriate analyses and the appropriate deletions and/or transformations were executed (e.g., outliers were assessed and either eliminated or truncated and skewness and kurtosis were corrected through transformations). The transformed variables were then subjected to the same analyses as the untransformed variables, except for the CFAs, which were only conducted on the untransformed individual items comprising the respective SDR scales.



The untransformed variable analyses were compared to the analyses on the transformed variables to determine whether the more traditional approach to statistical analyses produced significantly different results than the analyses on the untransformed variables.

There are no adequate statistical formulae available, that I am aware of, that can be used to compare the results described above. For instance, there is no standard way to compare the results of a multiple regression performed using a set of predictors and an untransformed variable as a dependent variable with a second multiple regression performed using the same set of predictors and the same dependent variable, except that the dependent variable has been transformed. However, there are several formulae that are used to compare dependent correlations (e.g., Steiger, 1980; Steiger & Browne, 1984), where the correlations between two separate predictors (or two sets of predictors) and a single dependent variable can be compared to determine which predictor variable (or set of predictors) best predicts scores on the dependent variable.

Because multiple regression is a form of correlation, I attempted to modify this procedure and formula for the current study. In so doing, the bivariate correlations between the untransformed and transformed variables were determined. The results showed that the transformed variables were nearly singular with the untransformed variables (see Table 1). Thus, the results from analyses performed on the transformed variables should be redundant, or nearly so, with the analyses performed on the untransformed variables. Therefore, dependent correlation comparisons were not performed. Another means of comparing the results is by simply looking at a table of the differences in results between the transformed versus untransformed variables. Although this cannot tell us whether the differences are significant, combined with the near

singularity of the two versions of the variables of interest, we can infer that the differences are most likely not significant. Table 2 displays the multiple regression adjusted  $R^2$  and the unique variances attributed to the BIDR-6 and MCSDS for each of the happiness and depression measures, both in their original and in their transformed metrics. Table 3 displays the MANOVA Wilks lambdas, degrees of freedom, multivariate  $F$ s, and probability levels for the untransformed and transformed variables. The two tables show that the differences in results were minimal, and often there were no differences because results were nearly identical between the two methods of analyses. Hence, only the procedures involved with performing the analyses on the untransformed variables are reported here.

## **2.5 Data Cleaning**

Data were collected from 219 participants. Of these, 18 cases were incomplete. In 17 cases, the missing information was confined to a single question, one pertaining to participants' desire to have their results included in the data set. As such, no substitution method could be employed and the 17 cases were deleted. The additional incomplete case was missing data for the CES-D. The value was replaced with the appropriate group mean (i.e., group mean for the sad anonymous group) and the case remained in the data set for all further analyses (e.g., multiple regressions, MANOVAs). Although using the group mean is a relatively conservative approach, it is not as conservative as using the overall mean or as liberal as using a priori knowledge, and is considered a compromise between the two (Tabachnick & Fidell, 2007). Moreover, there was no a priori knowledge to suggest an appropriate value for the missing data. Additionally, a single case was deleted

because the participant did not want his or her data included in the study, leaving a sample of 201.

Because data analyses included procedures for both ungrouped (e.g., standard multiple regression) and grouped (e.g., MANOVA) data, two data sets were constructed and appropriately cleaned, according to Tabachnick and Fidell's (2007) guidelines for each statistical procedure. The cleaning procedures for the analyses are explained separately below. Table 4 lists the variables used in the analyses, including their means and standard deviations. All measures used are composite scores, except for the Faces Scale, which is a single-item measure. For instance, a participant's score on the SHS is the mean of the four items that comprise the scale, while the scores on the OHQ-SF and the SWLS are the sums of the eight and five items, respectively, that comprise them. Likewise, scores on the CES-D, the BIDR-6, and the MCSDS are also all sums of the 20, 40, and 33 items that respectively comprise these scales.

### **2.5.1 ANOVA.**

Although variables were not assessed for general violations of the statistical assumptions underlying the ANOVA tests, and therefore, no transformations were performed and potential outliers remained in the data set, multicollinearity was assessed, as a violation of multicollinearity may lead to statistical instability and greatly weaken the analysis (Tabachnick & Fidell, 2007). Multicollinearity was separately assessed for males and females. Using Tabachnick and Fidell's (2007) recommendations, multicollinearity was determined to be a problem within the male group, but not the female group. According to Aiken and West (1991), if independent variables are not centered, there is a greater likelihood of having multicollinearity problems. In addition, centering variables

increases interpretability of interactions. Because the current study was interested in the measurement of different components of happiness using multiple measurement tools, as well as the possible interaction between instruction sets using the MANOVA test, instead of deleting the collinear variables with the highest variance proportions, the standard procedure for dealing with multicollinear variables (Tabachnick & Fidell, 2007), new centered variables were created. Variables are centered by subtracting the mean score for that variable from each case in the data set. Thus, each variable's mean becomes zero. Each of the seven variables was centered, a mean of zero confirmed for each, and multicollinearity assessed once more. After centering, multicollinearity was no longer a problem.

### **2.5.2 Multiple Regression.**

As with the ANOVAs, although variables were not assessed for general violations of the statistical assumptions underlying the multiple regression tests, and therefore, no transformations were performed and potential outliers remained in the data set, multicollinearity was assessed. However, unlike with the ANOVAs, multicollinearity was assessed for the entire data set, collapsed across all groups (Tabachnick & Fidell, 2007). No multicollinearity was found.

### **2.5.3 MANOVA.**

Similar to the ANOVAs and multiple regressions, no transformations were performed and any potential outliers remained in the data set. However, multicollinearity was assessed separately in each of the six groups produced by the factorial design. Using Tabachnick and Fidell's (2007) recommendations, multicollinearity was determined to be a problem in several groups. The previously described centered variables were substituted

and multicollinearity was assessed once again. After centering, multicollinearity was no longer a problem.

Table 1.

*Bivariate Correlations Between Transformed and Untransformed Variables*

Transformed variables	Untransformed variables				
	Faces Scale	SHS	SWLS	OHQ-SF	CES-D
Faces Scale <sup>a</sup>	-.99***				
SHS <sup>a</sup>		-.99***			
SWLS <sup>a</sup>			-.99***		
OHQ-SF <sup>a</sup>				-.99***	
CES-D <sup>b</sup>					.98***

Note. <sup>a</sup>reflected square root. <sup>b</sup>square root.

\*\*\*  $p < .001$  (one-tailed).

Table 2.

*Comparison of Multiple Regressions Performed on the Original and Transformed  
Happiness and Depression Measures*

Criteria	Metric	Adjusted $R^2$	Unique variance
Faces Scale	original	.052	BIDR-6 = .017
			MCSDS = .009
	transformed <sup>a</sup>	.065	BIDR-6 = .026
			MCSDS = .008
SHS	original	.113	BIDR-6 = .026
			MCSDS = .025
	transformed <sup>a</sup>	.114	BIDR-6 = .030
			MCSDS = .022
OHQ-SF	original	.104	BIDR-6 = .052
			MCSDS = .005
	transformed <sup>a</sup>	.112	BIDR-6 = .059
			MCSDS = .004
SWLS	original	.075	BIDR-6 = .023
			MCSDS = .013
	transformed <sup>a</sup>	.076	BIDR-6 = .025
			MCSDS = .012
CES-D	original	.085	BIDR-6 = .032
			MCSDS = .010
	transformed <sup>b</sup>	.096	BIDR-6 = .035
			MCSDS = .011

*Note.* <sup>a</sup>reflected square root. <sup>b</sup>square root.

Table 3.

*Comparison of MANOVAs Conducted on Original and Transformed Variables*

Instruction set	Original centered variables					Transformed centered variables				
	Wilks lambda	<i>df</i>	Error <i>df</i>	<i>F</i>	<i>p</i>	Wilks lambda	<i>df</i>	Error <i>df</i>	<i>F</i>	<i>p</i>
emotion	.90	14	378	1.49	.11	.90	14	378	1.54	.09
privacy	.95	7	189	1.32	.24	.96	7	189	1.09	.37
emotion by privacy	.93	14	378	.95	.51	.92	14	378	1.13	.33



Table 4.

*Means and Standard Deviations of Variables Included in Analyses*

Variable type	Measure	Number of items	Scale	Possible range	<i>M</i>	<i>SD</i>
Happiness						
	Faces Scale	1	1-7	1-7	5.34	.82
	SHS	4	1-7	1-7	4.86	1.19
	OHQ-SF	6	1-6	8-48	33.55	6.16
	SWLS	5	1-7	5-35	23.99	6.65
Depression						
	CES-D	20	0-3	0-60	18.69	10.21
Social Desirability						
	BIDR-6	40	1-7 <sup>a</sup>	0-40	10.13	4.84
	MCSDS	33	T/F <sup>b</sup>	0-33	13.80	4.90

*Note.* For the happiness variables, higher numbers indicate that the respondent is *more* happy. For the depression variable, higher scores indicate the respondent is *less* happy. For the social desirability variables higher scores indicate greater SDR from respondents.

<sup>a</sup>For dichotomous scoring, responses of 6-7 are assigned a 1 and all others are assigned a 0 before summing the scores. <sup>b</sup>Before summing the scores, 1s are assigned to True/False item responses reflecting social desirability and 0s assigned to all other responses.

### 3. Results

#### 3.1 Descriptive and Correlational Analyses

According to the Faces Scale, overall, participants rated themselves as happy (see Figure 1). Just over 87% of respondents rated themselves in 1 of the top 3 happiness categories, while only 2% rated themselves in the bottom 3 categories on the 7-point scale. Holder and Coleman (2008) reported similar results for both children and adults using this measure.

Table 5 shows the bivariate correlations between the four happiness variables (i.e., Faces Scale, SHS, OHQ-SF, and SWLS), the depression variable (i.e., CES-D), and the two SDR variables (i.e., BIDR-6 and MCSDS). The correlations confirm that the happiness measures are correlated but not multicollinear (i.e.,  $r > .90$ ; Tabachnick & Fidell, 2007). Thus, the contention that happiness is multidimensional and requires multiple measures to adequately capture the construct is supported. In addition, as hypothesized and confirming other studies, the depression scale is negatively correlated with the measures of happiness. Furthermore, the results confirm that the two SDR scales are also positively correlated, but not multicollinear. Finally, the results support the hypothesis that measures of SDR are positively correlated with measures of happiness and negatively correlated with a measure of depression.

#### 3.2 Confirmatory Factor Analyses

CFAs were conducted on both the BIDR-6 and the MCSDS using structural equation modeling to determine whether the current study's data fit the original models proposed by Paulhus (1984) for the BIDR (i.e., the 40-item two-factor model described in the subsection *Measuring SDR: How Many Dimensions* of the Introduction section, as

well as in the *Materials* subsection of the Methods section) and Crowne and Marlowe (1960, 1964) for the MCSDS (i.e., the 33-item one-factor model described in the same sections as delineated above for the BIDR-6) (see Appendix B for the individual items comprising each measure). In addition to the CFAs conducted on the BIDR-6 and the MCSDS, separate CFAs were conducted on the two factors of the BIDR-6 (i.e., impression management and self-deceptive enhancement) in order to determine whether either was truly unidimensional.

### **3.2.1 BIDR-6.**

The results in Table 6 indicate that the data are not an acceptable fit to the model proposed by Paulhus (1984), with two of the three fit indices falling well below acceptable cut-off values. The subsequent CFAs conducted on the two dimensions (i.e., self-deceptive enhancement and impression management) also show that neither factor is unidimensional, although impression management came close to being an acceptable fit. While these results are in opposition to Paulhus' work, they confirm previous work that reported that the BIDR-6 did not conform to two factors and that impression management was multidimensional (Leite & Beretvas, 2005). However, unlike the current study, this previous work found that self-deceptive enhancement was unidimensional. As corroboration for the CFAs, reliability analyses of the subscales of the BIDR-6 also suggest that the BIDR-6 is comprised of more than two dimensions and that the subscales themselves are multidimensional (see Appendix E, Tables 14 and 15).

### **3.2.2 MCSDS.**

The results for the CFA on the MCSDS (see Table 6) indicate that the data are not an acceptable fit to the model, with two of three fit indices falling well below acceptable

cut-off values. In addition, the reliability analyses of the MCSDS (see Appendix E, Table 16), suggest the measure is not unidimensional. Although this is in opposition to Crowne and Marlowe's (1960, 1964) proposed model, researchers have been suggesting multidimensional versions of the MCSDS since at least the 1970s (e.g., Ramanaiah, Schill, & Leung, 1977), and in their review of the literature, Leite and Beretvas (2005) found no strong evidence that the unidimensional model was supported. Thus, the current results confirm previous work showing that the MCSDS is multidimensional.

### **3.3 ANOVAs**

Seven one-way between-subjects ANOVAs were conducted to determine whether males and females differed significantly on their scores on the four happiness, one depression, and two SDR measures. However, these tests were conducted on the centered versions of the variables. These comparisons were conducted to attempt to control for potential distortions in the results of other statistical procedures employed in the current study. For instance, because females typically report being more depressed on average than males (Piccinelli & Wilkinson, 2000) and the current sample was predominantly female, it was imperative to establish whether or not results of multiple regressions and MANOVAs would be unduly influenced by gender differences in responses to the measures.

To reduce the possibility of Type I errors, the Holm-Bonferonni adjustment method was used. When numbers of comparisons become large, the traditional Bonferonni adjustment (i.e.,  $\alpha/\text{number of tests}$ ) may become too conservative (e.g., Holm, 1979; Jaccard & Wan, 1996). In order to overcome this challenge, a modified Bonferonni procedure that maintains the traditional overall Type I error rate of 5% (i.e.,

alpha = .05) has been developed (Holm, 1979). Briefly, the desired tests are run and the obtained significance values are rank-ordered from smallest to largest. Theory may be used to rank-order tied significance values, but is not a necessity. The smallest significance value (i.e., the first value in the rank order of values) is evaluated using the traditional Bonferonni adjustment. If the obtained value is still significant after the adjustment, then one progresses to the next significance value in the rank-ordered list (i.e., the next smallest significance value). This test statistic is evaluated using  $\alpha/(\text{number of tests} - 1)$ . If, after this adjustment, significance is maintained, one proceeds to the next (i.e., 3<sup>rd</sup>) significance value in the list and evaluates it using  $\alpha/(\text{number of tests} - 2)$ . This process continues until nonsignificance is obtained.

Table 7 shows the ANOVA  $F$ , obtained probability levels, and the Holm-Bonferonni adjusted probability levels required for significant gender differences in scores on the seven measures of interest. As can be seen, males and females only differed significantly on one of seven measures used in the current study. Males were slightly more happy than females as assessed using the OHQ-SF. However, three of four happiness measures showed that males and females did not differ significantly in their self-ratings of happiness. In addition, the depression measure showed that males and females did not differ significantly in their self-ratings of depression. Furthermore, there were no significant differences between males and females on either measure of SDR. The results from the ANOVAs suggest that the results from the multiple regressions and MANOVAs are not unduly impacted by gender differences in scores on the measures of interest. Therefore, data for all further analyses were collapsed across gender.

### 3.4 Multiple Regression Analyses

Standard multiple regressions were conducted to investigate the relationship between the four happiness variables, single depression variable, and the two SDR variables. Five standard multiple regressions were conducted, using each of the four happiness and single depression variables (i.e., Faces Scale, SHS, OHQ-SF, SWLS, and CES-D) as criterion variables. For each regression, the predictor variables were the two SDR measures (i.e., BIDR-6 and MCSDS).

To reduce the possibility of Type 1 errors in the omnibus  $F$  tests for the multiple regressions, a traditional Bonferroni adjustment was used, resulting in an alpha of .01. When determining the amount of significant unique variance accounted for by the two SDR measures, the Holm-Bonferroni adjustment was used to reduce Type I errors. In addition, because the distribution of scores on happiness and depression measures are known to be non-Gaussian (i.e., nonnormal), bootstrapping was used to determine the 99% confidence limits of the regression coefficients obtained from the multiple regressions. Bootstrapping is the random resampling (usually with replacement) of a data set multiple times, usually many thousands of times (Henderson, 2005). If a population distribution is unknown or is non-Gaussian, bootstrapping a sample from that population can be used to model the population, and the determination of confidence intervals in non-Gaussian distributed data was one of the first applications of the bootstrap (Henderson, 2005). Mplus 3.0.1 (Muthén & Muthén, 1998) was used to bootstrap the regression coefficients to provide the 99% confidence limits. Table 8 displays the unstandardized regression coefficients ( $\beta$ ), bootstrapped 99% confidence limits, standardized regression

coefficients ( $\beta$ ), obtained probability, Holm-Bonferonni adjusted probability levels required for significance, and squared semipartial correlations ( $sr^2$ ).

#### **3.4.1 Faces Scale.**

For the regression on the Faces Scale,  $R$  was significantly different from zero,  $F(2,198) = 6.50, p < .01$ , with  $R^2$  at .06 and 95% confidence limits from .01 to .13. The adjusted  $R^2$  of .05 indicates that just over 5% of the variance in the Faces Scale was predicted from knowing scores on the two SDR scales. In addition, the BIDR-6 accounted for 1.7% and the MCSDS .9% of the unique variance in the Faces Scale. However, although the bivariate correlation between the BIDR-6 and the Faces Scale was significantly different from zero using a post hoc correlation,  $r = .23, F(2, 198) = 3.62, p < .05$ , the BIDR-6 did not contribute significantly uniquely to the regression. Using the same post hoc correlation method, the bivariate correlation between the MCSDS and the Faces Scale was neither significantly different from zero,  $r = .21, F(2, 198) = 1.91, p > .10$ , nor a significant unique contributor to the regression. Thus, neither SDR scale contributed significantly uniquely to the variance of the Faces Scale. Further confirmation of the lack of significant unique contributions to the Faces Scale comes from the bootstrapped 99% confidence limits of the regression coefficients for the BIDR-6 and the MCSDS (see Table 8). The bootstrapped 99% confidence limits for both measures include zero, indicating that neither contributes significant unique variance to the variance in the Faces Scale. However, the two SDR scales contributed 3.6% in shared variance.

#### **3.4.2 SHS.**

The  $R$  for the regression on the SHS was also significantly different from zero,  $F(2, 198) = 13.76, p < .001$ , with  $R^2$  at .12 and 95% confidence limits from .05 to .20. The

adjusted  $R^2$  value of .11 indicates that just over 11% of the variance in the SHS is accounted for by the linear combination of the two SDR variables. Both SDR variables also made unique contributions to the variance, with the BIDR-6 contributing 2.6% and the MCSDS contributing 2.5%. The 95% confidence limits for the BIDR-6 and MCSDS were .009 to .089 and .008 to .086 respectively. However, both the Holm-Bonferonni adjusted probability levels and the bootstrapped 99% confidence limits indicate that neither the BIDR-6 nor the MCSDS contributed significant unique variance to the SHS because the obtained probability levels fell far above the Holm-Bonferonni cut-offs and the confidence limits include zero. Finally, the two SDR variables in combination contributed another 7.1% in shared variability.

### **3.4.3 OHQ-SF.**

$R$  for the regression on the OHQ-SF was significantly different from zero,  $F(2, 198) = 12.64, p < .001$ , with  $R^2$  at .11 and 95% confidence limits from .04 to .19. The adjusted  $R^2$  value of .10 indicates that just over 10% of the variance in the OHQ-SF was accounted for by the two SDR scales. The BIDR-6 made a unique contribution, and accounted for 5.2% of the variance, while the MCSDS uniquely contributed .5%. However, the Holm-Bonferonni adjusted probability levels and the bootstrapped 99% confidence limits for the regression coefficients confirm that only the BIDR-6, with a 95% confidence limit of .15 to .56, contributed significantly uniquely to the OHQ-SF because only the limits for the MCSDS included zero and the obtained probability level fell far above the Holm-Bonferonni adjusted probability level required for significance. The two independent variables in combination contributed another 5.6% in shared variability.



#### **3.4.4 SWLS.**

The  $R$  for the regression on the SWLS was significantly different from zero,  $F(2, 198) = 9.14, p < .001$ , with  $R^2$  at .085 and 95% confidence limits from .02 to .16. The adjusted  $R^2$  value of .075 indicates that 7.5% of the variance in the SWLS is accounted for by the two SDR variables. The BIDR-6 made a unique contribution, accounting for 2.3% of the variance in the SWLS, while the MCSDS uniquely contributed 1.3%. Again, both the Holm-Bonferonni adjusted probability levels and the bootstrapped 99% confidence limits indicate that neither scale's contribution was significant. However, the two SDR scales in combination contributed another 4.9% in shared variability.

#### **3.4.5 CES-D.**

Finally, the  $R$  for the regression on the CES-D was also significantly different from zero,  $F(2, 198) = 10.26, p < .001$ , with  $R^2$  at .09 and confidence limits from .03 to .17. The adjusted  $R^2$  value of .085 indicates that 8.5% of the variance in the depression scale is accounted for by the linear combination of the two SDR independent variables. The BIDR-6 made a unique contribution (showing a negative relation to the depression scale), accounting for 3.2% of the variance in the measure, while the MCSDS (also showing a negative relation) contributed 1%. Once again, both the Holm-Bonferonni adjusted probability levels and the bootstrapped 99% confidence intervals indicate that neither scale's contribution was significant. However, the two independent variables in combination contributed 5.2% in shared variability.

### **3.5 MANOVA**

A 2 X 3 between-subjects MANOVA was conducted on seven dependent variables: the centered Faces Scale, OHQ-SF, SHS, SWLS, CES-D, and the BIDR-6 and MCSDS.

Independent variables were privacy instructions (perceived anonymity and confidentiality) and emotion instructions (happy, sad, and neutral).

SPSS MANOVA was used for the analysis with the default unique adjustment for nonorthogonality. With the use of Wilks' criterion, the combined dependent variables were not significantly affected by either emotional instructions,  $F(14, 378) = 1.49, p = .11$ , partial  $\eta^2 = .05$ , with 95% confidence limits from .00 to .07 and power = .85, or privacy instructions,  $F(7, 189) = 1.32, p = .24$ , partial  $\eta^2 = .05$ , with 95% confidence limits from .00 to .08 and power = .56. In addition, there was no significant interaction between the variables,  $F(14, 378) = .95, p = .51$ , partial  $\eta^2 = .03$ , with 95% confidence limits from .00 to .04 and power = .61.

ANOVAs and MANOVAs test to determine whether the mean differences among groups on either a single dependent variable or multiple dependent variables, respectively, are likely due to chance, while multiple regressions assess the strength of these differences by determining the amount of variance specific predictors account for in the dependent variable(s) of interest (Tabachnick & Fidell, 2007). Thus, although bootstrapping is not possible on the results from MANOVAs, bootstrapping on the separate multiple regressions representing the MANOVA model can be performed and the results used to infer conclusions applicable to the MANOVA. Table 9 shows the estimate (i.e., regression coefficient) and the 99% bootstrapped confidence limits around the estimate for the four happiness, one depression, and two SDR measures regressed onto the emotional and privacy instructions. The results indicate that neither set of instructions contributed significantly to the variance in any of the measures of interest because all of the confidence limits for the measures included zero. Thus, the bootstrapped 99%

confidence limits corroborate the results from the MANOVA, strongly suggesting that the experimental manipulation had no effect on any of the dependent variables of interest.

Figure 1.

*Participants' Ratings of Happiness Using the Faces Scale*

**Overall, how do you feel most of the time?**

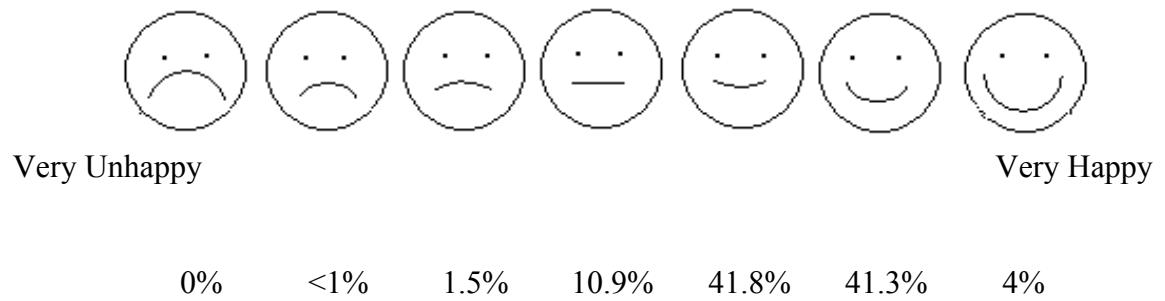


Table 5.

*Pearson Product Moment Correlations Between the Four Measures of Happiness, the Single Measure of Depression, and the Two Measures of SDR*

	Faces Scale	SHS	OHQ-SF	SWLS	CES-D	BIDR6
SHS	.74**					
OHQ-SF	.57**	.68**				
SWLS	.62**	.68**	.70**			
CES-D	-.53**	-.57**	-.63**	-.59**		
BIDR6	.23**	.31**	.33**	.26**	-.29**	
MCSDS	.21**	.31**	.25**	.25**	-.25**	.58**

*Note.* \*\* $p < .01$  (one-tailed).

Table 6.

*CFA Fit Indices for Models Investigated for Responses to the BIDR-6 and the MCSDS*

Form	Number of items	Number of factors	$\chi^2$	<i>df</i>	CFI	TLI	RMSEA
Full BIDR-6	20 SDE, 20 IM	2	114.07**	104	.75	.76	.04
SDE	20	1	99.13**	65	.67	.70	.05
IM	20	1	78.74*	62	.92	.93	.13
MCSDS	33	1	156.25**	115	.87	.87	.04

*Note.* CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root mean square error of approximation; SDE = self-deceptive enhancement; IM = impression management.

\*\* $p < .01$ . \* $p < .05$ .

Table 7.

*Holm-Bonferonni Adjusted Probability Levels Necessary for Significant Gender Differences in Scores on the Four Measures of Happiness, Single Measure of Depression, and Two Measures of SDR*

Measure	$F^a$	Obtained $p$	Holm-Bonferonni $p$
OHQ-SF	8.14	.005	.007
SWLS	4.83	.029	.008
CES-D	2.24	.136	.01
SHS	2.08	.151	.0125
BIDR-6	.84	.361	.0167
Faces Scale	.09	.762	.025
MCSDS	.03	.855	.05

*Note.* <sup>a</sup>  $df = (1, 199)$

Table 8.

*Standard Multiple Regression Results With the Four Happiness and Single Depression Variables Regressed on the BIDR-6 and the MCSDS*

Criteria	Predictors	$\beta$	Bootstrapped 99% CL <sup>a</sup>	$\beta$	Obtained $p$	Holm-Bonferonni $p$	$sr^2$
Faces Scale	BIDR-6 <sup>b</sup>	.03	-.02 - .07	.16	.06	.010	.017
	MCSDS <sup>b</sup>	.02	-.02 - .06	.12	.16	.025	.009
SHS	BIDR-6 <sup>c</sup>	.05	-.01 - .11	.20	.02	.006	.026
	MCSDS <sup>c</sup>	.05	-.01 - .10	.19	.02	.007	.025
OHQ-SF	BIDR-6 <sup>d</sup>	.36	.09 - .62	.28	.001	.005	.052
	MCSDS <sup>d</sup>	.11	-.15 - .37	.09	.30	.050	.005
SWLS	BIDR-6 <sup>e</sup>	.26	-.03 - .53	.19	.03	.008	.023
	MCSDS <sup>e</sup>	.19	-.09 - .47	.14	.09	.013	.013
CES-D	BIDR-6 <sup>f</sup>	-.46	-.90 - .02	-.22	.009	.006	.032
	MCSDS <sup>f</sup>	-.25	-.70 - .18	-.12	.14	.017	.010

*Note.* <sup>a</sup>CL = confidence limits. <sup>b</sup>intercept = 4.79. <sup>c</sup>intercept = 3.72. <sup>d</sup>intercept = 28.46. <sup>e</sup>intercept = 18.77. <sup>f</sup>intercept = 26.88.



Table 9.

*The 99% Confidence Limits for the Estimate of the Multiple Regressions for the Four Happiness, Single Depression, and Two SDR Variables Regressed onto the Emotion and Privacy Instructions*

Criteria	Predictors	Lower .5%	$\beta$	Upper .5%
Faces Scale	emotion	-.23	-.03	.14
	privacy	-.27	.04	.34
SHS	emotion	-.28	-.02	.23
	privacy	-.24	.19	.62
OHQ-SF	emotion	-.92	.41	1.73
	privacy	-.50	1.76	4.05
SWLS	emotion	-1.77	-.31	1.15
	privacy	-1.55	.84	3.31
CES-D	emotion	-2.58	-.46	1.75
	privacy	-5.00	-1.26	2.45
BIDR-6	emotion	-.66	.42	1.47
	privacy	-.90	.84	2.60
MCSDS	emotion	-1.52	.96	2.04
	privacy	-2.18	-.46	1.35

## **4. Discussion**

### **4.1 Summary of the Current Study**

The relation between happiness, depression, and SDR was experimentally investigated. Happiness was assessed with four different measures (i.e., the Faces Scale, SHS, OHQ-SF, and SWLS), depression was assessed with one measure (i.e., the CES-D), and SDR was assessed with two measures (i.e., the BIDR-6 and MCSDS). All measures were self-reports. The experimental manipulation consisted of a 2 X 3 factorial design whereby different groups of participants were given six different sets of instructions that emphasized the level of privacy participants could expect for their responses (i.e., confidentiality vs. anonymity), as well as an emotional comparison context focus of the information (i.e., the prevalence of happiness or depression in the population was emphasized for two conditions while no emotional emphasis was placed in a third, neutral, condition).

CFAs and reliability analyses conducted on the proposed models for both the full MCSDS and BIDR-6, as well as separate CFAs and reliability analyses conducted on the impression management and self-deceptive enhancement subscales of the BIDR-6, strongly suggest that both the MCSDS and BIDR-6 are multidimensional, rather than Crowne and Marlowe's (1964) and Paulhus' (1991) proposed uni- and two-dimensional structures, respectively. Across measures, SDR consistently accounted for a significant proportion of the variance in participants' ratings of happiness and depression. However, only the BIDR-6 proved to be a unique predictor, and then, only for one happiness measure (i.e., OHQ-SF). Finally, the experimental manipulation failed to significantly impact participants' ratings of depression, happiness, or social desirability. Taken

together, the results suggest that SDR's influence on happiness and depression ratings is minimal. Thus, the main contention that the goals of Positive Psychology are compromised by SDR was not confirmed. It appears that our current understanding and explanations of subjective well-being and happiness, although by no means complete, are likely not compromised by invalid assessments of happiness due to social desirability bias. Likewise, research seeking to promote and enhance happiness is likely not compromised. However, as is explained below, there are some caveats to these conclusions.

All of the hypothesized correlations were confirmed. Not surprisingly, the happiness measures were all positively correlated with one another, but not multicollinear. This supports the contention that subjective well-being and happiness are multifaceted and require multiple measures to adequately capture the constructs (Diener et al., 1991; Diener & Seligman, 2004). Furthermore, the negative relations between the happiness and depression measures were also a confirmation of previous work and offer some confirmation for the argument that happiness and depression are not two ends of a well-being continuum (Rashid & Anjum, 2007). If this were true, the correlations between the happiness and depression measures should be greater than those found (see Table 5). The strongest relation reported in the current study was  $-.63$ , which was not sufficient to argue that happiness and depression are two ends of a single spectrum. However, others hold that despite these challenges, happiness and depression are *usefully* understood as occupying two ends of a spectrum (e.g., Russell & Feldman Barrett, 1999; Watson, Wiese, Vaidya, & Tellegen, 1999; Yik, Russell, & Feldman Barrett, 1999). To that end, several measures have been developed that assess both depression and happiness

simultaneously (see for example Andrews & Withey, 1976; Joseph & Lewis, 1998; Joseph, Linley, Harwood, Lewis, & McCollam, 2004), and the current study employed one such measure (i.e., the Faces Scale).

The two SDR measures were positively correlated as hypothesized. However, their correlation of .58 was substantially lower than the .71 reported by Paulhus (1988 as cited in Paulhus, 1991) as evidence of the BIDR's validity. In any case, either correlation confirms that the construct of SDR was conceptualized differently by the measures' originators. This is not surprising, as Paulhus' (1984) intention was to create a new and better measure of SDR that conceptualized SDR as multidimensional, as opposed to the then prevalent unidimensional measures, such as the MCSDS. However, the correlations also suggest that both measures assess a similar underlying construct. Perhaps SDR is multidimensional and each measure only assesses certain aspects of the construct.

The factor structures of the two most commonly used SDR measures (i.e., BIDR-6 and MCSDS) were investigated. CFAs showed that neither measure conformed to its hypothesized factor structure. Moreover, separate CFAs conducted on the impression management and self-deceptive enhancement subscales of the BIDR-6 showed that neither of the subscales was unidimensional, confirming the lack of fit for the full BIDR-6. To test these findings further, reliability analyses were conducted on both SDR measures, as well as the subscales of the BIDR-6 (see Tables 14 and 15). Results strongly suggest that the BIDR-6 is multidimensional and not two-dimensional because so few of the items for the impression management and self-deceptive enhancement subscales had corrected-item total correlations over .30. The same held true for the MCSDS items (see Table 16).

Until Leite and Beretvas (2005), most of the factor analyses performed on the BIDR and MCSDS were not conducted properly, using, among other violations, inappropriate statistical analyses and estimators, too small sample sizes for the number of estimated parameters, and uncorrelated two-factor models for the BIDR instead of the proposed correlated two-factor model (Leite & Beretvas). At such a late date in the evolution of the construct of SDR, this lack of validation of which latent variable(s) underlie the responses to SDR measures was surprising, considering that the most common use of SDR scales is to provide validation for *other* scales of interest (Leite & Beretvas, 2005). The current study employed the recommendations of Leite and Beretvas for the proper implementation of CFAs using dichotomous variable indicators (e.g., the use of the WLSMV estimator as opposed to the ML estimator). Using their recommendations, the current study found similar results, and thus, confirmed that both the MCSDS and the BIDR-6 are multidimensional.

That the MCSDS is multidimensional also confirmed Barger's (2002) conclusions and is not surprising as researchers have been attempting to develop valid two-dimensional models of the MCSDS since at least the 1970s (e.g., Ramanaiah et al., 1977). Unlike Leite and Beretvas (2005), however, the current study found that both of the subscales of the BIDR-6 were multidimensional, while Leite and Beretvas found that only the impression management subscale was multidimensional. Taken together, the evidence suggests that the subscales measure something other than intended or proposed, and therefore, so does the full BIDR-6. The same holds true for the MCSDS. There are important ramifications to these findings. As Leite and Beretvas (2005) point out, because the dimensionality of the BIDR and MCSDS has not been adequately established, the

common belief that a low correlation between scores on the SDR scales and another scale means that this other scale is not contaminated by social desirability is tenuous. In addition, correcting for SDR, when a high correlation between the SDR scales and a focal scale is found, may inadvertently result in misleading conclusions and/or a reduction of power.

The main thrust of the current study was to determine whether the goals of Positive Psychology were compromised by social desirability bias in responses to subjective well-being, happiness, and depression measures. The hypothesis that the goals are compromised was not confirmed. In combination, the two SDR scales accounted for 5% to 11% of the proportion of variance in the four happiness and one depression measure. While these proportions are significant, they are likely not cause for concern. Furthermore, the correlations between the measures of well-being and the SDR scales are similar to, but slightly higher than, those reported in Diener's (1984) review of the literature. He found that correlations rarely exceeded .20, while the current study's correlations ranged from .21 to .33. This is good news for happiness researchers. However, due to the lack of adequate structure validity of the MCSDS and BIDR-6, and the lack of construct validity for SDR in general, this conclusion should be viewed with caution. As stated above, low correlations between the focal scales (i.e., the happiness and depression measures) and the SDR scales do not necessarily mean that the focal scales are devoid of significant social desirability bias (Leite & Beretvas, 2005).

The experimental manipulation failed to influence participants' responses in a significant way. There are three possible explanations for this outcome. First, the salience of the instructions may not have been strong enough to significantly influence

participants' responses. There is no way to know whether participants carefully read the instructions or not, and therefore, it is possible that they may have simply skimmed the information and failed to adequately attend to the information concerning emotion and privacy. However, similar kinds of instructions have been used in the past for both online and traditional administrations of questionnaires which have produced significant differences in results (see for example Agnew & Loving, 1998; Durant et al., 2002; Dwight & Feigelson, 2000; Nederhof, 1985; Ong & Weiss, 2000; Paulhus 1984; Paulhus & Reid, 1991). Moreover, as discussed, cross-mode equivalency of questionnaire administration has been well-established (Dwight & Feigelson, 2000), and therefore, this should not have affected outcomes. Finally, the salience of instructions included in the current study is similar to the kinds of salience one is likely to encounter in the real world when learning new information, and thus, it is unlikely that low salience of the instructions is what failed to produce the hypothesized results.

Second, it may be that the happiness and depression measures are not susceptible to intentional manipulation of SDR using written instructions. This conclusion is consistent with the results of the CFAs, correlations, and multiple regressions, which all point to the negligible influence of SDR on the well-being measures used in the current study. In addition, because the manipulation also failed to produce significant differences in scores on the SDR scales, it suggests that SDR is largely a stable trait, uninfluenced by contextual variations, as argued by Paulhus (2002), among others.

Third, the sample size may have been too small to provide adequate power to detect the small effect sizes obtained. It is widely accepted that a power level of .80 or higher is needed for a test to be statistically powerful enough to detect small effect sizes

(Mazen, Hemmasi, & Lewis, 1987). Only one of the tests met this criterion, with a power of .85. The result strongly suggested that emotional instructions had no impact on participant responses. Although the two other tests failed to meet the .80 criterion, the additional analyses using the bootstrapped 99% confidence limits suggest that these two tests also had no influence on participants' responses. Thus, although the use of a larger sample size would be the best solution, we can infer that the manipulations had no effect on participants.

Taken together, the results suggest that researchers need not be overly concerned about the influence of SDR on the commonly used happiness and depression measures employed in the current study. This is welcome news because it suggests that Positive Psychology is on the right track, focussing on better understanding and explaining subjective well-being, as well as ways to improve people's well-being, and researchers may be able to continue to conduct research without too much concern for SDR contamination invalidating their results. As reported, these findings are in line with previous work on the topic (see for example Diener et al., 1985; Kozma & Stones, 1987, 1988; Larsen et al., 1985). However, given the uncertainty surrounding the construct of SDR, this conclusion contains the caveat that until the construct of SDR is better clarified, and the factor structure well-established, happiness researchers should not completely accept that happiness measures are devoid of significant SDR contamination. Perhaps happiness measures *are* meaningfully contaminated by SDR, but the current operationalization of the construct and extant measures fail to adequately delineate and/or assess the component of SDR that does so.



## 4.2 Strengths of the Current Study

The current study includes several strengths that contribute to the confidence one can place in the results. First, the CFAs used the WLSMV estimator, which is specifically meant to be used when conducting factor analyses on categorical or dichotomous indicator variables (Leite & Beretvas, 2005; Muthén & Muthén, 1998). Using appropriate techniques and estimators for factor analyses on SDR measures which contain dichotomous indicators, such as the BIDR-6 and MCSDS, has been neglected in the past (Leite & Beretvas, 2005). In addition, the results reported here confirm the works of Barger (2002) and Leite and Beretvas (2005), who appear to be among the first and few who have statistically appropriately addressed the concern over the dimensionality of the most commonly used measures of SDR. Thus, the current study's results are strengthened by both the knowledge that appropriate techniques were employed and the similarity of the results to Barger (2002) and Leite and Beretvas (2005).

Second, the results were consistent across measures and the general hypothesis that SDR predicts happiness was supported, despite the small amount of variance in happiness measures SDR accounted for. The current study used four measures of happiness and one measure of depression as criterion variables and two measures of SDR as predictor variables. Despite the severe limitations and conflicting assumptions underlying the SDR measures and the underlying assumptions and limitations of the happiness and depression measures, the two measures of SDR predicted happiness and depression across measures, accounting for similar proportions of variance in each. Had the proportions accounted for been disparate, it would have suggested that at least some of the happiness and depression variables assess something other than happiness and

depression, or at the very least, nonoverlapping subdimensions of happiness and depression. Thus, the results are strengthened by their stability across measures which are purported to assess different components of subjective well-being, happiness, and depression.

Another strength of the study was the use of online surveys. The benefits of online administration should not be underestimated. The savings in time, effort, and money may be substantial, and the ease of implementation worthwhile on its own. Cross-mode equivalency for computer-administered noncognitive tests has been established (Dwight & Feigelson, 2000) and the current study found the expected results in relation to happiness and depression self-ratings, which were also similar to those collected in more traditional paper-and-pencil administrations (see for example Carr, 2004; Diener & Diener, 1996; Seligman, 2002). Thus, computer administration was effective, as well as cheaper and easier because the needs for paper questionnaires, separate test-dates for participants, the presence of a researcher during test administration, and manual data entry or data scanning, among other time, money, and labour intensive challenges, were eliminated. In addition, computer administration allowed for more participants than would most likely have been possible with the traditional paper-and-pencil administration, which increased the sample size, and therefore, strengthened the statistical analyses.

Finally, another strength of the current study was its experimental design. As Lyubomirsky, King, et al. (2005) state, experimental designs allow for stronger conclusions about causes and consequences because variables of interest can be manipulated while potential confounds can be accounted for. Furthermore, to my knowledge this is the first study to attempt to manipulate SDR by varying privacy as well

as targeted emotional information. In the past, studies have attempted to manipulate/control SDR by focusing on privacy (i.e., anonymity and confidentiality) and honest responding. In these cases, along with either being in an anonymous or confidential condition, respondents are also either told to respond as honestly as possible, or to respond in such a way as to portray themselves in a socially desirable manner (commonly called *faking good*) (see for example Barrick & Mount, 1996; Bartlett & Doorley, 1967; Furnham & Craig, 1987; Paulhus & Reid, 1991).

The current study sought to more subtly influence honest responding by indirectly giving one group of participants “permission” to report being sad by informing them that depression is fairly common, and therefore, acceptable. Conversely, another group was made to feel that most everyone is happy, and therefore, pressure to report exaggerated levels of happiness was hoped to be achieved. It may be argued that the focus on depression in one set of instructions exerted pressure to report exaggerated claims of depression, rather than gave participants permission to report true levels of depression. Conversely, the focus on levels of happiness world-wide in another set of instructions could be argued to have given participants “permission” to report being happy, by informing them that elevated levels of happiness are very common and acceptable. However, given the societal pressures to admit being happy (Eysenck, 1990) and the stigma associated with mental illnesses, such as depression (Sirey et al., 2001; Wahl, 1999), it is much more likely that the former, rather than the latter, is true in this case.

#### **4.3 Limitations of the Current Study**

The current study is limited in several ways. First, the sample was restricted to university students enrolled in psychology courses, primarily from first year classes, who

were part of a research subject pool. Recent reviews of the literature on student versus nonstudent populations have been mixed. For instance, Harrison and List (2004) found that both populations behave in qualitatively similar ways, but Alatas, Cameron, Chaudhuri, Erkal, and Gangadharan (2008) found that results are mixed. For instance, despite popular belief to the contrary, university and college students in the United States appear to have *lower* rates of suicide than the general population (Schwartz, 1990). However, despite these challenges, the use of a university subject pool can be defended in several ways. First, important psychological research has been conducted on university students for decades (see for example Crowne & Marlowe, 1960; Paulhus, 1984), and therefore, it is common practice. In addition, research on subjective well-being, including happiness, often uses university students (e.g., Sheldon & Lyubomirsky, 2006), and therefore, testing measures of well-being with this population is important. If need be, research can be expanded to broader populations later. Finally, and perhaps most importantly, the rates of happiness and depression reported here are similar to the rates reported over decades with hundreds of thousands of participants from all across the world (see for example Argyle, 2001; Diener & Diener, 1995, 1996; Diener, Suh, Lucas, et al., 1995; Diener, Suh, Smith, & Shao, 1999).

Second, the study is limited by its lack of ethnic and cultural diversity. Although no demographic information about ethnicity or culture was gathered, visible minorities at UBCO are not representative of the general population. It can be assumed that the majority of respondents were representative of a single culture. This is of some import as there are differences in self-reported happiness levels across cultures (Diener, Suh, Smith, et al., 1995), and this may have implications for the happiness and depression measures

used in the current study, as well as their relation to SDR. Additionally, even if this assumption of homogeneity is not made, no demographic information was gathered, and therefore, there was no way of investigating the role of ethnicity or culture on the variables of interest. Thus, the results from this study cannot be said to be true of other cultures. However, as stated above, the rates of happiness reported here are similar to average rates reported elsewhere using very large and ethnically diverse samples (see for example Argyle, 2001; Diener & Diener, 1995, 1996; Diener, Suh, Lucas, et al., 1995; Diener et al., 1999).

Third, the sample was predominantly female, and there are known gender differences in rates of depression, with females reporting suffering from depression at a greater rate than males (Piccinelli & Wilkinson, 2000; Sigmon et al., 2005). However, the results reported here included a comparison of men and women's self-ratings of happiness and depression, and no significant differences were found. Therefore, although gender differences in depression rates are a general concern and the current study's sample was predominantly female, the current study's results were likely not influenced by this discrepancy.

Fourth, the current study was limited by the fact that personality was not assessed. As discussed in the *SDR and Personality* subsection of the Introduction section, personality and social desirability are related (see for example Li & Bagger, 2006; Paulhus, 1991). Moreover, personality and happiness are related. In fact, personality, which is largely genetically determined, is one of the strongest predictors of happiness and depression (see for example Costa & McCrae, 1980, 1984; DeNeve & Cooper, 1998; Hills & Argyle, 2001; Pavot et al., 1990). Thus, there is likely overlap between SDR and

personality in the amount of variance each accounts for in happiness and depression measures. Therefore, it would have been helpful to determine how much of the variance in happiness and depression was accounted for by SDR over and above the variance accounted for by personality.

Finally, the reliability analyses and CFAs showed that the SDR measures are problematic (see Tables 14-16 and Table 6 respectively). As explained in detail in previous sections, the failure of the data to fit the two models proposed by Paulhus (1984, 1991) and Crowne and Marlowe (1964) greatly weakens the ability to draw firm conclusions about the influence of SDR on happiness and depression measures. Thus, the present study is limited by the SDR measures. Although SDR measures clearly account for a proportion of variance in the happiness and depression measures, the SDR measures may be assessing something other than social desirability, or failing to assess an undetermined component of social desirability. However, whatever SDR scales are measuring, they did contribute to the variance in the happiness and depression measures used in the current study, and therefore, may still be useful predictors.

#### **4.4 Future Directions**

Although I have defended the nature of the current study's sample population, the concerns surrounding potential discrepancies in results due to age, gender, cultural, and student versus nonstudent differences can only be definitively resolved by including the delineated groups. Thus, future studies should focus on recruiting community samples that include more minorities, males, and people of varying ages. These studies should also assess and draw attention to socio-economic status, as cross-cultural research shows that

there are discrepancies in subjective well-being and happiness between those who are poor and those who are wealthy (e.g., Diener, Suh, Smith, et al., 1995).

The original intent of the current study was to determine whether the goals of Positive Psychology were compromised by using two social desirability measures to validate four happiness and one depression measure. It was expected that SDR would account for moderate proportions of variance in the well-being measures, and thus, suggest that the well-being measures are corrupted by SDR, potentially rendering results from previous happiness research at least partially invalid. The unexpected result of this endeavour was to discover that it is more likely that the construct of social desirability and the two most commonly used measures of SDR are themselves in need of validation. Thus, perhaps most importantly, the construct of SDR is in need of further elucidation and the factor structures of both the BIDR-6 and the MCSDS need to be better established.

The resolution of the problems associated with social desirability may mean both the need for a new, more comprehensive definition of the construct, as well as the development of an entirely new measure, which is properly validated using appropriate statistical analyses, such as exploratory factor analyses and CFAs conducted on appropriate sample sizes, using appropriate estimators. Furthermore, currently, there is debate as to whether or not SDR is a component of personality (see for example Tan and Grace, 2008). Therefore, investigators should focus on personality and attempt to develop a measure that accounts for variance in focal scales over and above variance accounted for by personality, in order to be clearly distinct from it.

It is only after SDR and measures of SDR have been properly validated that SDR's true influence on happiness and depression measures can be determined. If there

are significant improvements in the evolution of the construct and measurement of SDR, much of the previous research on relations between SDR and focal scales of interest will need to be replicated. Although any changes in strengths of relationships between an improved SDR measure and focal scales of interest are hypothesized to be relatively minor, replications will be especially important in those areas where levels of SDR may influence policy decisions, which in turn may have practical implications for great numbers of people.

The current study is an important contribution to the paucity of research investigating the factor structures of commonly used measures of SDR. In addition, it is an important contribution to the literature specifically investigating the influence of SDR on measures of subjective well-being because it ties the problems associated with the construct of SDR itself to the challenges of determining whether SDR significantly contaminates measures of happiness and depression. Most of the previous research assumes that the construct of SDR is well established and that the chosen measures of SDR are valid. Researchers have typically not concerned themselves with investigating the factor structures of their SDR measures when establishing the influence of SDR on happiness and depression measures.

The relation between SDR and happiness and depression is commonly thought to be well-established and minimal. The current study suggests that the strength of these relations is not known because we do not have an adequate account of SDR or proper tools to measure it. Thus, the current study provides a strong impetus for renewed definitional and validation efforts.



## 5. References

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## **6. Appendix A**

The six versions of the instructions that participants read before, during, and at the completion of the study. Includes participant consent instructions, as well as reminders used to keep the various conditions (e.g., confidential, sad) salient.

## 6.1. Happy Anonymous Instructions

This study is being conducted by Rob Callaway, a master's student at the University of British Columbia Okanagan (UBCO), under the supervision of Dr. Mark Holder, department of psychology, UBCO. The project is a requirement for the successful completion of a master's degree and has the approval of the Research Ethics Board of UBC, file H06-03648. The study investigates happiness and other emotions in university students. The results of this research may help improve the tools used to measure happiness and well-being. In addition, this research may be used for publication in academic journals. However, results will only be used as part of a larger data set and no individual's identifying information of any sort will be used.

=====New Page

This study will take approximately an hour to complete. Because the questions are in English, you must be proficient with the English language to participate. You must also be between the ages of 19 and 30 to participate.

Your participation in this study is completely voluntary. There is neither penalty for refusal to participate nor reward for participating--beyond being involved in important research. Students who are seeking credits for approved psychology classes will be given 1 credit for participation. If you wish to withdraw from the study, you may do so at any time without penalty by clicking on the "exit this survey" button in the upper right hand corner of the window. Your answers will only be used as part of a larger data set.

If you have any questions or concerns about the way that this experiment is being conducted please contact the Research Ethics Board of UBC at [breb.rise@ors.ubc.ca](mailto:breb.rise@ors.ubc.ca), (604-822-8598), Dr. Mark Holder at [mark.holder@ubc.ca](mailto:mark.holder@ubc.ca), (807-8728) or Rob Callaway at [rob.callaway@ubc.ca](mailto:rob.callaway@ubc.ca).

By continuing with this survey you are consenting to participate in this study; if you do not wish to participate, please close this window.

Thank-you for your participation.

=====New Page

During the survey, no personally identifying information will be gathered from you, and therefore, your answers will be anonymous. That is, we will have no way of linking your survey answers to you personally. In order to receive credit for participation while remaining anonymous, upon completion of this survey you will be directed to a separate survey where you will only submit your student identification number. This information cannot be traced back to your answers on the current survey and will only be used to grant credit to you for your participation. Your answers will remain anonymous.

Research in the area of happiness and well-being shows that world-wide, most people rate themselves as very happy. These ratings have remained high over time and have included

more than 45 nations and more than a million participants. In developed countries, the ratings are even higher. In the United States, 9 out of 10 people rate themselves as “pretty happy” or “very happy”. In three recent studies in Kelowna, over 90% of children, adolescents, and adults rated themselves as happy. We’re interested in how UBCO students rate themselves on some of the same measures of happiness and other emotions that have been used in the research described above.

Please read the instructions carefully.

=====New Page

Upon the completion of this research, the findings will be summarized and posted to Dr. Holder’s office door (Arts 320) making them available specifically to participants. Results will also be communicated at a public presentation at UBCO. The date of the presentation will be posted throughout the campus.

=====New Page

These are contacts provided to assist you if you have concerns about your emotions. They can also help if you are experiencing problems regarding your family or relationships.

UBC-Okanagan: Tracey Sutton, Campus counsellor:  
(250) 807-9270 OR [tracey.sutton@ubc.ca](mailto:tracey.sutton@ubc.ca)

Kelowna Crisis Line:  
(250) 763-9191

Planned Parenthood – Kelowna:  
(250) 979-0251

Outreach Health Services – Kelowna:  
(250) 868-2230

Canadian Mental Health Association:  
(250) 448-7350  
(250) 860-0378  
[www.cmha.ca](http://www.cmha.ca)  
OR [www.cmha-bc.org](http://www.cmha-bc.org)

Interior Health Authority – Kelowna:  
(250) 860-5751 (Main)  
(250) 868-7788 (Mental Health Center)

Kelowna General Hospital:  
(250) 862-4000 (Main)  
(250) 862-4220 (Psychology Dept.)

(250) 862-4326 (Social Work Dept.)  
911 (Emergencies Only)

Vernon and Area Crisis Line:  
(250) 545-2339  
(250) 545-8074 (Teen Crisis Line)  
crisisline@telus.net

Vernon and Area Canadian Mental Health Association:  
(250) 542-3114

Interior Health – Vernon:  
(250) 545-9288 (Main)  
(250) 549-5737 (Mental Health and Addictions)

Vernon Jubilee Hospital:  
(250) 545-2211  
911 (Emergencies Only)

Interior Health – Penticton:  
(250) 770-3434

=====New Page

In order to receive credit for participation while remaining anonymous, upon completion of this survey you will be directed to a separate survey where you will only submit your student identification number. This information cannot be traced back to your answers on the current survey and will only be used to grant credit to you. Your answers will remain anonymous.

Do you wish to have your answers included in this study? Yes No

Don't forget to click the "Done" button at the bottom of this page to submit your survey. You will be directed to a separate page where you will submit your student identification number to grant you credit for participating in this research. Thank you for your time.

=====New Website

If you DID NOT complete the survey and were directed here when you clicked on the "exit this survey" button, simply click on the "exit this survey" button in the upper right hand corner of this window.

If you completed the survey, continue with the instructions below.

In order to receive credit for participation while remaining anonymous, you have been directed to a separate survey. Please provide your student identification number in the box below. This information cannot be traced back to your answers on the previous survey and

will only be used to grant credit to you for participating in this research. Your answers will remain anonymous.

Don't forget to click on the "Done" button to submit your student identification number to receive credit.

Thank-you for your participation.

=====

## **6.2. Happy Confidential Instructions.** (Only those instructions that differ are included)

During the survey, you will be asked to provide your student identification number in order to grant you credit for participating. However, your answers will remain confidential. That is, although there is a way to link your answers on the survey to your student identification number, only the researchers (Rob Callaway and Dr. Mark Holder) will have access to this information. In addition, the list linking participant identification numbers and surveys will be kept in a file separate from the data. Finally, no information that could identify you will be reported or published in any fashion.

Research in the area of happiness and well-being shows that world-wide, on average, most people rate themselves as very happy. These ratings have remained high over time and have included more than 45 nations and more than a million participants. In developed countries, the ratings are even higher. In the United States, 9 out of 10 people rate themselves as “pretty happy” or “very happy”. In three recent studies in Kelowna, over 90% of children, adolescents, and adults rated themselves as happy. We’re interested in how UBCO students rate themselves on some of the same measures of happiness and other emotions that have been used in the research described above.

Please read the instructions carefully.

=====New Page

### **The final page for confidentiality differs slightly from the anonymous condition:**

Do you wish to have your answers included in this study? Yes No

Please provide your student identification number in the box below. This information will only be used to grant you credit for participating.

Don't forget to click the "Done" button at the bottom of this page to submit your survey. Your answers will remain confidential.  
Thank you for your time.

=====



**6.3. Sad Anonymous Instructions.** (Only the instructions about depression and anonymity are included)

During the survey, no personally identifying information will be gathered from you, and therefore, your answers will be anonymous. That is, we will have no way of linking your survey answers to you personally. In order to receive credit for participation while remaining anonymous, upon completion of this survey you will be directed to a separate survey where you will only submit your student identification number. This information cannot be traced back to your answers on the current survey and will only be used to grant credit to you for your participation. Your answers will remain anonymous.

Research shows that although most people rate themselves as very happy, this may not reflect reality. For instance, the World Health Organization states that in any given year almost 10% of men and women world-wide will experience a depressive episode. In the United States, in any given year, 10% of the population will suffer from a depressive illness. University students are particularly prone to depression, showing rates of depression well above the general population. These ratings have remained high over time and have included hundreds of thousands of participants. We're interested in how UBCO students rate themselves on some of the same measures of happiness and other emotions that have been used in the research described above.

Please read the instructions carefully.

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**6.4 Sad Confidentiality Instructions.**

During the survey, you will be asked to provide your student identification number in order to grant you credit for participating. However, your answers will remain confidential. That is, although there is a way to link your answers on the survey to your student identification number, only the researchers (Rob Callaway and Dr. Mark Holder) will have access to this information. In addition, the list linking participant identification numbers and surveys will be kept in a file separate from the data. Finally, no information that could identify you will be reported or published in any fashion.

Research shows that although most people rate themselves as very happy, this may not reflect reality. For instance, the World Health Organization states that in any given year almost 10% of men and women world-wide will experience a depressive episode. In the United States, in any given year, 10% of the population will suffer from a depressive illness. University students are particularly prone to depression, showing rates of depression well above the general population. These ratings have remained high over time and have included hundreds of thousands of participants. We're interested in how UBCO students rate themselves on some of the same measures of happiness and other emotions that have been used in the research described above.

Please read the instructions carefully.

---

### **6.5 Neutral Anonymous Instructions.**

During the survey, no personally identifying information will be gathered from you, and therefore, your answers will be anonymous. That is, we will have no way of linking your survey answers to you personally. In order to receive credit for participation while remaining anonymous, upon completion of this survey you will be directed to a separate survey where you will only submit your student identification number. This information cannot be traced back to your answers on the current survey and will only be used to grant credit to you for your participation. Your answers will remain anonymous.

This survey contains several different questionnaires about well-being that have been combined into one questionnaire for convenience. Most of these questionnaires have been used with hundreds of thousands of participants from all over the world and the ratings reported have remained stable over time. We are interested in how UBCO students rate themselves on these measures of well-being. You are most likely familiar with the questionnaire format because you have probably completed very similar questionnaires in the course of your education.

Please read the instructions carefully.

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### **6.6 Neutral Confidential Instructions.**

During the survey, you will be asked to provide your student identification number in order to grant you credit for participating. However, your answers will remain confidential. That is, although there is a way to link your answers on the survey to your student identification number, only the researchers (Rob Callaway and Dr. Mark Holder) will have access to this information. In addition, the list linking participant identification numbers and surveys will be kept in a file separate from the data. Finally, no information that could identify you will be reported or published in any fashion.

This survey contains several different questionnaires about well-being that have been combined into one questionnaire for convenience. Most of these questionnaires have been used with hundreds of thousands of participants from all over the world and the ratings reported have remained stable over time. We are interested in how UBCO students rate themselves on these measures of well-being. You are most likely familiar with the questionnaire format because you have probably completed very similar questionnaires in the course of your education.

Please read the instructions carefully.

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### **6.7 Anonymity Reminders.**

BIDR-6

You are now instructed to complete several questionnaires. In order to receive credit for participation while remaining anonymous, upon completion of this survey you will be directed to a separate survey where you will only submit your student identification number. This information cannot be traced back to your answers on the current survey and will only be used to grant credit to you for your participation. We will have no way of linking your survey answers to you personally. Therefore, your answers will remain anonymous.

#### **MCSDS**

You have now completed 5 of 8 questionnaires. As previously mentioned, at the end of this survey you will be directed to a separate survey where you will only submit your student identification number. This information cannot be traced back to your answers on the current survey and will only be used to grant credit to you for your participation. Your answers will remain anonymous.

### **6.8 Confidential Reminders.**

#### **BIDR-6**

You are now instructed to complete several questionnaires. At the end of this survey you will be asked to provide your student identification number in order to grant you credit for participating. However, your answers will remain confidential. That is, although there is a way to link your answers on the survey to your student identification number, only the researchers (Rob Callaway and Dr. Mark Holder) will have access to this information. In addition, the list linking participant identification numbers and surveys will be kept in a file separate from the data. Finally, no information that could identify you will be reported or published in any fashion.

#### **MCSDS**

You have now completed 5 of 8 questionnaires. As previously mentioned, at the end of this survey you will be asked to provide your student identification number in order to grant you credit for participating. Only the researchers (Rob Callaway and Dr. Mark Holder) will have access to this information and no information that could identify you will be reported or published in any fashion. Therefore, your answers will remain confidential.

### **6.9 Happy Reminders.**

#### **SHS**

As previously mentioned, research using hundreds of thousands of international participants shows that many people rate themselves as very happy. We are interested in how UBCO students rate themselves on some of the same measures of happiness and other emotions used in previous research.

#### **CES-D**

There are 2 questionnaires about emotions left. As previously mentioned, research in Kelowna shows that over 90% of children, adolescents, and adults rate themselves as

happy. We are interested in how you rate yourself on some of the same measures of happiness and other emotions used in previous research.

#### **6.10 Sad Reminders.**

SHS

As previously mentioned, research using hundreds of thousands of international participants shows that many people rate themselves as sad or depressed. We are interested in how UBCO students rate themselves on some of the same measures of happiness and other emotions used in previous research.

CES-D

There are 2 questionnaires about emotions left. As previously mentioned, research shows that university students are more prone to depression than the general population. We are interested in how you rate yourself on some of the same measures of happiness and other emotions used in previous research.

#### **6.11 Neutral Reminders.**

SHS

As previously mentioned, this survey contains several different questionnaires about well-being, most of which have been used with hundreds of thousands of participants from all over the world. We are interested in how UBCO students rate themselves on some of the same measures of happiness and other emotions used in previous research.

CES-D

There are 2 questionnaires about emotions left. As previously mentioned, this survey contains several different questionnaires about well-being that have been combined into one questionnaire for convenience. Ratings reported have remained stable over time. We are interested in how you rate yourself on some of the same measures of happiness and other emotions used in previous research.

## **7. Appendix B**

Questionnaires used in the study, including the Faces Scale, the Subjective Happiness Scale, the Satisfaction With Life Scale, the Oxford Happiness Questionnaire-Short Form, the Center for Epidemiologic Studies-Depression Scale, the Balanced Inventory of Desirable Responding-Version 6, and the Marlowe Crowne Social Desirability Scale.

Items to be reverse scored are identified.



**OKANAGAN**

THE UNIVERSITY OF BRITISH COLUMBIA OKANAGAN

Irving K. Barber School of Arts and Sciences  
Psychology and Computer Science

## Demographics

How old are you?\_\_\_\_\_

What is your sex? (please choose one) Male                      Female








Questionnaires for participants in the confidentiality condition also include the following question on the last page of the online questionnaire:

Please provide your student identification number in the box below. This information will only be used to grant you credit for participating.

\_\_\_\_\_

## Faces Scale

*Please fill in the circle below the face, that overall, best describes how you feel most of the time.*

						
①	②	③	④	⑤	⑥	⑦
①	①	①	①	①	①	①
Very Unhappy						Very Happy

### BIDR Version 6 - Form 40A

Using the scale below as a guide, write a number beside each statement to indicate how true it is.

1	2	3	4	5	6	7
Not true			Somewhat			Very true

Reverse scored items: 2,4,6,8,10,12,14,16,18,20.

- \_\_\_\_ 1. My first impressions of people usually turn out to be right.
- \_\_\_\_ 2. It would be hard for me to break any of my bad habits.
- \_\_\_\_ 3. I don't care to know what other people really think of me.
- \_\_\_\_ 4. I have not always been honest with myself.
- \_\_\_\_ 5. I always know why I like things.
- \_\_\_\_ 6. When my emotions are aroused, it biases my thinking.
- \_\_\_\_ 7. Once I've made up my mind, other people can seldom change my opinion.
- \_\_\_\_ 8. I am not a safe driver when I exceed the speed limit.
- \_\_\_\_ 9. I am fully in control of my own fate.
- \_\_\_\_ 10. It's hard for me to shut off a disturbing thought.
- \_\_\_\_ 11. I never regret my decisions.
- \_\_\_\_ 12. I sometimes lose out on things because I can't make up my mind soon enough.
- \_\_\_\_ 13. The reason I vote is because my vote can make a difference.
- \_\_\_\_ 14. My parents were not always fair when they punished me.
- \_\_\_\_ 15. I am a completely rational person.
- \_\_\_\_ 16. I rarely appreciate criticism.
- \_\_\_\_ 17. I am very confident of my judgments
- \_\_\_\_ 18. I have sometimes doubted my ability as a lover.
- \_\_\_\_ 19. It's all right with me if some people happen to dislike me.
- \_\_\_\_ 20. I don't always know the reasons why I do the things I do.



Using the scale below as a guide, write a number beside each statement to indicate how true it is.

1	2	3	4	5	6	7
Not true			Somewhat			Very true

Reverse scored items: 21,23,25,27,29,31,33,35,37,39.

- \_\_\_\_ 21. I sometimes tell lies if I have to.
- \_\_\_\_ 22. I never cover up my mistakes.
- \_\_\_\_ 23. There have been occasions when I have taken advantage of someone.
- \_\_\_\_ 24. I never swear.
- \_\_\_\_ 25. I sometimes try to get even rather than forgive and forget.
- \_\_\_\_ 26. I always obey laws, even if I'm unlikely to get caught.
- \_\_\_\_ 27. I have said something bad about a friend behind his/her back.
- \_\_\_\_ 28. When I hear people talking privately, I avoid listening.
- \_\_\_\_ 29. I have received too much change from a salesperson without telling him or her.
- \_\_\_\_ 30. I always declare everything at customs.
- \_\_\_\_ 31. When I was young I sometimes stole things.
- \_\_\_\_ 32. I have never dropped litter on the street.
- \_\_\_\_ 33. I sometimes drive faster than the speed limit.
- \_\_\_\_ 34. I never read sexy books or magazines.
- \_\_\_\_ 35. I have done things that I don't tell other people about.
- \_\_\_\_ 36. I never take things that don't belong to me.
- \_\_\_\_ 37. I have taken sick-leave from work or school even though I wasn't really sick.
- \_\_\_\_ 38. I have never damaged a library book or store merchandise without reporting it.
- \_\_\_\_ 39. I have some pretty awful habits.
- \_\_\_\_ 40. I don't gossip about other people's business.

### Subjective Happiness Scale (SHS)

For each of the following statements and/or questions, please fill in the circle 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						A very
happy person						happy person

2. Compared to 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? (Reverse scored)

①	②	③	④	⑤	⑥	⑦
Not at all						A great deal

## The Short Affect Intensity Scale

Indicate how you typically respond to the following events by using the scale:

1: I never feel like that

2: I almost never feel like that

3: I occasionally feel like that

4: I usually feel like that

5: I almost always feel like that

6: I always feel like that

- |  |     |     |     |     |     |     |
|--|-----|-----|-----|-----|-----|-----|
| 1. When I feel happy, it is a strong type of exuberance  | (1) | (2) | (3) | (4) | (5) | (6) |
| 2. My happy moods are so strong that I feel like I'm in heaven   | (1) | (2) | (3) | (4) | (5) | (6) |
| 3. If I complete a task I thought was impossible, I am ecstatic.   | (1) | (2) | (3) | (4) | (5) | (6) |
| 4. When I'm feeling well, it's easy for me to go from being in a good mood to being really joyful                            | (1) | (2) | (3) | (4) | (5) | (6) |
| 5. When I'm happy, I feel like I'm bursting with joy.  | (1) | (2) | (3) | (4) | (5) | (6) |
| 6. When I'm happy, I feel very energetic.  | (1) | (2) | (3) | (4) | (5) | (6) |
| 7. When things are going good, I feel "on top of the world".   | (1) | (2) | (3) | (4) | (5) | (6) |
| 8. When I'm happy, I bubble over with energy.  | (1) | (2) | (3) | (4) | (5) | (6) |
| 9. Sad movies deeply touch me  | (1) | (2) | (3) | (4) | (5) | (6) |
| 10. When I talk in front of a group for the first time, my voice gets shaky and my heart races.                              | (1) | (2) | (3) | (4) | (5) | (6) |
| 11. When I do something wrong, I have strong feelings of shame and guilt.  | (1) | (2) | (3) | (4) | (5) | (6) |
| 12. When I do feel anxiety, it is normally very strong.  | (1) | (2) | (3) | (4) | (5) | (6) |
| 13. When I feel guilty, this emotion is quite strong.  | (1) | (2) | (3) | (4) | (5) | (6) |
| 14. When I am nervous, I get shaky all over.   | (1) | (2) | (3) | (4) | (5) | (6) |
| 15. When I'm happy, it's a feeling of being untroubled and content rather than being zestful and aroused (reversed).         | (1) | (2) | (3) | (4) | (5) | (6) |
| 16. When I succeed at something, my reaction is calm and contentment (reversed).   | (1) | (2) | (3) | (4) | (5) | (6) |
| 17. When I know I have done something very well, I feel relaxed and content rather than excited and elated (reversed).       | (1) | (2) | (3) | (4) | (5) | (6) |
| 18. When I feel happiness, it is a quiet type of contentment (reversed).   | (1) | (2) | (3) | (4) | (5) | (6) |
| 19. I would characterize my happy moods as closer to contentment than joy (reversed).  | (1) | (2) | (3) | (4) | (5) | (6) |
| 20. When I am happy, the feeling is more like contentment and inner calm than one of exhilaration and excitement (reversed). | (1) | (2) | (3) | (4) | (5) | (6) |

# Oxford Happiness Questionnaire Short Form

1 = strongly disagree    2 = moderately disagree    3 = slightly disagree  
4 = slightly agree    5 = moderately agree    6 = strongly agree

I don't feel particularly pleased with the way I am (-)

①
②
③
④
⑤
⑥  
 Strongly disagree Strongly agree

I feel that life is very rewarding

①
②
③
④
⑤
⑥  
 Strongly disagree Strongly agree

I am well satisfied about everything in my life

①
②
③
④
⑤
⑥  
 Strongly disagree Strongly agree

I don't think I look attractive (-)

①
②
③
④
⑤
⑥  
 Strongly disagree Strongly agree

I find beauty in some things

①
②
③
④
⑤
⑥  
 Strongly disagree Strongly agree

I can fit in everything I want to

①
②
③
④
⑤
⑥  
 Strongly disagree Strongly agree

I feel fully mentally alert

①
②
③
④
⑤
⑥  
 Strongly disagree Strongly agree

I do not have particularly happy memories of the past (-)

①
②
③
④
⑤
⑥  
 Strongly disagree Strongly agree

### **Marlowe-Crowne Social Desirability Scale (MCSDS)**

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is true or false as it pertains to you.

- T    F    1. Before voting I thoroughly investigate the qualifications of all candidates.
- T    F    2. I never hesitate to go out of my way to help someone in trouble
- T    F    3\*. It is sometimes hard for me to go on with my work if I am not encouraged.
- T    F    4. I have never intensely disliked anyone
- T    F    5\*. On occasion I have had doubts about my ability to succeed in life.
- T    F    6\*. I sometimes feel resentful when I don't get my way.
- T    F    7. I am always careful about my manner of dress.
- T    F    8. My table manners at home are as good as when I eat out in a restaurant.
- T    F    9\*. If I could get into a movie without paying and be sure I was not seen, I  
would probably do it.
- T    F    10\*. On a few occasions, I have given up doing something because I thought  
too little of my ability.
- T    F    11\*. I like to gossip at times.
- T    F    12\*. There have been times when I felt like rebelling against people in  
authority even though I knew they were right.
- T    F    13. No matter who I'm talking to, I'm always a good listener.
- T    F    14\*. I can remember "playing sick" to get out of something.
- T    F    15\*. There have been occasions when I took advantage of someone.
- T    F    16. I'm always willing to admit it when I make a mistake.
- T    F    17. I always try to practice what I preach.
- T    F    18. I don't find it particularly difficult to get along with loudmouthed,

obnoxious people.

- T F 19\*. I sometimes try to get even, rather than forgive and forget.
- T F 20. When I don't know something I don't at all mind admitting it.
- T F 21. I am always courteous, even to people who are disagreeable.
- T F 22\*. At times I have really insisted on having things my own way.
- T F 23\*. There have been occasions when I felt like smashing things.
- T F 24. I would never think of letting someone else be punished for my  
wrongdoings.
- T F 25. I never resent being asked to return a favour.
- T F 26. I have never been irked when people expressed ideas very different from  
my own.
- T F 27. I never make a long trip without checking the safety of my car.
- T F 28\*. There have been times when I was quite jealous of the good fortune of  
others.
- T F 29. I have almost never felt the urge to tell someone off.
- T F 30\*. I am sometimes irritated by people who ask favours of me.
- T F 31. I have never felt that I was punished without cause.
- T F 32\*. I sometimes think when people have a misfortune they only got what they  
deserved.
- T F 33. I have never deliberately said something that hurt someone's feelings.

Note: Items marked with an asterisk are keyed negatively.

## Center for Epidemiological Studies Depression Scale (CES-D)

Circle the number of each statement which best describes how often you felt or behaved this way – DURING THE PAST WEEK.

### DURING THE PAST WEEK:

		Rarely or none of the time (Less than 1 day)	Some or a little of the time (1 -2 days)	Occasionally or a moderate amount of the time (3-4 days)	Most or all of the time (5 – 7 days)
1.	I was bothered by things that don't usually bother me	0	1	2	3
2.	I did not feel like eating; my appetite was poor	0	1	2	3
3.	I felt that I could not shake off the blues even with help from my family or friends	0	1	2	3
4.	I felt that I was just as good as other people	0	1	2	3
5.	I had trouble keeping my mind on what I was doing	0	1	2	3
6.	I felt depressed	0	1	2	3
7.	I felt that everything I did was an effort	0	1	2	3
8.	I felt hopeful about the future	0	1	2	3
9.	I thought my life had been a failure	0	1	2	3
10.	I felt fearful	0	1	2	3
11.	My sleep was restless	0	1	2	3
12.	I was happy	0	1	2	3
13.	I talked less than usual	0	1	2	3
14.	I felt lonely	0	1	2	3
15.	People were unfriendly	0	1	2	3
16.	I enjoyed life	0	1	2	3
17.	I had crying spells	0	1	2	3
18.	I felt sad	0	1	2	3
19.	I felt that people disliked me	0	1	2	3
20.	I could not get "going"	0	1	2	3

4, 8, 12, and 16 are reverse scored.

### Satisfaction With Life Scale

Below are five statements with which you may agree or disagree.

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. The 7 – point scale is as follows:

1 = strongly disagree

2 = disagree

3 = slightly disagree

4 = neither agree nor disagree

5 = slightly agree

6 = agree

7 = strongly agree

\_\_\_\_\_ 1. In most ways my life is close to my ideal.    (1) (2) (3) (4) (5) (6) (7)

\_\_\_\_\_ 2. The conditions of my life are excellent.    (1) (2) (3) (4) (5) (6) (7)

\_\_\_\_\_ 3. I am satisfied with my life.    (1) (2) (3) (4) (5) (6) (7)

\_\_\_\_\_ 4. So far I have gotten the important  
things I want in life.    (1) (2) (3) (4) (5) (6) (7)

\_\_\_\_\_ 5. If I could live my life over,  
I would change almost nothing    (1) (2) (3) (4) (5) (6) (7)



## **8. Appendix C**

An example of the online version of the questionnaires that participants completed.

## 1. Measuring Happiness and Other Emotions in a University Population [Exit this survey >>](#)

This study is being conducted by Rob Callaway, a master's student at the University of British Columbia Okanagan (UBCO), under the supervision of Dr. Mark Holder, department of psychology, UBCO. The project is a requirement for the successful completion of a master's degree. The study investigates happiness and other emotions in university students. The results of this research may help improve the tools used to measure happiness and well-being. In addition, this research may be used for publication in academic journals. However, results will only be used as part of a larger data set and no individual's identifying information of any sort will be used.

**[Next >>](#)**

## 1. Measuring Happiness and Other Emotions in a University Population [Exit this survey >>](#)

### 2. Consent

This study will take approximately an hour to complete. Because the questions are in English, you must be proficient with the English language to participate. You must also be between the ages of 17 and 30 to participate.

Your participation in this study is completely voluntary. There is neither penalty for refusal to participate nor reward for participating--beyond being involved in important research. Students who are seeking credits for approved psychology classes will be given 1 credit for participation. If you wish to withdraw from the study, you may do so at any time without penalty by clicking on the "exit this survey" button in the upper right hand corner of the window. Your answers will only be used as part of a larger data set.

If you have any questions or concerns about the way that this experiment is being conducted please contact the Research Subject Information Line in the UBC Office of Research Services at 604-822-8598, Dr. Mark Holder at [mark.holder@ubc.ca](mailto:mark.holder@ubc.ca), (807-8728) or Rob Callaway at [rob.callaway@ubc.ca](mailto:rob.callaway@ubc.ca).

By continuing with this survey you are consenting to participate in this study; if you do not wish to participate, please close this window.

Thank-you for your participation.

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## 1. Measuring Happiness and Other Emotions in a University Population [Exit this survey >>](#)

### 3. Instructions

During the survey, no personally identifying information will be gathered from you, and therefore, your answers will be anonymous. That is, we will have no way of linking your survey answers to you personally. In order to receive credit for participation while remaining anonymous, upon completion of this survey you will be directed to a separate survey where you will only submit your student identification number. This information cannot be traced back to your answers on the current survey and will only be used to grant credit to you for your participation. Your answers will remain anonymous.

Research in the area of happiness and well-being shows that world-wide, most people rate themselves as very happy. These ratings have remained high over time and have included more than 45 nations and more than a million participants. In developed countries, the ratings are even higher. In the United States, 9 out of 10 people rate themselves as "pretty happy" or "very happy". In three recent studies in Kelowna, over 90% of children, adolescents, and adults rated themselves as happy. We're interested in how UBCO students rate themselves on some of the same measures of happiness and other emotions that have been used in the research described above.

Please read the instructions carefully.

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# 1. Measuring Happiness and Other Emotions in a University Population [Exit this survey >>](#)

## 4. Demographics

\* 1. How old are you?

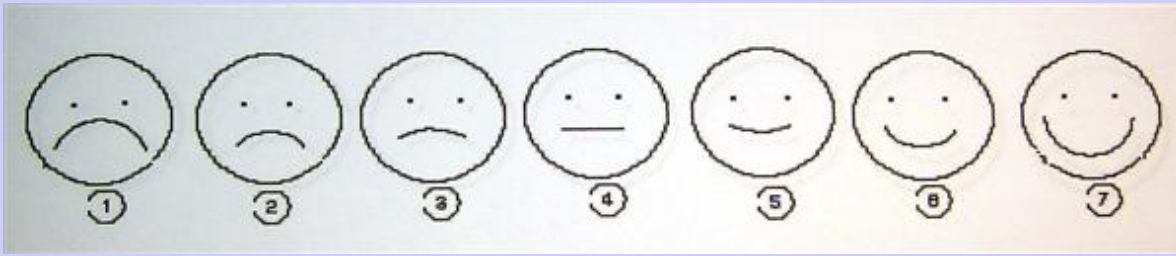
\* 2. What is your sex? (Please choose one)

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## 1. Measuring Happiness and Other Emotions in a University Population [Exit this survey >>](#)

Please click on the circle below the face, that overall, best describes how you feel most of the time.



\*

1. Very  
Unhappy

2.

3.

4.

5.

6.

7. Very Happy



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## 1. Measuring Happiness and Other Emotions in a University Population [Exit this survey >>](#)

You are now instructed to complete several questionnaires. In order to receive credit for participation while remaining anonymous, upon completion of this survey you will be directed to a separate survey where you will only submit your student identification number. This information cannot be traced back to your answers on the current survey and will only be used to grant credit to you for your participation. We will have no way of linking your survey answers to you personally. Therefore, your answers will remain anonymous.

Using the scale below as a guide, choose a number below each statement to indicate how true it is.

1 = not true  
2  
3  
4 = somewhat  
5  
6  
7 = very true

- \* 4. My first impressions of people usually turn out to be right.
- \* 5. It would be hard for me to break any of my bad habits.
- \* 6. I don't care to know what other people really think of me.
- \* 7. I have not always been honest with myself.
- \* 8. I always know why I like things.
- \* 9. When my emotions are aroused, it biases my thinking.
- \* 10. Once I've made up my mind, other people can seldom change my opinion.
- \* 11. I am not a safe driver when I exceed the speed limit.

- \* 12. I am fully in control of my own fate.
- \* 13. It's hard for me to shut off a disturbing thought.
- \* 14. I never regret my decisions.
- \* 15. I sometimes lose out on things because I can't make up my mind soon enough.
- \* 16. The reason I vote is because my vote can make a difference.
- \* 17. My parents were not always fair when they punished me.
- \* 18. I am a completely rational person.
- \* 19. I rarely appreciate criticism.
- \* 20. I am very confident of my judgments
- \* 21. I have sometimes doubted my ability as a lover.
- \* 22. It's all right with me if some people happen to dislike me.
- \* 23. I don't always know the reasons why I do the things I do.
- \* 24. I sometimes tell lies if I have to.



- \* 25. I never cover up my mistakes.
- \* 26. There have been occasions when I have taken advantage of someone.
- \* 27. I never swear.
- \* 28. I sometimes try to get even rather than forgive and forget.
- \* 29. I always obey laws, even if I'm unlikely to get caught.
- \* 30. I have said something bad about a friend behind his/her back.
- \* 31. When I hear people talking privately, I avoid listening.
- \* 32. I have received too much change from a salesperson without telling him or her.
- \* 33. I always declare everything at customs.
- \* 34. When I was young I sometimes stole things.
- \* 35. I have never dropped litter on the street.
- \* 36. I sometimes drive faster than the speed limit.

\* 37. I never read sexy books or magazines.

\* 38. I have done things that I don't tell other people about.

\* 39. I never take things that don't belong to me.

\* 40. I have taken sick-leave from work or school even though I wasn't really sick.

\* 41. I have never damaged a library book or store merchandise without reporting it.

\* 42. I have some pretty awful habits.

\* 43. I don't gossip about other people's business.

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# 1. Measuring Happiness and Other Emotions in a University Population [Exit this survey >>](#)

As previously mentioned, research using hundreds of thousands of international participants shows that many people rate themselves as very happy. We are interested in how UBCO students rate themselves on some of the same measures of happiness and other emotions used in previous research.

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

**\* 44. In general, I consider myself:**

1. Not a very happy person	2.	3.	4.	5.	6.	7. A very happy person
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\* 45. Compared to most of my peers, I consider myself:**

1. Less happy	2.	3.	4.	5.	6.	7. More happy
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\* 46. 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. Not at all	2.	3.	4.	5.	6.	7. A great deal
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**\* 47. 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. Not at all	2.	3.	4.	5.	6.	7. A great deal
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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# 1. Measuring Happiness and Other Emotions in a University Population [Exit this survey >>](#)

\* 48. Indicate how you typically respond to the following events by using the scale:

1: I never feel like that

2: I almost never feel like that

3: I occasionally feel like that

4: I usually feel like that

5: I almost always feel like that

6: I always feel like that

	I never feel like that	almost never	occasionally	usually	almost always	I always feel like that
1. When I feel happy, it is a strong type of exuberance.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. My happy moods are so strong that I feel like I'm in heaven.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. If I complete a task I thought was impossible, I am ecstatic.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. When I'm feeling well, it's easy for me to go from being in a good mood to being really joyful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. When I'm happy, I feel like I'm bursting with joy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. When I'm happy, I feel very energetic.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. When things are going good, I feel "on top of the world".	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. When I'm happy, I bubble over with energy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Sad movies deeply touch me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. When I talk in front of a group for the first time, my voice gets shaky and my heart races.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. When I do something wrong, I have strong feelings of shame and guilt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. When I do feel anxiety, it is normally very strong.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. When I feel guilty, this emotion is quite strong.



14. When I am nervous, I get shaky all over.



15. When I'm happy, it's a feeling of being untroubled and content rather than being zestful and aroused



16. When I succeed at something, my reaction is calm and contentment



17. When I know I have done something very well, I feel relaxed and content rather than excited and elated



18. When I feel happiness, it is a quiet type of contentment



19. I would characterize my happy moods as closer to contentment than joy



20. When I am happy, the feeling is more like contentment and inner calm than one of exhilaration and excitement



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# 1. Measuring Happiness and Other Emotions in a University Population [Exit this survey >>](#)

Indicate how much you agree with the statements by using the scale:

- 1 = strongly disagree
- 2 = moderately disagree
- 3 = slightly disagree
- 4 = slightly agree
- 5 = moderately agree
- 6 = strongly agree

\* 49. I don't feel particularly pleased with the way I am

1 strongly disagree	2	3	4	5	6 strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* 50. I feel that life is very rewarding

1 strongly disagree	2	3	4	5	6 strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* 51. I am well satisfied about everything in my life

1 strongly disagree	2	3	4	5	6 strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* 52. I don't think I look attractive

1 strongly disagree	2	3	4	5	6 strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* 53. I find beauty in some things

1 strongly disagree	2	3	4	5	6 strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* 54. I can fit in everything I want to

1 strongly disagree	2	3	4	5	6 strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* 55. I feel fully mentally alert

1 strongly disagree	2	3	4	5	6 strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* **56. I do not have particularly happy memories of the past**

1 strongly  
disagree

2

3

4

5

6 strongly  
agree



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## 1. Measuring Happiness and Other Emotions in a University Population [Exit this survey >>](#)

You have now completed 5 of 8 questionnaires. As previously mentioned, at the end of this survey you will be directed to a separate survey where you will only submit your student identification number. This information cannot be traced back to your answers on the current survey and will only be used to grant credit to you for your participation. Your answers will remain anonymous.

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is true or false as it pertains to you.

- \* 57. Before voting I thoroughly investigate the qualifications of all candidates.
- \* 58. I never hesitate to go out of my way to help someone in trouble
- \* 59. It is sometimes hard for me to go on with my work if I am not encouraged.
- \* 60. I have never intensely disliked anyone
- \* 61. On occasion I have had doubts about my ability to succeed in life.
- \* 62. I sometimes feel resentful when I don't get my way.
- \* 63. I am always careful about my manner of dress.
- \* 64. My table manners at home are as good as when I eat out in a restaurant.
- \* 65. If I could get into a movie without paying and be sure I was not seen, I would probably do it.
- \* 66. On a few occasions, I have given up doing something because I thought too little of my ability.



- \* 67. I like to gossip at times.
- \* 68. There have been times when I felt like rebelling against people in authority even though I knew they were right.
- \* 69. No matter who I'm talking to, I'm always a good listener
- \* 70. I can remember "playing sick" to get out of something.
- \* 71. There have been occasions when I took advantage of someone.
- \* 72. I'm always willing to admit it when I make a mistake.
- \* 73. I always try to practice what I preach.
- \* 74. I don't find it particularly difficult to get along with loudmouthed, obnoxious people.
- \* 75. I sometimes try to get even, rather than forgive and forget.
- \* 76. When I don't know something I don't at all mind admitting it.
- \* 77. I am always courteous, even to people who are disagreeable.
- \* 78. At times I have really insisted on having things my own way.
- \* 79. There have been occasions when I felt like smashing things.

- \* 80. I would never think of letting someone else be punished for my wrongdoings.
- \* 81. I never resent being asked to return a favour.
- \* 82. I have never been irked when people expressed ideas very different from my own.
- \* 83. I never make a long trip without checking the safety of my car.
- \* 84. There have been times when I was quite jealous of the good fortune of others.
- \* 85. I have almost never felt the urge to tell someone off.
- \* 86. I am sometimes irritated by people who ask favours of me.
- \* 87. I have never felt that I was punished without cause.
- \* 88. I sometimes think when people have a misfortune they only got what they deserved.
- \* 89. I have never deliberately said something that hurt someone's feelings.

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# 1. Measuring Happiness and Other Emotions in a University Population [Exit this survey >>](#)

There are 2 questionnaires about emotions left. As previously mentioned, research in Kelowna shows that over 90% of children, adolescents, and adults rate themselves as happy. We are interested in how you rate yourself on some of the same measures of happiness and other emotions used in previous research.

**\* 90. Choose the circle below the statement which best describes how often you felt or behaved this way – DURING THE PAST WEEK.**

## DURING THE PAST WEEK:

	Rarely or none of the time (less than a day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of the time (3-4 days)	Most or all of the time (5-7 days)
1. I was bothered by things that don't usually bother me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I did not feel like eating; my appetite was poor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I felt that I could not shake off the blues even with help from my family or friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I felt that I was just as good as other people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I had trouble keeping my mind on what I was doing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I felt depressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I felt that everything I did was an effort	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I felt hopeful about the future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I thought my life had been a failure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I felt fearful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. My sleep was restless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I was happy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I talked less than usual	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. I felt lonely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. People were unfriendly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I enjoyed life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. I had crying spells	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. I felt sad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. I felt that people disliked me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. I could not get "going"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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\* 91. Below are five statements with which you may agree or disagree.

Using the 1-7 scale below, indicate your agreement with each item by choosing the appropriate circle. Please be open and honest in your responding. The 7 – point scale is as follows:

1 = strongly disagree

2 = disagree

3 = slightly disagree

4 = neither agree nor disagree

5 = slightly agree

6 = agree

7 = strongly agree

	1. Strongly Disagree	2. Disagree	3. Slightly Disagree	4. Neither Agree Nor Disagree	5. Slightly Agree	6. Agree	7. Strongly Agree
1. In most ways my life is close to my ideal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. The conditions of my life are excellent.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I am satisfied with my life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. So far I have gotten the important things I want in life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. If I could live my life over, I would change almost nothing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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### 13. Research Results

Upon the completion of this research, the findings will be summarized and posted to Dr. Holder's office door (Arts 320) making them available specifically to participants. Results will also be communicated at a public presentation at UBCO. The date of the presentation will be posted throughout the campus.

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## 1. Measuring Happiness and Other Emotions in a University Population [Exit this survey >>](#)

### 14. Contact Information for Mental Health Services

These are contacts provided to assist you if you have concerns about your emotions. They can also help if you are experiencing problems regarding your family or relationships.

UBC-Okanagan: Tracey Sutton, Campus counsellor:  
(250) 807-9270 OR [tracey.sutton@ubc.ca](mailto:tracey.sutton@ubc.ca)

Kelowna Crisis Line:  
(250) 763-9191

Planned Parenthood – Kelowna:  
(250) 979-0251

Outreach Health Services – Kelowna:  
(250) 868-2230

Canadian Mental Health Association:  
(250) 448-7350  
(250) 860-0378  
[www.cmha.ca](http://www.cmha.ca)  
OR [www.cmha-bc.org](http://www.cmha-bc.org)

Interior Health Authority – Kelowna:  
(250) 860-5751 (Main)  
(250) 868-7788 (Mental Health Center)

Kelowna General Hospital:  
(250) 862-4000 (Main)  
(250) 862-4220 (Psychology Dept.)  
(250) 862-4326 (Social Work Dept.)  
911 (Emergencies Only)

Vernon and Area Crisis Line:  
(250) 545-2339  
(250) 545-8074 (Teen Crisis Line)  
[crisisline@telus.net](mailto:crisisline@telus.net)

Vernon and Area Canadian Mental Health Association:  
(250) 542-3114

Interior Health – Vernon:  
(250) 545-9288 (Main)  
(250) 549-5737 (Mental Health and Addictions)

Vernon Jubilee Hospital:  
(250) 545-2211  
911 (Emergencies Only)

Interior Health – Penticton:  
(250) 770-3434

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## 1. Measuring Happiness and Other Emotions in a University Population [Exit this survey >>](#)

In order to receive credit for participation while remaining anonymous, upon completion of this survey you will be directed to a separate survey where you will only submit your student identification number. This information cannot be traced back to your answers on the current survey and will only be used to grant credit to you. Your answers will remain anonymous.

\* 92. Do you wish to have your answers included in this study?

Yes

☐

No

☐

Don't forget to click the "Done" button at the bottom of this page to submit your survey. You will be directed to a separate page where you will submit your student identification number to grant you credit for participating in this research. Thank you for your time.

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[Done >>](#)



## Student ID for Participation Credit

[Exit this survey >>](#)

### 1. Student Identification

If you DID NOT complete the survey and were directed here when you clicked on the "exit this survey" button, simply click on the "exit this survey" button in the upper right hand corner of this window.

If you completed the survey, continue with the instructions below.

- \* 1. In order to receive credit for participation while remaining anonymous, you have been directed to a separate survey. Please provide your student identification number in the box below. This information cannot be traced back to your answers on the previous survey and will only be used to grant credit to you for participating in this research. Your answers will remain anonymous.**

**Don't forget to click on the "Done" button to submit your student identification number to receive credit.**

**Thank-you for your time.**

**Done >>**

## **9. Appendix D**

Initial contact information participants read on Sona.

<b>Study Name</b>	<b>Measuring Happiness and Other Emotions in a University Population (B)</b>
<b>Web Study</b>	This is an online study. To participate, sign up, then go to the website listed below to participate.
<b>Website</b>	You may not view the website until you sign up for this study.
<b>Eligibility Requirements</b>	Because the questions are in English, you must be proficient with the English language to participate. You must also be between the ages of 17 and 30 to participate.
<b>Sign-Up Restrictions</b>	<p>You must NOT have signed up or completed ANY of these studies:</p> <ul style="list-style-type: none"> <li>• <a href="#">Measuring Happiness and Other Emotions in a University Population (A)</a> <b>OK</b></li> <li>• <a href="#">Measuring Happiness and Other Emotions in a University Population (C)</a> <b>OK</b></li> <li>• <a href="#">Measuring Happiness and Other Emotions in a University Population (D)</a> <b>OK</b></li> <li>• <a href="#">Measuring Happiness and Other Emotions in a University Population (E)</a> <b>OK</b></li> <li>• <a href="#">Measuring Happiness and Other Emotions in a University Population (F)</a> <b>OK</b></li> </ul>
<b>Duration</b>	60 minutes
<b>Preparation</b>	The study investigates happiness and other emotions in university students. This study is in the form of an online questionnaire. Questionnaires differ only in their preceding instructions. If you are interested, please click on the web link.
<b>Credits</b>	1 Credits
<b>Researcher</b>	<p>Rob Callaway/Dr. M. Holder  Office: 807-8788  Phone: 808-0262  Email: <a href="mailto:rob.callaway@ubc.ca">rob.callaway@ubc.ca</a></p>

## **10. Appendix E**

Reliability analyses for the Subjective Happiness Scale; the Oxford Happiness Questionnaire-Short Form; the Satisfaction With Life Scale; the Center for Epidemiologic Studies-Depression Scale; the Balanced Inventory of Desirable Responding-Version 6; the Self-Deceptive Enhancement subscale of the BIDR-6; the Impression Management subscale of the BIDR-6; and the Marlowe-Crowe Social Desirability Scale.

The following appendix provides reliability analyses for the Subjective Happiness Scale, the Oxford Happiness Questionnaire-Short Form, the Satisfaction With Life Scale, the Center for Epidemiologic Studies-Depression Scale, the Balanced Inventory of Desirable Responding-Version 6, the Self-Deceptive Enhancement subscale of the BIDR-6, the Impression Management subscale of the BIDR-6, and the Marlowe-Crowe Social Desirability Scale. Cronbach's alphas were calculated for all measures. Values of  $\alpha = .70$  or greater indicate good reliability (Nunally, 1978).

#### Subjective Happiness Scale

Cronbach's alpha was calculated for the Subjective Happiness Scale and found to be  $\alpha = .90$ . Corrected item-total correlations and Cronbach's alpha if item deleted values are presented in Table 10. As the table shows, removing any of the items does not improve the reliability of the measure, and the corrected item-total correlations show that each item contributes to the measure significantly. The results indicate that this scale is a reliable measure of subjective happiness.

Table 10.

*Reliability Analyses for the Subjective Happiness Scale*

Subjective Happiness Scale item	Corrected item-total correlation	Cronbach's alpha if item deleted
In general, I consider myself: <i>not a very happy person</i> through <i>a very happy</i>	.79	.87
Compared to most of my peers, I consider myself: <i>less happy</i> through	.82	.85
Some people are generally very happy. They enjoy life no matter what is going on, getting the most out of everything.	.78	.86
How much does this sentence describe you: <i>Not at all</i> through <i>A great deal</i>		
Some people are generally not very happy. Although they are not depressed, they never seem as happy as they might be. How much does this sentence describe you?: <i>Not at all</i> through <i>A great deal</i>	.75	.88

### Oxford Happiness Questionnaire-Short Form

Cronbach's alpha analyses for the Oxford Happiness Questionnaire-Short Form resulted in a value of  $\alpha = .76$ . The corrected item-total correlations and Cronbach's alpha if item deleted values are presented in Table 11. These analyses indicate that the Oxford Happiness Questionnaire-Short Form was reliably used in the present study. However, removal of the items "I find beauty in some things" (*Strongly disagree* through *Strongly agree*) and "I do not have particularly happy memories of the past" (*Strongly disagree* through *Strongly agree*), would slightly improve the reliability of the measure. This is also indicated by the low (i.e.,  $< .3$ ) corrected item-total correlations for these two items.

Table 11.

*Reliability Analyses for the Oxford Happiness Questionnaire-Short Form*

OHQ-SF item	Corrected item-total correlation	Cronbach's alpha if item deleted
I don't feel particularly pleased with the way I am <sup>a</sup>	.66	.69
I feel that life is very rewarding	.57	.71
I am well satisfied about everything in my life	.58	.71
I don't think I look attractive <sup>a</sup>	.53	.72
I find beauty in some things	.23	.76
I can fit in everything I want to	.36	.75
I feel fully mentally alert	.48	.73
I do not have particularly happy memories of the past <sup>a</sup>	.26	.77

*Note.* <sup>a</sup>This item is reverse scored



### Satisfaction With Life Scale

Cronbach's alpha analyses on the Satisfaction With Life Scale resulted in a value of  $\alpha = .90$ . The corrected item-total correlations and Cronbach's alpha if item deleted values are presented in Table 12. These analyses indicate that the Satisfaction With Life Scale was reliably used in the present study. However, the removal of the item "If I could live my life over, I would change almost nothing" (*Strongly disagree* through *Strongly agree*), would result in a moderate improvement of the reliability of the measure. In addition, each item contributed significantly to the measure.

Table 12.

*Reliability Analyses for the Satisfaction With Life Scale.*

Satisfaction With Life Scale item	Corrected item-total	Cronbach's alpha if
	correlation	item deleted
In most ways my life is close to my ideal.	.80	.87
The conditions of my life are excellent.	.80	.87
I am satisfied with my life.	.85	.86
So far I have gotten the important things I want in life.	.73	.88
If I could live my life over, I would change almost nothing.	.63	.91

### The Center for Epidemiologic Studies-Depression Scale

Cronbach's alpha analyses on the Center for Epidemiologic Studies-Depression Scale resulted in a value of  $\alpha = .90$ . The corrected item-total correlations and Cronbach's alpha if item deleted values are presented in Table 13. These analyses indicate that the Center for Epidemiologic Studies-Depression Scale was reliably used in the present study. In addition, removal of any 1 of the 20 items on the scale would not result in significant improvements. However, one item "I did not feel like eating; my appetite was poor" (*Rarely or none of the time [less than a day] through Most or all of the time [5-7 days]*) has a corrected item-total correlation below .3.

Table 13.

*Reliability Analyses for the Center for Epidemiologic Studies-Depression Scale*

CES-D item	Corrected item-total correlation	Cronbach's alpha if item deleted
I was bothered by things that don't usually bother me	.40	.90
I did not feel like eating; my appetite was poor	.29	.90
I felt that I could not shake off the blues even with help from my family or friends	.67	.89
I felt that I was just as good as other people <sup>a</sup>	.52	.89
I had trouble keeping my mind on what I was doing	.51	.90
I felt depressed	.73	.89
I felt that everything I did was an effort	.39	.90
I felt hopeful about the future <sup>a</sup>	.55	.89
I thought my life had been a failure	.61	.89
I felt fearful	.59	.89
My sleep was restless	.42	.90
I was happy <sup>a</sup>	.59	.89

*Note.* <sup>a</sup>This item is reverse scored

Table 13. Continued.

CES-D item	Corrected item-total correlation	Cronbach's alpha if item deleted
I talked less than usual	.43	.90
I felt lonely	.64	.89
People were unfriendly	.31	.90
I enjoyed life <sup>a</sup>	.55	.89
I had crying spells	.54	.89
I felt sad	.73	.89
I felt that people disliked me	.59	.89
I could not get "going"	.53	.89

*Note.* <sup>a</sup>This item is reverse scored

### The Balanced Inventory of Desirable Responding-Version 6

Cronbach's alpha analyses for the Balanced Inventory of Desirable Responding-Version 6 resulted in a value of  $\alpha = .73$ . The Cronbach's alpha analyses for the self-deceptive enhancement subscale produced a value of  $\alpha = .61$  and the impression management subscale produced a value of  $\alpha = .73$ . The overall analyses show that the BIDR-6 was reliable. However, the Cronbach's alpha for the self-deceptive enhancement subscale indicates that the subscale may not be reliable.

The corrected item-total correlations and Cronbach's alpha if item deleted values for the self-deceptive enhancement subscale are presented in Table 14. These analyses indicate that the self-deceptive enhancement subscale is most likely not unidimensional, as only 4 of 20 items have corrected item-total correlations over .3. The removal of the item "It would be hard for me to break any of my bad habits" (*Not true* through *Very true*) would result in a small improvement of reliability, but it would remain below .7.

The corrected item-total correlations and Cronbach's alpha if item deleted values for the impression management subscale are presented in Table 15. These analyses indicate that the impression management subscale is most likely multidimensional, as only 10 of 20 items have corrected item-total correlations over .3.

The deletion of any of the 20 items would not result in any significant improvement in reliability.

Table 14.

*Reliability Analyses for the Self-Deceptive Enhancement Subscale of the BIDR-6*

Self-Deceptive Enhancement item	Corrected item-total correlation	Cronbach's alpha if item deleted
My first impressions of people usually turn out to be right.	.14	.61
It would be hard for me to break any of my bad habits. <sup>a</sup>	.05	.62
I don't care to know what other people really think of me.	.16	.61
I have not always been honest with myself. <sup>a</sup>	.26	.59
I always know why I like things	.31	.59
When my emotions are aroused, it biases my thinking. <sup>a</sup>	.11	.61
Once I've made up my mind, other people can seldom change my opinion.	.14	.61
I am not a safe driver when I exceed the speed limit. <sup>a</sup>	.12	.61
I am fully in control of my own fate.	.31	.59
It's hard for me to shut off a disturbing thought. <sup>a</sup>	.26	.60

*Note.* <sup>a</sup>This item reverse scored

Table 14. Continued.

Self-Deceptive Enhancement item	Corrected item-total correlation	Cronbach's alpha if item deleted
I never regret my decisions.	.26	.60
I sometimes lose out on things because I can't make up my mind soon enough. <sup>a</sup>	.24	.60
The reason I vote is because my vote can make a difference.	.20	.60
My parents were not always fair when they punished me. <sup>a</sup>	.12	.61
I am a completely rational person.	.28	.59
I rarely appreciate criticism. <sup>a</sup>	.26	.59
I am very confident of my judgments	.34	.58
I have sometimes doubted my ability as a lover. <sup>a</sup>	.20	.60
It's all right with me if some people happen to dislike me.	.31	.59
I don't always know the reasons why I do the things I do. <sup>a</sup>	.18	.60

*Note.* <sup>a</sup>This item reverse scored



Table 15.

*Reliability Analyses for the Impression Management Subscale of the Balanced**Inventory of Desirable Responding-Version 6*

Impression Management item	Corrected item-total	Cronbach's alpha if
	correlation	item deleted
I sometimes tell lies if I have to. <sup>a</sup>	.34	.71
I never cover up my mistakes.	.20	.72
There have been occasions when I have taken advantage of someone. <sup>a</sup>	.30	.72
I never swear.	.25	.72
I sometimes try to get even rather than forgive and forget. <sup>a</sup>	.31	.72
I always obey laws, even if I'm unlikely to get caught.	.47	.70
I have said something bad about a friend behind his/her back. <sup>a</sup>	.28	.72
When I hear people talking privately, I avoid listening.	.23	.72
I have received too much change from a salesperson without telling him or her. <sup>a</sup>	.29	.72
I always declare everything at customs.	.35	.71

Note. <sup>a</sup>This item reverse scored.

Table 15. Continued.

Impression management item	Corrected item-total correlation	Cronbach's alpha if item deleted
When I was young I sometimes stole things. <sup>a</sup>	.34	.71
I have never dropped litter on the street.	.48	.70
I sometimes drive faster than the speed limit. <sup>a</sup>	.05	.73
I never read sexy books or magazines.	.23	.72
I have done things that I don't tell other people about. <sup>a</sup>	.08	.73
I never take things that don't belong to me.	.40	.71
I have taken sick-leave from work or school even though I wasn't really sick. <sup>a</sup>	.18	.73
I have never damaged a library book or store merchandise without reporting it.	.34	.71
I have some pretty awful habits. <sup>a</sup>	.37	.71
I don't gossip about other people's business.	.18	.72

*Note.* <sup>a</sup>This item reverse scored.

### Marlowe-Crowne Social Desirability Scale

Cronbach's alpha analyses for the Marlowe-Crowne Social Desirability Scale resulted in a value of  $\alpha = .74$ . The corrected item-total correlations and Cronbach's alpha if item deleted values are presented in Table 16. These analyses indicate that although the Marlowe-Crowne Social Desirability Scale was reliably used in the present study, it is most likely not unidimensional, as a majority of the items had corrected item-total correlations below .3. In addition, removal of any 1 of the 33 items on the scale would not result in significant improvements.

Table 16.

*Reliability Analyses for the Marlowe-Crowne Social Desirability Scale*

Marlowe-Crowne Social Desirability	Corrected item-total	Cronbach's alpha if
Scale item	correlation	item deleted
Before voting I thoroughly investigate the qualifications of all candidates.	.16	.74
I never hesitate to go out of my way to help someone in trouble	.33	.73
It is sometimes hard for me to go on with my work if I am not encouraged. <sup>a</sup>	.06	.74
I have never intensely disliked anyone	.16	.74
On occasion I have had doubts about my ability to succeed in life. <sup>a</sup>	.24	.73
I sometimes feel resentful when I don't get my way. <sup>a</sup>	.39	.73
I am always careful about my manner of dress.	.09	.74
My table manners at home are as good as when I eat out in a restaurant.	.15	.74

*Note.* <sup>a</sup>Items keyed negatively

Table 16. Continued.

Marlowe-Crowne Social Desirability Scale item	Corrected item-total correlation	Cronbach's alpha if item deleted
If I could get into a movie without paying and be sure I was not seen, I would probably do it. <sup>a</sup>	.09	.74
On a few occasions, I have given up doing something because I thought too little of my ability. <sup>a</sup>	.10	.74
I like to gossip at times. <sup>a</sup>	.23	.73
There have been times when I felt like rebellling against people in authority even though I knew they were right. <sup>a</sup>	.39	.72
No matter who I'm talking to, I'm always a good listener.	.39	.72
I can remember "playing sick" to get out of something. <sup>a</sup>	.20	.74
There have been occasions when I took advantage of someone. <sup>a</sup>	.46	.72
I'm always willing to admit it when I make a mistake.	.21	.74
I always try to practice what I preach.	.29	.73

Note. <sup>a</sup>Items keyed negatively

Table 16. Continued.

Marlowe-Crowne Social Desirability Scale item	Corrected item-total correlation	Cronbach's alpha if item deleted
I don't find it particularly difficult to get along with loudmouthed, obnoxious people.	.08	.74
I sometimes try to get even, rather than forgive and forget. <sup>a</sup>	.42	.72
When I don't know something I don't at all mind admitting it.	.36	.73
I am always courteous, even to people who are disagreeable.	.33	.73
At times I have really insisted on having things my own way. <sup>a</sup>	.24	.73
There have been occasions when I felt like smashing things. <sup>a</sup>	.21	.74
I would never think of letting someone else be punished for my wrongdoings	.31	.73
I never resent being asked to return a favour.	.34	.73

*Note.* <sup>a</sup>Items keyed negatively

Table 16. Continued.

Marlowe-Crowne Social Desirability Scale item	Corrected item-total correlation	Cronbach's alpha if item deleted
I have never been irked when people expressed ideas very different from my own.	.27	.73
I never make a long trip without checking the safety of my car.	.11	.74
There have been times when I was quite jealous of the good fortune of others. <sup>a</sup>	.25	.73
I have almost never felt the urge to tell someone off.	.18	.74
I am sometimes irritated by people who ask favours of me. <sup>a</sup>	.45	.72
I have never felt that I was punished without cause.	.20	.74
I sometimes think when people have a misfortune they only got what they deserved. <sup>a</sup>	.08	.74
I have never deliberately said something that hurt someone's feelings	.35	.73

*Note.* <sup>a</sup>Items keyed negatively

## **11. Appendix F**

### **UBC Okanagan Research Ethics Board Certificate of Approval**





## CERTIFICATE OF APPROVAL - MINIMAL RISK

<b>PRINCIPAL INVESTIGATOR:</b> Mark H. Holder	<b>INSTITUTION / DEPARTMENT:</b> UBC/UBCO IKE Barber School of Arts & Sc/UBCO Admin Unit 4 Arts & Sci	<b>UBC BREB NUMBER:</b> H06-03648
<b>INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT:</b>		
<b>Institution</b>	<b>Site</b>	
UBC Other locations where the research will be conducted: The research will be conducted online, and therefore, participants may be at any of many possible locations while completing the questionnaire.		
<b>CO-INVESTIGATOR(S):</b> Rob Callaway		
<b>SPONSORING AGENCIES:</b> UBC Okanagan - "Correlates of Happiness in Children Aged 9-12 years"		
<b>PROJECT TITLE:</b> Measuring Happiness and Other Emotions in a University Population		

**CERTIFICATE EXPIRY DATE: February 27, 2008**

<b>DOCUMENTS INCLUDED IN THIS APPROVAL:</b>	<b>DATE APPROVED:</b> February 27, 2007	
<b>Document Name</b>	<b>Version</b>	<b>Date</b>
<b>Protocol:</b>		
Measuring Happiness and Other Emotions in a University Population	N/A	January 7, 2007
<b>Questionnaire, Questionnaire Cover Letter, Tests:</b>		
Neutral Confidential Full Questionnaire	N/A	February 15, 2007
Happy Anonymous Full Questionnaire	N/A	February 15, 2007
Sad Anonymous Full Questionnaire	N/A	February 15, 2007
Happy Confidential Full Questionnaire	N/A	February 15, 2007
Neutral Anonymous Full Questionnaire	N/A	February 15, 2007
Sad Confidential Full Questionnaire	N/A	February 15, 2007
Pen and Paper Measuring Happiness Questionnaires	N/A	January 7, 2007
<b>Letter of Initial Contact:</b>		
Initial Contact for Measuring Happiness	N/A	February 15, 2007
<b>Other:</b>		
The following URL is the link to the UBC website where students will read about the proposed research and interested students will choose 1 of 6 questionnaires. The information contained on this webpage has been attached in item 9.7 Letter of initial contact. <a href="https://hsp.psych.ubc.ca/">https://hsp.psych.ubc.ca/</a> The following URLs are links to the 6 online questionnaires as well as the separate webpage where participants in the perceived anonymity condition will provide their student identification numbers in order to receive credit for participating in the study. The questionnaires etc. contained on these pages have been attached in item 9.6 Questionnaire, questionnaire cover letter, tests, interview scripts, etc. Questionnaire 1 <a href="http://www.surveymonkey.com/s.asp?u=588463097430">http://www.surveymonkey.com/s.asp?u=588463097430</a> Questionnaire 2 <a href="http://www.surveymonkey.com/s.asp?u=926343099271">http://www.surveymonkey.com/s.asp?u=926343099271</a> Questionnaire 3 <a href="http://www.surveymonkey.com/s.asp?u=598473099288">http://www.surveymonkey.com/s.asp?u=598473099288</a> Questionnaire 4 <a href="http://www.surveymonkey.com/s.asp?u=511213099290">http://www.surveymonkey.com/s.asp?u=511213099290</a> Questionnaire 5 <a href="http://www.surveymonkey.com/s.asp?u=857173099296">http://www.surveymonkey.com/s.asp?u=857173099296</a> Questionnaire 6 <a href="http://www.surveymonkey.com/s.asp?u=693433099299">http://www.surveymonkey.com/s.asp?u=693433099299</a> Perceived Anonymity Student Identification Number Page <a href="http://www.surveymonkey.com/s.asp?u=516593099140">http://www.surveymonkey.com/s.asp?u=516593099140</a> The following URL is the official website of UBCO. Upon completion of the questionnaire, all participants will automatically be directed to this website. <a href="http://web.ubc.ca/okanagan/welcome.html">http://web.ubc.ca/okanagan/welcome.html</a>		
The application for ethical review and the document(s) listed above have been reviewed and the procedures were found to be acceptable on ethical grounds for research involving human subjects.		

**Approval is issued on behalf of the Behavioural Research Ethics Board  
and signed electronically by one of the following:**

Dr. Peter Suedfeld, Chair  
Dr. Jim Rupert, Associate Chair  
Dr. Arminee Kazanjian, Associate Chair  
Dr. M. Judith Lynam, Associate Chair