SELF-DECEPTION AS A MEDIATOR OF THE RELATIONSHIP BETWEEN DISPOSITIONS AND SUBJECTIVE WELL-BEING

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Summary—Psychological theories of subjective well-being (SWB) have been ambiguous in their explanations of how dispositions influence happiness. This paper suggests that self-deception may serve as one important psychological variable that partly explains the disposition–subjective well-being link. Our findings suggested that self-deception significantly affected subjective well-being. In addition, our results indicated that dispositional tendencies such as affective disposition and locus of control influenced subjective well-being through self-deception. Consequently, individuals who were positively disposed or had high expectations of control tended to use self-deception which in turn increased their SWB. This research provides a preliminary yet provocative look at the explanatory power of thought processes such as self-deception on subjective well-being.

Despite a long tradition of research exploring the sources of individuals' happiness, no one theory of subjective well-being (SWB) has risen above others to dominate this area of study. The main reason for this is incompleteness in the existing subjective well-being theories. Psychological theories of SWB are mainly divided into two broad categories, top–down and bottom–up (Diener, 1984). The top–down approach suggests that individuals are happy because they are predisposed to react to events and circumstances in a positive way, while the bottom–up approach maintains that people are happy because they experience numerous happy moments in their lives. A key distinction between these two approaches revolves around the role of personality. Top–down approaches emphasize the role of personality in interpreting the environment, while bottom–up approaches downplay personality influences. Both these theoretical approaches, however, ignore the cardinal question of *how* personality influences SWB. The top–down theory does not explain how and why predispositional reactions to stimuli influence happiness, while the bottom–up theoretical approach does not explain how different people can experience the same events but have very different interpretations. Consequently, although evidence has been presented to support both hypotheses (Diener & Larsen, 1993), the fact that these theories are ambiguous makes it difficult to interpret the research testing these theories, as well as determine which results are valid and explain why contradictions occur. Accordingly, in order to make these theories more useful, they need to be better clarified and developed.

In as much as these theories are deficient in their explication of the mental processes leading to SWB, one possible way of better constructing these theories is by linking them to individual thinking styles. Thinking styles may explain how individuals select and process information in interpreting life events, and may account for individual differences in these interpretations. The idea of linking certain thinking styles to subjective well-being is not a new one. Evidence has been presented that dysfunctional thought processes, such as perfectionism and overgeneralization may cause unhappiness (Haaga, Dyck & Ernst, 1991). These thought processes are self-detracting and comprise inaccurate cognitions involved in screening, encoding and evaluating information (Keller, 1983), thus negatively biasing attitudes. On the other hand, accumulated evidence in social psychology research suggests that individuals may possess self-enhancing thought processes that, although irrational by nature, have a positive influence on levels of subjective well being (Taylor & Brown, 1988). For example, thought processes such as unrealistic optimism, egocentric attributions, and illusion of control were found to

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be positively correlated with happiness and negatively correlated with unhappiness (Alloy & Abramson, 1979; Greenwald, 1980; Miller & Ross, 1975; Taylor &; Brown, 1988; Weinstein, 1980).

Despite this growing body of evidence suggesting that both positive and negative thought processes have a significant influence on happiness (Fiske & Taylor, 1984; Haaga *et al.*, 1991; Taylor & Brown, 1988), little is known about the source of these thought processes. In other words it is not completely clear why some people engage in thought processes that enhance their happiness while others engage in thought processes that detract from their happiness. One possible answer is that people are predisposed to engage in these cognitive–evaluative thought processes. If indeed thought processes are the missing link between dispositions and subjective well-being, it is necessary to find a thought process which is linked to both of these constructs. Such a thought process is self-deception. Numerous studies suggest a strong influence of self-deception on happiness (Erez, 1994; Paulhus, 1986; Roth & Ingram, 1985; Sackeim, 1983; Sackeim & Gur, 1979). In addition, evidence suggests that self-deception is also associated with low levels of neuroticism (negative affectivity) and internal locus of control (Paulhus & Reid, 1991; Roth & Ingram, 1985; Sackeim & Gur, 1979). Thus, self-deception may serve as a link between dispositions and happiness.

Self-deception was defined by Sackeim and Gur (1978) as an unconscious tendency to see oneself in a positive light while denying information which threatens the self. According to these authors, four conditions describe self-deception. First, an individual holds two contradictory beliefs. Second, these two contradictory beliefs are held simultaneously. At face value these two conditions seem logically impossible since how can an individual believe in a proposition (e.g. it is raining) and its opposite (e.g. it is not raining) at the same time? However, the third condition provides clarification by stating that the individual must not be aware of holding one of these beliefs. This solution does not require a Freudian split of the mind but only that the self-deceiver can be aware of both a belief and a contradictory belief while overlooking the contradictory belief (Demos, 1960). Finally, the fourth condition holds that the individual must be motivated to determine which belief (s)he should be aware of and which (s)he should not notice. For example, as a graduate student, Mary had several papers accepted at top-level journals, leading her to believe that the review process was fair and accurately assessed quality research. However, as a new assistant professor at a leading University, the last five papers that she submitted to these same top-level journals were rejected. If Mary engages in self-deception, she will hold two contradictory beliefs simultaneously. One belief is that the review process is fair and accurately screens research, while the contradictory belief is that top-level journal reviewers are not open to Mary's innovative ideas and therefore are unfairly judging her recent work. Since Mary knows the importance of top-level publications for her tenure review, if she is to be happy it is likely she will focus more on the belief that the reviewers are unfair while overlooking the possibility that the review process is accurate and that her recent research may not be top quality.

Sackeim and Gur (1978) demonstrated empirically the existence of self-deception and provided solid evidence that this construct is comprised of the four conditions described (see Sackeim & Gur, 1978 for review). These authors along with others (Paulhus & Reid, 1991; Roth & Ingram, 1985) also provided evidence that self-deceivers are less depressed. In addition, all these authors found that well-adjusted individuals, those who are less negatively disposed as well as those who do not believe they are victims of fate, engage in self-deception. Their self-deception is manifested by holding positively biased views of themselves, ignoring minor criticisms, discounting failures, avoiding negative thoughts, and expecting a high level of success in new efforts (Zerbe & Paulhus, 1987). Accordingly, we hypothesize that self-deception may explain, in part, how dispositions such as affective disposition and locus of control influence subjective well-being. In other words, self-deception, as a thinking process, may mediate the relationship between dispositions and subjective well-being.

CAUSAL MODEL

A causal model was hypothesized which includes relationships between dispositions, self-deception, and subjective well-being. Figure 1 depicts the links contained in the hypothesized structural model. The links in this model are discussed below.
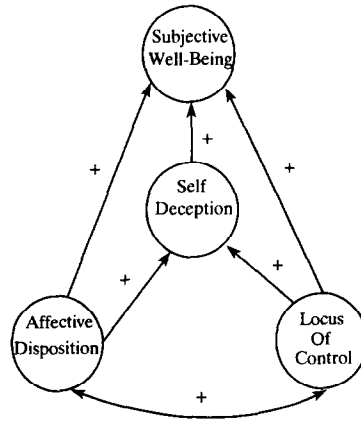
Fig. 1. Hypothesized structural relationships among affective disposition, self-deception, locus of control, and subjective well-being.

Self-deception to subjective well-being

The relationship between self-deception and depression was investigated by Sackeim and Gur (1979) and replicated by Roth and Ingram (1985). In both studies, a significant, negative correlation was found between these constructs. Sackeim and Gur (1979) interpreted their findings as evidence that non-depressed individuals exercise more reality distortion. Although these authors did not provide conclusive evidence that self-deception is directly related to subjective well-being, the significant negative correlation found between self-deception and depression is strongly suggestive of a relationship between self-deception and subjective well-being. Furthermore, non-self-deceivers were more subject to anxiety (Sackeim & Gur, 1979), while self-deceivers tended to show high self-esteem and high need for achievement (Paulhus, 1986). Thus, this evidence indicates that self-deception may play a positive role in enhancing the self. However, these results also question the difference between self-deception and simple pathological denial. Paulhus and Reid (1991) were able to answer this question by demonstrating that in addition to denial, self-deception contained a very strong ego-enhancement component as well. Furthermore, they found that enhancement was more negatively correlated with depression than denial, concluding that self-deception has an active role in enhancing happiness. Thus, self-deceivers not only block threatening information, but actively seek information to enhance the self. As such, these two mechanisms of the self-deception process may be responsible for the enhancement of subjective well-being. Consequently, on the basis of this past research, a link between self-deception and subjective well-being is included in the model represented in Fig. 1.

Affective disposition to self-deception

An array of empirical findings support the link between affective disposition and self-deception. For example, several correlational studies suggest significant negative associations between neuroticism and self-deception (Roth & Ingram, 1985, Sackeim & Gur, 1979). However, neuroticism is also the core of trait negative affectivity (Watson & Clark, 1984). Thus, this relationship may be interpreted as evidence that non-neurotic (low-NA) individuals exercise more reality distortion (self-deception) and are better adjusted (less depressed). The causal link from affective disposition to self-deception also is supported from a theoretical standpoint. Isen and Simmonds (1978) found that Ss in which positive affect had been induced tended to engage in activities that enhanced their positive affect and were less likely to engage in activities that they considered unpleasant. Isen, Shalker, Clark and Karp (1978) found that Ss in a positive affect condition encoded and recalled more frequently, positive material from memory. These results indicate that affect tendencies influence the way people scan, encode, and recall information. It is therefore reasonable to believe that positively disposed individuals tend to encode information in a positively biased manner to maintain their positive tendencies. In fact, Judge and Erez (1995) found some support for this proposition in three different samples. These authors found that positive disposition explained the gap between

individuals' reports and their significant others' reports of the focal individuals' happiness. This may be interpreted as an indication that positively disposed individuals are positively biased relative to their significant others in their views of their own happiness.

Self-deception is suggested to be one of the mental mechanism that increases positive assessments of situations (ignoring minor criticisms, discounting failures, and expecting success) (Zerbe & Paulhus, 1987). Thus, those who are positively disposed may use self-deception as a mechanism to increase positive assessments of situations which in turn increase their level of happiness. But how does self-deception influence the assessment of situations? Paulhus and Reid (1991) suggested that the self-deceiver continually distorts daily events to build positive esteem. When sufficiently strong, this esteem may act as a buffer to soften the impact of negative information. Taylor (1989) expanded upon this idea by suggesting that when threatening or "harmful-to-the-self" information is presented to ego enhancers, they turn to their assets and emphasize them to neutralize the threat. For example, if Mary is afraid of not getting tenure because her most recent papers were rejected, Mary can, when that thought occurs, direct her thought toward "I am a good researcher with innovative ideas and good researchers are rewarded with tenure." This thought then, helps Mary overcome the fear and accompanying decrease in subjective well-being. Thus, the link between affective disposition and self-deception is represented in Fig. 1.

Affective disposition to subjective well-being

Researchers have argued that mood-dispositional dimensions must be distinguished from how happy individuals are with their lives (Judge, 1990; Judge & Hulin, 1993; Judge & Locke, 1993; Levin & Stokes, 1989). While subjective well-being represents an ongoing state of psychological wellness (Diener, 1984), affective disposition is an individual's propensity to respond to groups of environmental stimuli in a predetermined mood-dispositional manner (Judge & Hulin, 1993). Consequently, although research has clearly demonstrated that affective disposition significantly influences SWB (Erez, 1994; Judge & Hulin, 1993; Judge & Locke, 1993), positive affective disposition is not necessarily the same as being happy (Judge & Hulin, 1993; Judge & Locke, 1993). Dispositional tendencies may be averted or improved by any number of environmental or person factors. For instance, individuals with positive dispositions might still be unhappy if they do not possess the thought processes that can lead to happiness. Although we believe that self-deception is a major thinking style that influences happiness, other thought processes held by positively disposed individuals, may also influence subjective well-being. Furthermore, as mentioned earlier, environmental factors may improve or avert some of the relationship between affective disposition and happiness. Thus, until these thought processes and factors are accounted for by research, a direct link between affective disposition and subjective well-being should be included in the model. This link is represented in Fig. 1.

Locus of control to subjective well-being

Past research has suggested that an individual's sense of control also may be an important part of happiness (Greenberger & Strasser, 1986). One explanation for this influence is that human beings have an 'innate need' to control their surroundings (White, 1959). Because this need for control may have a direct influence on the well-being of individuals, a lack of fulfillment of this need may result in low SWB. Another explanation could be that individuals attribute control to different sources: internal (self) and external (fate or chance). In turn, this may influence SWB. Rotter's (1966) work on locus of control (LOC) describes two types of individuals, high internals, those individuals who believe they can strongly influence change in their lives, and low internals, those individuals who believe they are victims of fate and thus have no direct control over their lives. If control does have an impact on SWB, Rotter's research implies that low internals will be less happy than high internals. Accordingly, past research has suggested that people who believe they have very little control over their environment are indeed depressed (Alloy & Abramson, 1979; Taylor, 1989). Thus, the relationship between locus of control and SWB is represented in Fig. 1.

Locus of control to self-deception

Internal locus of control has been found to be significantly related to self-deception (Paulhus & Reid, 1991). This finding has several theoretical explanations. Taylor (1989) proposed that false beliefs in control may be the driving forces behind pursuit of goals. Taylor suggested that because individuals need to see events as controllable, they select instances which support what they expect to happen. For example, in Mary's case, she wants to be in control of events leading to her tenure decision. If she is a strong internal, she will not focus on the influence of external factors such as the reviewers who are rejecting her papers, but rather that *she* is a good researcher and will eventually get tenure because of *her* innovative work. This false belief in control or illusion of control is argued to be a component of self-deception (Sackeim, 1983; Taylor, 1989; Taylor & Brown, 1988). According to Staw (1986), individuals who engage in illusion of control believe they are able to control events far more effectively than their actual ability suggests. Langer (1975) demonstrated this exaggerated sense of control in gamblers who ignored low odds of winning because they believed in their ability to roll the dice in such a way as to obtain their desired numbers. These examples demonstrate individuals' abilities to see themselves in a positive light while denying information which might suggest failure. As such, their self-deceptions are manifested by their illusions of control. By believing in their abilities to control situations internally, they deceive themselves into believing they will be successful. Thus, control may be linked to self-deception. Consequently, the link between locus of control and self-deception is represented in Fig. 1.

Control variables

Diener's (1984) review of the sources of subjective well-being was used to select age, race, marital status, income, and gender as the major demographic influences on subjective well-being. Finally, since many writers have suggested that health significantly influences life satisfaction (Diener, 1984; Near, Rice & Hunt, 1978), a measure of health was included in the model and hypothesized to influence subjective well-being.

METHOD

Setting and subjects

The setting for this study was a large public university located in the Midwest. Education of the participants was as follows: high school diploma = 36%, some college work or associate's degree = 43%, bachelor's degree = 9%, graduate degree = 12%. University records were matched to completed surveys indicating respondents' average annual salary was $21,214, the average age of respondents was 45.5 yr, 86% of respondents were white, and 68% were female.

Procedure

Surveys were mailed to a random sample of 700 individuals through campus mail. Focal Ss were asked to sign an informed consent form, describing the nature of the study, informing them about an honorarium to be paid as a result of completing a usable survey, and assuring them that all responses were confidential. Two-hundred and nineteen Ss returned usable surveys, representing a response rate of 31%. Using data from the university's records, respondents did not differ from nonrespondents with respect to any variable in the data base. Thus, the sample of respondents appears to be representative of the larger population of Ss.

Multiple measurements of the core constructs were employed to attain more reliable estimates. Since the constructs of interest in this study were psychological in nature, self-report data were considered an essential source of information on the main variables of interest. However, in an attempt to avoid single source bias often associated with self-reports, the focal Ss' subjective well-being was also evaluated from the perspective of a 'significant other' (i.e. a spouse or family member). By investigating the correlation between significant other reports and focal Ss reports, we should generate a more accurate, complete, and unbiased estimate of the focal Ss SWB. In addition, archival data were used. These three sources of information on SWB and demographic data should reduce halo and response set tendencies and increase the relevant heterogeneity of the measures (Roznowski &

Hanisch, 1990). Two-hundred and eleven usable significant other surveys were returned, indicating that for 96% of participating focal Ss, a significant other survey was also returned. Therefore, both self-report and significant other data were available for 211 Ss. No significant differences in respondent characteristics were found between those who had a significant other survey returned and those who did not. The relationships of significant others to respondents were as follows: spouse = 70%; close friend = 24%; parent or sibling = 6%.

Measures

Locus of control. Locus of control was measured using the Internal, Powerful Others, and Chance Scale (IPC; Levenson, 1981). The 24-item scale is multidimensional, consisting of three sub-scales. Internality measures the degree to which people believe they have control over their lives (e.g. "Whether or not I get into a car accident depends mostly on how good a driver I am"). The reliability measure for this portion of the scale was 0.66. The Powerful Others portion of this survey measures the belief individuals have that their life circumstances are controlled by other people (e.g. "My life is chiefly controlled by powerful others"). Coefficient alpha for this part of the scale was 0.78. The Chance Scale assesses how individuals feel chance plays a role in affecting their lives (e.g. "When I make plans, I am almost certain to make them work"). The reliability estimate for this portion of the scale was 0.77. Responses are based on a 7-point Likert-type scale ranging from 1 = *strongly disagree* to 7 = *strongly agree.*

In this study, only the Powerful Others and Chance Scales were used. According to Levenson (1981), the Powerful Others and Chance scales represent two facets of the externality orientation, while the Internal subscale represents a conceptually different dimension. Confirmatory factor analysis revealed that when all 24 items were loaded on one factor, the fit of the model was relatively poor. However, when items from the Powerful Others and Chance scales were loaded on one factor and items from the Internal scale on a second factor, the model resulted in a significant increase in the fit of the model (difference in $\chi^2 = 186.60$, with 1 df, $P < 0.01$) Although we had expected some change in the fit between these models, we had not expected such a dramatic increase. This increase in fit suggested that the internal sub-scale might measure some construct other than locus of control. Further investigation of items from the internal sub-scale revealed similarities to items depicting self-esteem (e.g. "when I make plans, I am almost certain to make them work"). Since we did not have a measure of self-esteem in this study, we were unable to examine these similarities more closely. As a result, since we suspected that this sub-scale might represent a construct other than locus of control, we dropped the Internal subscale from our analyses using only the Powerful Others and Chance subscales from the IPC.

Self-deception. Self-deception was measured using two instruments. First, a modified version of the Self-Deception Questionnaire (SDQ; Sackeim & Gur, 1978) was used. The original SDQ was developed on the assumption that individuals with an inclination for self-deception tend to deny having psychologically threatening thoughts or feelings. While this questionnaire was validated by a series of experiments by Sackeim and Gur (1978), a few of the original items were extremely sensitive and could not be used in organizational settings. For example one of the questions removed was "Have you ever doubted your sexual adequacy?". These items were replaced and the modified version of the SDQ consisted of 20 questions, all of which were meant to be psychologically threatening but with presumably universally true characteristics (e.g. "Do you ever feel guilty?"). Responses were anchored on a 1 (not at all) to 7 (very much so), scale. The coefficient alpha reliability estimate for the SDQ scale was 0.84.

Second, the Balance Inventory of Desirable Responding (BIDR; Paulhus, 1984) was employed. measuring two constructs: self-deception and impression management. Of interest to this study were the questions regarding self-deception, thus only that part of the survey was used (e g., "I don't care to know what other people really think of me"). The BIDR emphasizes exaggerated claims of positive cognitive attributes, focusing on ego enhancement. Respondents rated their agreement with each statement on a seven-point scale. The reliability estimate for the self-deception part of the BIDR was 0.69.

Affective disposition. The Neutral Objects Satisfaction Questionnaire (NOSQ). based on Weitz's (1952) survey, was used to measure affective disposition. The NOSQ was chosen because it has been found to be a better assessment of affective disposition (Judge & Bretz, 1993) than one of the most

commonly used measures of positive and negative affectivity, the Positive and Negative Affect Schedule (PANAS; Watson, Clark & Tellegen, 1988). The results of a study by Judge and Bretz (1993) suggested three factors which contribute to the advantages of the NOSQ. First, this measure avoids the controversial distinction between PA and NA. Furthermore, Judge and Bretz found that the NOSQ demonstrated greater stability over time than trait measures of PA and NA. Finally, a confirmatory factor analysis suggested that the NOSQ represents an underlying construct of affective disposition. Thus, affective disposition was measured by assessing how satisfied the respondent is with a list of mostly neutral objects common to everyday life (e.g. $8\frac{1}{2}$" x 11" paper, television programs, restaurant food). Individuals may tend to see things, including themselves, more favorably if they are highly satisfied with these neutral objects as a whole. The obverse is true as well. Judge (1990) modified this scale (Weitz, 1952) in several ways and the resulting survey was demonstrated to be a valid measure of affective disposition (Judge & Hulin, 1993). In the present study, the coefficient alpha for the scale was 0.74.

Subjective well-being. Four instruments were used to measure subjective well-being. All of them were completed by both focal Ss and significant others. Respondents completed a modified version of the Affect Balance Scale (see Diener, 1984), a list of 22 adjectives describing hedonic states (e.g. sad, happy, pleased, hopeless) (coefficient alphas: self-report = 0.91; significant other report = 0.92); the "percent time happy" item (Fordyce, 1977), which Diener (1984) concluded to have high validity as a single-item measure; a modified version of Underwood and Forming's (1980) mood measure, which contained 9 items with which respondents were asked to indicate their agreement (e.g. "I am usually quite cheerful"; coefficient alphas: self-report = 0.88; significant other report = 0.91); and the Satisfaction with Life Scale (Diener, Emmons, Larsen & Griffin, 1985), a five-item measure of life satisfaction consisting of such statements as, "In most ways my life is close to ideal" (coefficient alphas: self-report = 0.86; significant other report = 0.87). Using all four measures of subjective well-being assessed from two sources should yield a valid measure of the construct.

Health complaints. Health complaints were measured by asking the respondents to indicate if they had experienced any of the following physical conditions in the past year: difficulty breathing; excessive fatigue; insomnia; heart palpitations; hands sweating; and excessive nervousness. The frequency of occurrence of each symptom was rated on a 1 = never to 4 = often, scale. The reliability of this scale was 0.85, confirming that health problems are often interrelated (Bultena & Oyler, 1971).

Demographic information. Age, gender, income and race were measured through University archival data. Marital status was assessed by an individual question on the focal subject survey.

Analysis

In order to test our causal model, two types of analyses were used: hierarchical regression (Darlington, 1990) and structural equations modelling (Jöreskog & Sörbom, 1989). First, sequential hierarchical regression (Darlington, 1990) can determine if there is any indication of a mediation effect of self-deception on the relationship between dispositions and SWB. This is accomplished in two steps. The initial step determines if there is a unique effect of dispositions on SWB, not controlling for self-deception. If such an effect is not significant, then there is nothing to mediate. However, if a significant effect is found, then the next step is to determine if a unique portion of the SWB variance is explained by self-deception, controlling for dispositions. A unique effect followed by a drop in the effect size of dispositions may indicate a mediation effect through self-deception.

We employed covariance structure modelling for the second analysis because of a number of advantages it offered to our study. Such models allow the joint specification and estimation of the measurement model (e.g. the loadings of the measures on their hypothesized constructs) and the structural model (e.g. the relationships among the constructs) hypothesized to account for the observed data. Covariance structure models also correct the estimates for unreliability, providing more accurate estimates of the 'true' relations among the variables. Another advantage of covariance structure models is their ability to estimate indirect effects which provide important information on the overall effects of variables within the model (Hayduk, 1987). Finally, covariance structure models provide a wide range of statistics that aid in diagnosing the acceptability of a particular model. These fit statistics include chi-square (χ^2) with corresponding degrees of freedom (df), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI). However, these fit statistics are limited by their

dependence on the sample size. Consequently, we employed three other commonly accepted indices of fit statistics: Bentler's comparative fit index (CFI; 1990), Bollen's incremental fit index (IFI; 1988), and the Tucker–Lewis (1973) index. The combination of these statistics should provide a good overall measure of the fit of the model.

Using all these advantages of the structural equations modelling, the second analysis can confirm the findings of the hierarchical regression as well as test the extent of a mediation effect. Two models were required for the mediation analysis. In the first model, the direct effects of dispositions on SWB were assessed, not controlling for self-deception. The second model estimated the indirect effects of dispositions on SWB through self-deception. By comparing the fit of these nested models, we can determine if the fit significantly improves when the mediation effect of self-deception is added. Moreover, if the indirect effects are significant while there is a drop in the direct relationships, this is an indication of partial mediation. If the direct relationships drop to zero, full mediation is present. Further support for mediation occurs if the total effect estimated in the first model is equal to the sum of the direct and indirect effects estimated in the second model.

In an attempt to avoid single source bias often associated with self-reports, each model in this study was estimated using two sets of data. The first data set consisted of self-report responses only, while the second, hereafter referred to as mixed data, was based on a combination of both self-report and significant other responses (i.e. significant other reports of the SWB and self-reports of the indicators of self-deception, locus of control, and affective disposition). Thus, four models were estimated: Model 1a contained self-reports of direct relationships; Model 1b contained mixed data of direct relationships; Model 2a contained self-reports of direct and indirect relationships; and Model 2b contained mixed data of direct and indirect relationships. Consistent results across all models should increase the confidence in the results since the two sources reduce halo and response set tendencies (Roznowski & Hanisch, 1990).

RESULTS

The first objective of this study was to determine the contributions of self-deception on the variance in SWB beyond that explained by locus of control, and affective disposition. Two-step hierarchical regression analysis was performed on the following blocks of variables. At step 1, markers of seven objective life circumstance variables were entered: physical symptoms, gender, age, marital status, race, education, and income, as well as affective disposition and locus of control. As shown in Table 1, these variables explained 29.3% ($P < 0.01$) of the variance using self-reports of SWB and 22.4% ($P < 0.01$) using significant other reports. Affective disposition and locus of control significantly affected SWB in the self (0.19 and 0.05 respectively, $P < 0.05$) and mixed effect (0.11 and 0.03 respectively, $P < 0.05$) models. Thus, the first step indicated that there is an effect of dispositions on SWB that could possibly be mediated by other factors. Self-deception was entered in the second step. The incremental variance explained for self-reports was 8.97% ($P < 0.01$) and 5.13% ($P < 0.01$) for significant others. These results indicate that self-deception has a unique effect on SWB, separate from the influence of dispositions on SWB. However, including self-deception as a predictor also decreased the effect size of affective disposition and locus of control in both the self report model (from 0.19 to 0.15 for affective disposition and from 0.05 to 0.04 for locus of control) and significant other report model (from 0.11 to 0.08 for affective disposition and from 0.03 to 0.02 for locus of control). This indicates that further examination of a mediation effect is warranted.

The second objective of this study was to confirm the mediating effect of self-deception on the relationship between locus of control and affective disposition on SWB. Covariance structure modelling was used to examine this effect. The means, standard deviations and correlations of the relevant variables are presented in Table 2. A variance–covariance matrix was used as input to the program.

Measurement models

Fundamental to the integrity of the structural models tested is the assumption that the measures of the constructs are distinct (i.e. not essentially measures of the same construct). In fact, with respect to the subject of the present study, the distinction between affective disposition and subjective

Table 1. Hierarchical regression of self-deception, control, affective disposition, and health on subjective well-being

Variables on step	R^2	ΔR^2	F	df
Self-report data				
1. Gender, age, marital status, education, income, health, affective disposition, and locus of control	0.293		8.49*	1/205
2. Self-deception	0.383	0.089	11.50*	1/204
Mixed data				
1. Gender, age, marital status, education, income, and health, affective disposition, and locus of				
3. control	0.224		5.78*	1/200
4. Self-deception	0.276	0.051	6.88*	1/199

Note: *$P < 0.01$; N (self-report data) = 219; N (mixed data) = 211.

well-being may be questionable. We therefore conducted a confirmatory factor analysis on the constructs of this study. We developed four hierarchically nested models associated with different hypothesized factors. The constructs were represented as latent variables with scales and subsets of scales as indicators of the latent variables. The SDQ and the BIDR scales were loaded on the self-deception construct. The Satisfaction with Life Scale, Underwood and Forming's mood scale, the Affect Balance scale, and the "percent time happy" item, were loaded on the subjective well-being construct. Two of the three IPC subscales, Powerful Others and Chance, were loaded on the locus of control construct. Because the affective disposition construct had only one scale, we followed the recommendation of Schaubroeck, Ganster, & Fox (1992), by randomly assigning items to a number of sets in order to form indicators for the latent variables. Thus, two sets of 8 and one set of 9 randomly selected items formed the three indicators of the affective disposition construct.

The first most restricted model (the null model) consisted of 11 factors which corresponded to the 11 indicators. For the second model, we hypothesized 4 factors: subjective well-being, self-deception, locus of control and affective disposition. Each of the constructs, had two to four indicators that were allowed to load on their associated factors. Model 3 was designed to investigate the hypothesis that subjective well-being and affective disposition were not distinct factors. Model 3 therefore, consisted of 3 factors: self-deception, locus of control, and a factor combining subjective well-being and affective disposition. The four indicators of subjective well-being and the three indicators of affective disposition were allowed to load on the combined factor. The indicators of self-deception and locus of control were loaded on their corresponding factors. In the fourth model we hypothesized that the 4 constructs were not distinct. We therefore allowed the 11 measured variables to load on one factor. The indices of fit for these models are reported in Table 3.

Model 2, hypothesizing four factors, demonstrated significantly better fit indices compared with all the other models. Estimation of a single factor model, where the four measures all loaded on the same construct, provided a relatively poor fit to the data. Even forming the two most highly related constructs, subjective well-being and affective disposition, resulted in a significant decrease in fit over the hypothesized model. These results suggest that the measures are distinct. Subjective well-being and affective disposition do not appear to measure the same construct. Having demonstrated that the measures of subjective well-being and affective disposition were distinct, we next proceeded to estimate the hypothesized structural models.

The same confirmatory factor analysis was conducted for the mixed data model however, we now used the SWB indicators from significant other reports. The fit indices of the four models are reported in Table 3. The results are similar to that of the self-report model. Model 2, the one with the hypothesized four constructs, presented the best fit to the data suggesting that the constructs are indeed distinct. The loadings of the 11 indicators on the hypothesized model (Model 2) for the self-report and the mixed data models are presented in Table 4. All loadings were significant.

Table 2. Means (M), standard deviations (SD), and intercorrelations among variables used in LISREL analyses (Study 2)

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
Self-report														
1. Satisfaction with Life Scale	23.60	6.15	(86)											
2. Underwood & Froming Scale	48.39	8.23	46	(88)										
3. Fordyce Percent Happy Item	75.63	15.88	44	65	—									
4. Affects Balance Scale	78.04	9.48	51	76	69	(91)								
5. Neutral Objects Satisfaction Questionnaire	59.76	5.76	33	36	29	33	(74)							
6. Internality, Powerful Others, and Chance Scale	116.24	14.85	24	32	29	32	21	(81)						
7. Self-Deception Questionnaire	101.82	13.26	36	40	38	51	30	22	(84)					
8. Balance Inventory of Desirable Responding	86.00	12.04	30	30	32	42	25	31	53	(69)				
Significant other report														
9. Satisfaction with Life Scale	23.93	6.15	47	38	40	37	24	25	34	17	(87)			
10. Underwood & Froming Scale	47.78	9.99	25	52	47	48	27	18	32	21	62	(91)		
11. Fordyce Percent Happy Item	73.82	19.87	27	42	48	46	27	14	38	24	59	73	—	
12. Affects Balance Scale	73.56	9.81	26	48	39	50	25	27	37	25	58	76	66	(92)

Notes: Decimals are omitted from correlations. Coefficient alpha reliability estimates are in diagonals. Correlations greater than 0.17 are significant at the 0.01 level (two-tailed); other correlations are significant at the 0.05 level (two-tailed); $N = 217$.

Table 3. Indices of fit

Self-report data	χ^2	df	χ^2/df	GFI	AGFI	CFI	IFI	T&L
Null	970.46	55	17.64	0.45	0.34	—	—	—
Model 2 (4-factor)	58.43	38	1.54	0.96	0.92	0.98	0.98	0.97
Model 3 (3-factor)	187.07	41	4.56	0.86	0.78	0.84	0.84	0.79
Model 4 (1-factor)	319.07	44	7.25	0.79	0.69	0.70	0.70	0.62
Mixed-model data								
Null	960.2	55	17.46	0.47	0.36	—	—	—
Model 2 (4-factor)	57.64	38	1.52	0.96	0.92	0.98	0.98	0.97
Model 3 (3-factor)	213.16	41	5.20	0.85	0.75	0.81	0.81	0.75
Model 4 (1-factor)	364.41	44	8.28	0.76	0.64	0.65	0.65	0.56

Note: GFI = goodness of fit index; AGFI = adjusted goodness of fit index; CFI = Bentler's (1990) comparative fit index; IFI = Bollen's (1988) incremental fit index; T&L = Tucker–Lewis' (1973) fit index.

Structural models

Because one model fits the data well does not eliminate the possibility that other models might fit the data at least as well. As such, Hayduk (1987) encouraged researchers to test alternative models. Two structural models were developed in order to investigate the hypotheses that self-deception indeed mediates the relationship between dispositions and SWB. Since all the structural models were nested, we were able to compare the fit of the alternative model to the hypothesized one. In the first model, we permitted a causal relationship from affective disposition to subjective well-being, and from locus of control to subjective well-being. Thus, no indirect effects were specified in this model. Examination of the fit statistics of the first model suggests that the overall self-report and mixed hypothesized structural models fit the data acceptably. The fit statistics from the self-report model were as follows: $\chi^2 = 127.54$ ($df = 41$, $N = 219$), ns.; GFI = 0.90; AGF = 0.85; CFI = 0.91; IFI = 0.91; Tucker–Lewis index = 0.87. The fit statistics from the mixed data model were $\chi^2 = 93.57$ ($df = 41$, $N = 211$), ns.; GFI = 0.93; AGFI = 0.88; CFI = 0.94; IFI = 0.94; Tucker–Lewis index = 0.92. Figure 3 provides the parameter estimates of the first structural model with self-report and mixed data. Affective disposition significantly influenced subjective well-being; locus of control significantly influenced subjective well-being.
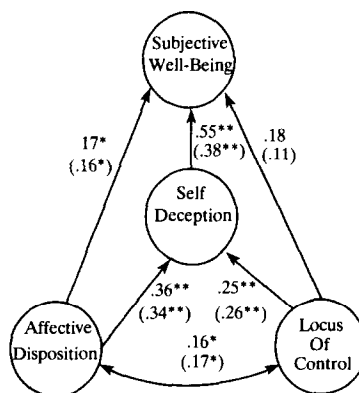

Fig. 2. Structural estimates of the direct and indirect relationships among affective disposition, self-deception, locus of control, and subjective well-being.

Table 4. Measurement model parameter estimates

Construct & Measure model	Self-report	Mixed-data
Subjective well-being		
Affect Balance Scale (ABS)	0.71	—
Underwood & Forming scale (UF)	0.57	—
Fordyce percent time happy (FOR)	1.00	—
Satisfaction With Life Scale (SWLS)	0.29	—
ABS, significant other report	—	0.51
UF, significant other report	—	0.55
FOR, significant other report	—	1.00
SWLS, significant other report	—	0.27
Self-deception		
Self-deception questionnaire (SDQ)	1.00	1.00
Balance Inventory of Desirable		
Responding (BIDR)	0.75	0.72
Affective disposition		
Neutral Objects Satisfaction		
Questionnaire (NOSQ), Subset 1	1.00	1.00
NOSQ, Subset 2	0.74	0.75
NOSQ, Subset 2	0.91	0.92
Locus of control		
Powerful Others subscale	1.00	1.00
Chance subscale	0.72	1.00

Note: All loadings are significant at the 0.01 level.

The second model included all the direct and indirect effects as indicated in Fig. 1. Examination of the fit statistics suggests that the overall self-report and mixed data hypothesized structural models fit the data acceptably. The fit statistics from the self-report model were as follows: $\chi^2 = 58.43$ ($df = 38$, $N = 219$), ns.; GFI = 0.96; AGFI = 0.92; CFI = 0.98; IFI = 0.98; Tucker–Lewis index = 0.97. The fit statistics from the mixed data model were $\chi^2 = 57.64$ ($df = 38$, $N = 211$), ns.; GFI = 0.96; AGFI = 0.92; CFI = 0.98; IFI = 0.98; Tucker–Lewis index = 0.97. Figure 2 provides the parameter estimates of the structural models with self-report and mixed data. Self-deception significantly influenced SWB; affective disposition significantly influenced self-deception and subjective well-being; locus of control significantly influenced subjective well-being and self-deception. The indirect effect of affective disposition on SWB mediated through self-deception, was 0.20 ($P < 0.01$) for the self-report model and 0.08 ($P < 0.01$) for the mixed data model. The indirect effect of locus of control on subjective well-being mediated through self-deception was 0.14 ($P < 0.01$) for the self-report model and 0.03 ($P < 0.01$) for the mixed data model. Although no causal direction between affective disposition and locus of control was hypothesized, we believe that some relationship between these constructs is warranted. Indeed, estimation of the non-causal relationship between affective disposition and locus of control was 0.16 ($P < 0.05$) for the self-report model and 0.17 ($P < 0.05$) for the mixed data model.
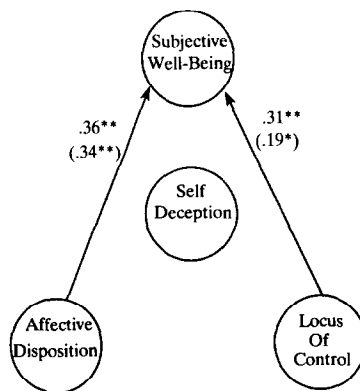

Fig. 3. Structural estimates of the direct relationships between affective disposition, and subjective well-being and locus of control and subjective well-being.

Comparing Models 1 and 2 reveal that Model 2 fits the data better. In other words, Model 1 resulted in a significant decrease in fit over the hypothesized Model 2 (difference in $\chi^2 = 69.11$ with 3 df, $P < 0.01$ for the self-report model and difference in $\chi^2 = 35.93$ with 3 df, $P < 0.01$ for the mixed data model). These results suggest that self-deception does mediate the relationship between dispositions and SWB. Furthermore, adding self-deception to Model 1 resulted in a decrease in the direct relationship between affective disposition and SWB, although the relationship remained significant. However, in the case of locus of control, the direct relationship dropped to an insignificant level, suggesting full mediation through self-deception. In addition, the sum of indirect and direct effects in Model 2 were approximately equal in magnitude to the direct effects exhibited in Model 1. This is another indication that the dispositions-SWB relationships are mediated through self-deception. Thus, overall, the results confirmed the hypotheses of this study.

DISCUSSION

Our research provides evidence that thinking styles such as self-deception may indeed play a significant role in influencing SWB. This is a role that is not directly accounted for by existing psychological theories of subjective well-being. Moreover, we demonstrated that self-deception mediates the relationship between affective disposition and SWB as well as locus of control and SWB. This particular finding provides a missing link in the top–down theory of SWB by partially explaining *how* personality is linked to SWB. Individuals who are positively disposed or have high expectations of control tend to use self-deception in order to maintain their happiness.

Although past research has found a significant, negative correlation between self-deception and depression, our study is the first to demonstrate that the influence of self-deception on SWB is significant and that affective disposition influences self-deception. In addition, our results suggest that a substantial part of the influence of affective disposition on subjective well-being is mediated through self-deception (54%). Thus, positively disposed individuals may use self-deception to overlook events which might interfere with their overall subjective well-being. For example, those individuals who do not use self-deception may be more aware of negative thoughts such as failures and therefore will be, in general, less happy than those positively disposed individuals who tend to ignore failures. Similarly, we found that locus of control significantly affected self-deception and that a substantial part of the influence of locus of control on subjective well-being is mediated through self-deception (43%). This supports past research which has already demonstrated that those who unrealistically think that they control their environment and have optimistic expectations from the future, are happier (Alloy & Abramson, 1979; Weinstein, 1980). These results are also in line with past research which suggests that self-deception and a high expectation of control are positively related to happiness (Sackeim & Gur, 1979; Taylor, 1989; Zerbe & Paulhus, 1987). Thus, high internals may use self-deception to overlook events which they cannot control and might interfere with their overall subjective well-being.

Our research may also provide some explanation for bottom–up theories of SWB. In specific, we offer evidence that different people can experience the same events but have different interpretations depending upon the thought processes used. For example, a negative correlation was found between self-deception and health complaints (-0.41, $P < 0.01$). This indicates that self-deceivers may discount minor health problems. Individuals who focus on minor health complaints have been shown to be less happy (Near *et al.*, 1978). Thus, ignoring these minor problems may increase an individual's level of subjective well-being. Accordingly, despite objective life circumstances, individuals who tend to engage in self-deception may be happier than those who do not use this type of thought process.

Two dispositional variables were found to influence happiness: locus of control and affective disposition. Both of these variables indicate that happiness is not entirely dependent on life events, but rather has 'within individual' stable components. As this study demonstrated, one potential explanation is that positive disposition and locus of control influence happiness through self-deception. Thus, individuals who tend to evaluate stimuli in a positive manner or tend to think they can control their environment do so by actively searching for positive and desirable cues while denying negative and undesirable ones. This, in turn, may affect their subjective well-being. However, since self-deception, affective disposition, and locus of control are distinct constructs, it is unlikely that the complete influence of affective disposition and locus of control on subjective well-being is

activated through self-deception. For example dysfunctional thought processes may mediate the relationship between negative disposition and SWB. Individuals who tend to evaluate things in a negative manner may overgeneralize from one small negative event to a whole domain of their lives. In turn, their level of happiness may decrease. Since we did not measure dysfunctional thought processes, we can only speculate about it's influence on SWB. However, this study did demonstrate the importance of thought processes as a mediating factor between dispositions and SWB. Future research may provide further insight by including other thought processes in the determination of how affective disposition and locus of control influence subjective well-being.

The data from significant others also supported our findings, although the results were weaker than those of the self-reports. Significant other reports were used to control for self-report bias. Our belief that significant other reports would be less susceptible to systematic error than self-reports was supported by our finding that the influences of dispositions and self-deception as biasing factors on SWB were weaker for all significant other results. On the other hand, the main purpose of our research was the investigation of the influence of thought processes on subjective well-being. It is unlikely that significant others would have as detailed an understanding of the internal thought processes of focal *S*s as the focal *S*s themselves. Thus, under these circumstances, significant other reports of SWB may be more susceptible to random error. Nonetheless, the true influence of thought processes on SWB probably lies somewhere between the self-report results and those of significant others.

One limitation of our research is that it only focused on self-deception as a mediating thought process. Consequently, we only provide a partial explanation for the influence of thought processes on SWB. While other thought processes may also mediate the relationship between dispositions and subjective well-being, this must be an area for future research. There are also some limitations in our analytic technique. Covariance structure models do not permit proof of causality, however, they do support inferences of causality (Hayduk, 1987; Jöreskog & Sörbom, 1989). In other words, for a model to be a confirmatory test of a causal inference, the model should only contain relationships of the form: A causes B and should not permit the possibility that B causes A. Therefore, relationships in structural models should be based on theory that imply only clear, one-way causal directions. Based upon theory and past research, most of our specifications of causal relationships conform to this condition. For example, affective disposition and locus of control have typically been viewed as traits (Judge & Hulin, 1993; Paulhus, 1986; Rotter, 1966; Sackeim, 1983) while subjective well-being has not. Thus a link from affective disposition or locus of control to subjective well-being is more reasonable, theoretically, than the converse. On the other hand, causal links that were not supported by theory, such as the link between affective disposition and locus of control, were included in the model as non-causal relationships.

It is also reasonable to assume that the causal direction involving self-deception is correct. While there is evidence that self-deception may be a dispositional tendency (Sackeim & Gur, 1979), it is also a thought process which is triggered by situations. One of the conditions of self-deception is the motivation factor. This condition means that if there is no reason or motivator to encourage self-deception, individuals will not engage in it. As such, self-deception is more likely to mediate the relationships between affective disposition or locus of control and subjective well-being rather than directly predicting dispositions. However, as with most studies dealing with attitudinal or 'soft' data, it is possible to question the causal relationship among the variables (Meehl, 1978). Thus, the hypothesized relationships specified in this model should be interpreted as "more or less reasonable relative to alternative specification" (Jöreskog & Sörbom, 1989).

Despite these limitations, our study makes a number of contributions to research on personality and subjective well-being. In particular, our study demonstrates how personality influences subjective well-being through self-deception. This finding may provide a missing link in the top–down as well as bottom–up theories of SWB by providing an explanation of *how* personality is linked to SWB. While our investigation is preliminary, our results have opened up many opportunities for future research. For example, one could explore other thought processes (e.g. perfectionism, overgeneralization, ignoring minor criticism, rationalizing, etc.) and their individual contributions to subjective well-being, or how affective disposition influences the development of specific thought processes, or even how life circumstances are interpreted through thought processes. In sum, while we believe thought processes have been a neglected issue in the subjective well-being literature, our research offers some new insight and paves the way for many further contributions.

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