

177

SELF-ENHANCING ILLUSIONS AND MENTAL HEALTH:
A LONGITUDINAL PANEL LATENT-VARIABLE STRUCTURAL
EQUATION MODEL

BY

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A Thesis
Submitted to the Faculty of Graduate Studies
in Partial Fulfillment of the Requirements
for the Degree of

DOCTOR OF PHILOSOPHY

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Table of Contents

	page
Introduction.....	6
Traditional views.....	6
A revised view.....	13
The social desirability literature.....	15
The social-cognition literature.....	31
The narcissism literature.....	41
Other possible self-report measures of SEI.....	49
Conceptual bridges for self-enhancing illusions.....	52
Longitudinal Research.....	54
Purpose of the present study.....	57
Hypotheses.....	61
Method.....	63
Subjects.....	63
Measures.....	63
Procedure.....	68
Results.....	70
Confirmatory factor analyses.....	76
Measurement Model.....	98
Panel LVSEM analysis.....	102
Discussion.....	115
References.....	129
Appendix 1.....	151
Appendix 2.....	159
Appendix 3.....	160
Appendix 4.....	162
Appendix 5.....	164

List of Tables and Figures

	page
Table 1. Summary Statistics for Primary Variables.....	71
Table 2. Summary Statistics for SCL-90-R Variables.....	73
Table 3. Exploratory Factor Analysis of NPI on Time One Sample.....	78
Table 4. Confirmatory Factor Analysis of NPI on Time Two Sample....	81
Table 5. Exploratory Factor Analysis of BIDR on Time One Sample....	85
Table 6. Confirmatory Factor Analysis of BIDR on Time Two Sample...	89
Table 7. Exploratory Factor Analysis of SOCQ on Time One Sample....	91
Table 8. Confirmatory Factor Analysis of SOCQ on Time Two Sample...	93
Table 9. Exploratory Factor Analysis of SCL-90-R on Time One Sample.....	96
Table 10. Confirmatory Factor Analysis of SCL-90-R on Time Two Sample.....	97
Table 11. Correlation Matrix of Primary Variables (Revised).....	99
Table 12. Means, Standard Deviations, and Cronbach Alphas of Revised Scales.....	100
Figure 1. Maximum-likelihood solution (GSI).....	103
Figure 2. GLS solution (arbitrary distribution theory) (GSI).....	108
Figure 3. Model comparisons.....	110
Table 13. Summary of Cross-Lagged Parameters.....	114

ABSTRACT

A theoretical relationship between self-enhancing illusions and emotional well-being was reviewed from the perspective of research literatures addressing: (a) socially-desirable responding in self-report measures, (b) self-serving bias effects identified in social cognition research, and (c) studies of narcissistic personality functioning. It was proposed that self-enhancing illusions (SEI) have a salutary effect on psychopathological symptoms. A longitudinal panel latent-variable structural equation model (EQS) was used to test this effect. An SEI latent variable was defined by the Balanced Inventory of Desirable Responding-6 (Paulhus, 1989), the Narcissistic Personality Inventory (Raskin & Hall, 1979), and the Self-Other Comparison Questionnaire (developed by the author). Symptomatic distress was measured by the Symptom Check List 90 - Revised (Derogatis, 1983). Results indicated that earlier self-enhancing illusions predicted decreases in the intensity of symptomatic distress ten weeks later, although SEI was not associated with lower overall numbers of symptoms. The relationship between self-enhancing illusions and symptomatic distress is discussed.

Self-enhancing illusions and mental health:

A longitudinal panel latent-variable structural equation model

This research addresses the question of whether non-veridical beliefs about the self are associated with psychological health. In particular, it will be argued that self-enhancing illusions¹ (SEI) play an adaptive role by helping people to reduce negative psychological states. A longitudinal panel latent-variable structural-equation model will be described that empirically tests this relationship.

Non-veridical beliefs and mental health: Traditional views.

"The Truth" has nearly always been held up as an ultimate good. Discovering what is true or right is a driving principle underlying any search for knowledge, whether philosophical, scientific, or aesthetic. Certainly the purpose of the present research project was to investigate the nature of "real" psychological phenomenon and to make statements about them that can be considered "true".

It will be argued, however, that non-veridical knowledge also has an important role to play in human affairs. A view that

¹. The term illusion, as an overgeneralized, overoptimistic, or wishful conception of reality, is preferred over such terms as delusion or bias, which imply greater inflexibility and prejudice than is intended. In accordance with the basic idea of this research, illusions are potentially more benign and helpful. Similar arguments in favour of the term illusion are also given by Taylor (1989) and Janoff-Bulman (1992), two leading writers in this area.

such activities as lying and deception are common, sometimes even adaptive, phenomenon in everyday life is being increasingly acknowledged (see Lewis & Saarni, 1993). To quote Solomon (1993):

The obvious truth is that our simplest social relationships could not exist without the opaque medium of the lie. (p. 33).

He later continues with a study of the personal value of non-veridical information:

Lying thus supplies a mechanism for selfhood and marks off the separation of one consciousness from another. It provides the means of protecting one's private thoughts and forbidden fantasies. Self-deception further reinforces individuality by supplying the unrealistic dreams and fantasies that allow a person to cope and thrive in difficult or even impossible circumstances. (p. 50).

This distinction between non-veridical information from the self to the self (i.e., self-deception) and non-veridical information from the self to others (i.e., lying or other-deception) is an important one. The present research is a study of deception of the self by the self, specifically the impact of illusory self-flattery on emotional well-being. In this paper, this phenomenon will be referred to as "self-enhancing illusions", defined as sincere beliefs about the self that exaggerate positive traits and deny negative traits, contrary to objective evidence, and which are motivated by a need for self-care. These self-assessments appear genuine to the individual but, in fact, involve selective or creative perceptions of self-

relevant information.

Interest in the veridicality of self-knowledge is at least as old as the day when someone carved "Know thyself" on the temple of Apollo at Delphi. The richest analyses of the value and consequences of self-referent non-veridical beliefs are found in the philosophical, psychological, and ethical studies of the phenomenon of self-deception (see McLaughlin & Rorty, 1988). Martin (1986) has reviewed this literature and differentiated between four traditional moral perspectives of self-deception. These four traditions will be briefly described as a basis for examining differing psychological perspectives on self-enhancing illusions.

The first is the Inner Hypocrisy tradition. From this perspective, self-deception is a derivative wrong, leading to moral corruption and harm to others. It is alleged that by attacking the veracity of inter-personal and intra-personal communication, lying and deception destroys the very social fabric upon which human civilization is built. One arm of this tradition is a conservative Christianity, such as that found in the sermons of Bishop Joseph Butler. Butler condemned self-deceit in matters of personal vice as "a very great part of the wickedness of the world" (Gladstone, 1896, p. 19). Another arm is based on principles of strict scientific ethics, such as the ideal that "it is wrong always, everywhere, and for anyone, to believe anything upon insufficient evidence" (Clifford, 1879, p.

186). According to this tradition, self-deceivers deserve our condemnation for being sinners and cheats.

Second, is the Authenticity tradition, advocated most strongly by Existentialists. In this case, self-deception is viewed as a serious threat to authenticity, defined as being able to choose one's self while confronting significant truths. It is argued that human beings have a responsibility to attain authenticity by avoiding self-deception. Premier among this group was Sartre (1958), who judged self-deception to be "bad faith", a failure to acknowledge the freedom to create values and an impediment to an authentic existence. In another essay (Sartre, 1975), he brutally condemned self-deceivers as "cowards and scum" (p.366), suggesting that he perhaps held to the Inner Hypocrisy perspective as well. Becker (1973), in a gentler analysis, described the denial of reality and the inflation of personal character as a necessary, if inauthentic, means for coping with existential vicissitudes, especially relating to one's own death. Self-deception and self-inflation are interpreted as normal "neuroses" which block a higher form of existence but which are functionally convenient for the majority of us to cling to. Here, self-deceivers are seen as existing beneath their human potential, at least until they can be shocked into awareness by the stripping away of their delusional avoidance of truth.

Martin's third perspective of self-deception, and the one

most familiar to many psychologists, is the Moral Ambiguity tradition. According to this view, self-deceivers exhibit a lack of self-awareness due to mental illness or due to genetic or social factors beyond their control. Self-deception is, therefore, undesirable but not necessarily immoral. Freud, for example, conceptualized the ego defenses of neurotics as strategies for avoiding threatening internal impulses or external dangers². Similarly, Fingarette (1969) concluded that self-deception interfered with true self-understanding and represented a disavowal of personal agency. In modern cognitive psychology, the relation between psychopathology and distorted or unrealistic thinking is explicit (Beck, 1976). Even the contemporary transpersonal movement advocates the belief that the true self may only be reached when self-deception is transcended (Vaughan, 1985). In general, descriptions of the psychologically healthy person have prominently displayed realistic perceptions and accurate cognitions as essential components (Jahoda, 1958; Valliant, 1977). Here self-deceivers are to be viewed with sympathy and offered treatment or education.

². Although Freud clearly believed that an avoidance of reality underlay psychopathology (see Sackeim, 1983), he was not committed to the view that all self-deceivers are mentally ill. In his book Psychopathology of Everyday Life, for example, he described how normal individuals are capable of such unconscious censorship as dreaming, forgetting, and slips of the tongue (Freud, 1901/1951). Anticipating the phenomenon of self-enhancement, Alfred Adler also discussed feelings of inferiority and strivings for superiority, characteristic of both neurotic and normal individuals, in relation to mental health (see Ansbacher & Ansbacher, 1956).

Finally, Martin defined the Vital Lie tradition. From this perspective, consistent with the orientation of the present study, self-deception services human need by providing a means for coping with a harsh world. According to this interpretation, self-deceivers are advantaged and disturbance of their non-veridical beliefs is unnecessary and even cruel.

The Vital Lie tradition is relatively obscure and proponents of it have generally been on the fringes of mainstream thought. Some examples of this tradition have emerged from modern literature, such as Eugene O'Neill's The Iceman Cometh, Henrik Ibsen's The Wild Duck, and the plays of Luigi Pirandello (Bentley, 1952), all of which explore in some way the protective role of self-enhancing illusions.

A few social theorists have also clearly endorsed self-enhancing illusions as beneficial. For example, the British pragmatist Schiller (1924) wrote that:

The ordinary man could hardly carry on, could he not delude himself into the belief that, in some ways at least, he was more than ordinary. A certain amount of self-deception, therefore, is universal and salutary.
(p.174)

An even firmer endorsement of the adaptive value of self-enhancing illusions was given by Rank (1936), who wrote:

With the truth, one cannot live. To be able to live one needs illusions, not only outer illusions such as art, religion, philosophy, science and love afford, but inner illusions which first condition the outer [i.e., a secure sense of one's active powers and of being able to count on the powers of others]. The more a man can take reality as truth, appearance as essence, the sounder, the better adjusted, the happier he will

be...this constantly effective process of self-deceiving, pretending and blundering, is no psychopathological mechanism [pp. 251-252].

This strong position has been the exception rather than the rule, however. More typically, what might be defined as "soft" perspectives within the Vital Lie tradition are presented. It is more generally argued that the potential positive role of self-deception should be accepted, but not supported. In other words, self-deception is necessary because we are limited creatures, but the implied ideal is to strive to transcend it.

An early illustration of this perspective is found in Bousfield (1923) in his study of self-deception and self-care. He stated that:

A certain amount of self-love, self-appreciation, self-importance, and self-consciousness of one's own capacities is necessary in everyone; without it we would be ill prepared to cope with men and circumstances.

although,

...like the salt in cooking; a little is essential to bring out the flavour, but a very little more spoils the whole dish (p. 178).

Another more recent example of a similar view can be found in Piper (1988), who writes:

We cannot possibly make rationally intelligible everything that happens to us or everything we feel and do, without threatening the coherence of that which we do think we understand rationally. So we cannot possibly integrate all such events without undermining our agency. Rather than do this, we systematically distort and truncate our understanding, with the help of our rational capacities themselves, so as to achieve the illusion of rationality (p. 298).

In brief, we manufacture a "pseudo-rational" response to our personal imperfections within an incomprehensible world simply in order to survive. Nevertheless, in spite of its inevitability, Piper recommends that pseudo-rationality should be minimized through a courageous confrontation of our subjective failings.

Similar views are presented by Baron (1985) in an essay titled "What is wrong with self-deception?":

To make sense out of what we see, we must focus and must interpret; and it is difficult to prevent wishful thinking and fear from affecting what we attend to and how we interpret it (p. 443).

Again, self-deception is ambivalently accepted as inevitable but regrettable.

Finally, Shean (1993) used similar logic when he defined delusions, such as those observed in clinical populations, as "purposive attempts to create meaning, as constructions intended to preserve a sense of identity and social connectedness under extreme circumstances" (p.45). By describing the similarity in form between self-deceptive statements made by delusional psychiatric patients and published statements made by public figures, he illustrated that delusional beliefs are on a continuum with everyday illusions exhibited by most people.

Non-veridical beliefs and mental health: A revised view.

To summarize, most theories of optimal human functioning have been strongly influenced by the rationalistic and realistic principles that are endemic to Western civilization. Fundamental to this standard view is the premise that accurate self-knowledge

is at the heart of healthy psychological functioning. Interest in the potential value of inaccurate self-knowledge, however, has increased significantly in the past few years (see Taylor & Brown, 1988; Taylor, 1989; Janoff-Bulman, 1992). Some have even suggested that the recent work on the relation between non-veridical self-knowledge and mental health may later be recognized as a dramatic paradigm shift in modern psychology (Gibbons & McCoy, 1991).

In the remainder of this section, the evolution of such a revised perspective of non-veridical beliefs and mental health will be traced through three relatively independent literatures in psychological science. One literature originated in the philosophy of self-deception and branched off into the psychology of socially-desirable responding (SDR) as a methodological artifact in research and a contaminant of self-report measures. The second literature traces the discovery of phenomenon such as the self-serving bias reported in social cognition research. The third literature focuses on the personality trait of narcissism.

In each of these literatures, the position that self-enhancing illusions may have adaptive value for developing and maintaining psychological health has emerged, contradicting the original assumptions of these areas. In each case, unexpected results have encouraged some researchers to reinterpret their data in ways which are inconsistent with the traditional realistic view of mental health.

The social desirability literature.

For as long as psychologists have conducted personality research, they have confronted the problem of the veridicality of self-report measures (for a review see Merydith & Wallbrown, 1991). Early stimulus-response experiments revealed thought processes characterized by particular patterns of error or "response sets". Research on the development of methods of personality assessment also confronted the problem of dissimulation on self-report inventories (e.g., the use of validity scales on the MMPI). Most particularly, however, researchers have been interested in finding ways to control the biasing effects of overly favourable self-presentation or socially-desirable responding. Beginning with Edwards (1953), efforts were made to improve the validity of objective personality assessment by developing measures that were less "contaminated" by social desirability effects. Later work by Crowne and Marlowe (1960) produced the Crowne-Marlowe Social Desirability Scale³, which probably continues to be the most frequently used indicator of socially desirable responding today.

It is from within this tradition of identifying and controlling dissimulated self-reports that psychologists became most interested in the possible existence of the phenomenon of

³. Interestingly, Crowne and Marlowe originally rejected Edwards' social desirability scale as confounded by psychopathology. Later in this review, it will be suggested that this "confound" actually represents a meaningful association between self-enhancing illusions and emotional wellbeing.

self-deception. The next section will review some of the theoretical perspectives on self-deception in psychology and, more specifically, some of the methods used for measuring it.

Self-deception: Some psychological perspectives.

Psychologists have used a variety of psychological theories to explain self-deception. A typical example is that of Snyder (1985) who defines it as: "the process of holding two conflicting self-referential beliefs, with the more negative belief being less within awareness" (p. 35). Self-deception, in this conceptualization, is a cognitive behaviour (i.e., thought avoidance) motivated and reinforced by a need for the preservation of a sense of personal worth.

Another popular psychological approach to explaining self-deception is to utilize the information-processing models of modern cognitive (Wilson, 1985) and social psychology research (Chanowitz & Langer, 1985; Gilbert & Cooper, 1985). From this perspective, self-deception is conceptualized as schema-mediated selective attention. For example, a person who views herself as intelligent may register and retain more evidence that supports this belief, while failing to register and retain contrary evidence. A cognitive schema filters reality to produce a self-benefitting partial-reality.

Psychoanalytic theory has also been used as the basis for a psychological theory of self-deception (Sackeim, 1983). Sackeim reworks psychoanalytic assumptions and argues that (a) people may

distort reality in order to seek pleasure, (b) depth of processing effects may produce cognitive biases without dual processing being necessary, (c) self-deceptive practices may promote psychological health, and (d) psychological therapy may at times be more appropriate if it encourages falsity in the patient's beliefs. This work, along with that of Greenwald (1980) and Lazarus (1983), represents one of the earliest of the new wave of theoretical and empirical investigations interested in the advantages of self-enhancing illusions.

Self-deception and socially-desirable responding. The study of the phenomenon of self-deception was accelerated by the development of a convenient self-report measure called the Self-Deception Questionnaire (SDQ) (Sackeim & Gur, 1978). Following the classic psychodynamic theory of defense, the SDQ is composed of items which are judged to be universally true but are psychologically threatening (for example, having sexual fantasies, thinking about suicide, or enjoying bowel movements). Failing to endorse such an item is regarded as evidence of unconscious distortion of self-knowledge. In conjunction with the SDQ, Sackeim and Gur (1978) also constructed the Other Deception Questionnaire (ODQ), composed of items of socially desirable but statistically infrequent behaviours (for example, never having stolen something from a store, always telling the truth, or always apologizing for mistakes). In this case, endorsement of an item is seen as representing a conscious

attempt to appear more attractive to others.

The SDQ and the ODQ have become an important part of the literature on socially-desirable responding (SDR) and thus provide a link between the philosophy of self-deception and modern psychological research methods. In the next section, these measures and others will be discussed in terms of their relationship to self-enhancing illusions.

Two-factor models of SDR: The BIDR. Paulhus (1984) factor analyzed the SDQ and the ODQ, as well as several other commonly-used social desirability scales, and observed a two-factor structure, similar to what had been previously identified in the literature (Block, 1965; Wiggins, 1964). One factor was identified by the SDQ and the SD scale (Edwards, 1957); the other factor by the ODQ, the Sd scale (Wiggins, 1959), and the MMPI Lie scale (Meehl & Hathaway, 1946). The Marlowe-Crowne scale loaded on both factors. These two factors were named Self-Deception and Impression-Management, respectively, and were interpreted as support for the distinction made between unconscious and conscious deception⁴. Paulhus argued that if the deception was unconscious (i.e., if a nonfactual self-statement is sincerely believed to be true) then it may not be appropriate to control

⁴. Similar structures are evident in some related works. For example, Zelen (1987) describes an internalized "actor" (acting self) perspective of attribution that is associated with self-enhancement, in contrast to an internalized "observer" (observing self) perspective that is associated with self-monitoring, an internalized parallel to social feedback.

for a self-deceptive bias in self-report research, in contrast to impression-management which may represent a legitimate methodological confound. To illustrate this point he showed how conditions of anonymous versus public disclosure significantly affected only the impression-management scales.

Paulhus (1984) also rewrote the SDQ and ODQ items by (a) wording items as affirmations, (b) balancing the number of attribution and denial items, and (c) replacing the maladjustment-laden items (see Paulhus, 1989). This revised questionnaire, labelled the Balanced Inventory of Desirable Responding (BIDR), was subjected to a confirmatory factor analysis that verified the two-factor structure of socially-desirable responding.

The latest BIDR (Version 6) constructed by Paulhus (1989) represents a further development in the instrument, especially in the self-deception scale which had showed low correlations between positively-keyed and negatively-keyed items. This revision (based on factor analyses of a pool of 60 new items) produced a transformation in the content of the self-deception scale, which Paulhus interpreted as an indicator of "ego-enhancement" instead of "ego-defense". Self-deception was now viewed as exaggerated confidence in positive cognitive attributes, such as judgement and rationality⁵. In effect, the

⁵. A sample positive item from the self-deception scale is "I always know why I like things". A sample negative item is "I don't always know the reasons why I do things". Subsequent analyses

theoretical foundation of the scale shifted from traditional psychodynamic (i.e., defensive avoidance of a psychological threat) to contemporary cognitive (i.e., nonveridical beliefs motivated by a rewarding emotional state).

Repeating his earlier dimensional studies of socially-desirable responding, Paulhus (1989) factor analyzed the BIDR-6 with Gough's (1972) Good Impression Scale, Edwards' (1957) SD scale, the Marlowe-Crowne SD scale (Crowne & Marlowe, 1960), Jackson's (1967) Desirability (Dy) scale, Schuessler et al.'s (1978) RD-16, and the Eysenck Personality Inventory Lie scale (Eysenck & Eysenck, 1964). As before, self-deception and impression-management emerged as independent factors: the first marked by Edwards SD, the PRF Desirability, the RD-16, and the BIDR-6 self-deception scale (renamed self-deceptive enhancement: SDE); and the second marked by the Eysenck Lie scale and the impression-management (IM) scale of the BIDR-6. The Marlowe-Crowne and the CPI Gi loaded on both factors.

Correlations between the SDQ and psychological functioning.

Most researchers linking the SDQ with other indicators of psychological functioning have been interested in controlling for socially-desirable responding as a possible methodological confound. Some of this data will be reviewed here, but will be

reported by Paulhus are of the combined scale only. The correlation of the positive and negative subscales was not indicated in the available version of Paulhus (1989), which was under review. Presumably, the issue of subscale correlation within the self-deception scale had been addressed and solved.

reinterpreted as evidence supporting a relationship between self-enhancing illusions and psychological wellbeing.

Sackeim and Gur (1979) observed significant negative correlations between the Self-Deception Questionnaire (SDQ) and self-reported depression ($r = -.34$), neuroticism ($r = -.34$), and manifest symptoms ($r = -.48$). These correlations were interpreted by the authors as evidence of a response bias contributing to a lack of validity in these self-report measures of psychopathology. In short, the greater the correlation, the greater the response distortion. Another way to interpret these data, however, is to view the SDQ as a measure of self-enhancing illusion associated with genuinely low levels of psychopathology. This is, notably, the same interpretation of the role of self-deception offered by Sackeim (1983) a number of years later.

Roth and Ingram (1985) obtained a similar level of correlation between depression and the SDQ ($r = -.34$, $p < .001$). However, this relationship was interpreted as veridical, rather than as evidence of a self-deceptive response bias. Similarly, Flett, Blankstein, Pliner, and Bator (1988) observed correlations between the SDQ and frequency ($r = -.38$, $p < .001$), intensity ($r = -.28$, $p < .01$), and duration ($r = -.32$, $p < .01$) of negative emotion and between frequency ($r = .33$, $p < .001$) and duration ($r = .34$, $p < .001$) of positive emotion. These authors also observed significant negative correlations between the SDQ and anger experiences.

Over time, especially after the review of self-enhancing illusions by Taylor and Brown (1988), researchers have increasingly viewed some social-desirability measures, such as the SDQ, as indicators of adaptive personality functioning. For example, Starek and Keating (1991) observed that success at competitive swimming (qualifying for a national championship) was associated with self-deception, as measured by the SDQ and by the avoidance of negative words on a binocular-rivalry task. They hypothesized that self-deception operated as a cognitive strategy that enhanced motivation and performance in athletic competition.

Similarly, Edwards (1991) observed that high-scorers on the SDQ displayed superior levels of performance following failure, especially when the context offered an excuse or was sufficiently ambiguous to permit a self-deceptive response. The adaptive function of self-deception was also noted by Kiersky (1992) who found that SDQ scores predicted response to treatment and longer-term recovery of patients receiving ECT for major depressive episodes.

Following Paulhus's revision of the SDQ, Linden, Paulhus, and Dobson (1986) found negative correlations between the BIDR-3 self-deception scale and self-reports of physical symptoms ($r = -.25$, $p < .05$), cognitive anxiety ($r = -.35$, $p < .05$), somatic anxiety ($r = -.29$, $p < .05$), state anxiety ($r = -.49$, $p < .05$), and depression ($r = -.39$, $p < .05$). The "stylistic minimization" of the person's disturbing thoughts was interpreted as potentially

adaptive. In contrast, Sabourin et al. (1989) interpreted a correlation between the BIDR-3 self-deception scale and psychological distress in individuals seeking therapy ($r = -.52$, $p < .01$) as evidence of "contamination" of the distress measure.

In a series of studies, Paulhus (1989) demonstrated how the BIDR-6 self-deceptive enhancement scale tapped subjects' ratings of confidence about a memory task that were not contingent on accurate knowledge. The SDE was also shown to be related to extroversion ($r = .38$, $p < .01$), conscientiousness ($r = .24$, $p < .01$), openness ($r = .32$, $p < .01$), self-esteem ($r = .50$, $p < .01$), and vocational decisiveness ($r = .49$, $p < .01$). The SDE was also negatively related to neuroticism ($r = -.41$, $p < .01$), trait anxiety ($r = -.52$, $p < .01$), and depression ($r = -.31$, $p < .01$). In contrast, the primary associations of IM were agreeableness ($r = .35$, $p < .01$) and conscientiousness ($r = .33$, $p < .01$). Summarizing, Paulhus concluded that SDE appears to tap an exaggerated self-confidence which is lacking in insight, yet is somehow linked to psychological adjustment. In contrast, he interpreted IM as tapping a dimension of social conventionality.

Interestingly, to assess whether SDE was simply another measure of adjustment, Paulhus (1989) asked raters to assess the degree of adjustment indicated in items of the BIDR, the Marlowe-Crowne, Edwards' SD scale, Jackson's Dy scale, and the Rosenberg self-esteem scale. He observed that the items on the SDE and IM scales of the BIDR were considered to be neutral on adjustment,

which was not the case for Edwards' SD, Jackson's Dy, and the self-esteem scale.

The status of socially-desirable responding (SDR) as a contaminant in self-report measures as assessed by the BIDR was also examined by Zerbe and Paulhus (1987). These authors concluded that when SDR can be conceptually related to other variables of interest, controlling it as a contaminant may be inappropriate. Presumably, this would more likely be the case for self-deception than it would for impression-management, given the conscious dissembling implied by the former. Zerbe and Paulhus commented that: "Self-deceivers are likely to be better adjusted, to be more ego-resilient, to report greater control over decisions, and to have a higher expectations that effort leads to rewards" (p. 260). Obviously they have gone beyond viewing social desirability as a mere response-style bias and have moved into considering it as a substantive variable of potentially greater interest (see also Lockard and Paulhus, 1988).

Related socially-desirable responding measures. The factor analytic work of Paulhus suggests that research using other measures of SDR which are on the same dimension as SDE, in particular Edwards' SD scale (ESDS) and Jackson's PRF Desirability scale (PRF-D), may provide some additional data in this area. The studies reviewed in this section recapitulate the emergence of this dimension of SDR from its status as a

methodological problem to a meaningful cognitive pattern related to psychological adjustment.

An illustration of the traditional interpretation of SDR effects can be found in Rock (1981), who obtained correlations of .69 and .72 between the ESDS and two self-report measures of assertiveness. This relationship was explained as a confound and the reader is cautioned to be careful in the use of these particular assertiveness measures. Obviously, from the revised theoretical framework of later researchers, this observed relationship is entirely consistent with the view that some dimensions of SDR are related to healthier psychological functioning.

In other examples, studies of the relationship between suicide, hopelessness, and social desirability have shown that the ESDS correlated with the Beck Hopelessness Scale (BHS) in a sample of Seattle shoppers ($r = -.67$) (Linehan & Neilson, 1981) and in a sample of psychiatric inpatients ($r = -.58$, $p < .05$) (Linehan & Neilsen, 1983). These results were interpreted as evidence of a confound in the hopelessness measure due to its correlation with an SDR index (misleadingly identified as impression-management in this case). Nevid (1983) criticized this interpretation and argued that the covariation between these measures was due to a predictable overlap in their content, an interpretation which preserves the construct validity of the BHS. Furthermore, Ivanoff and Sung (1991) determined that the ESDS interacts with

the BHS to predict suicidality in prisoners (i.e., the ability of hopelessness to predict suicidality decreases as social desirability increases). Ivanoff and Sung also observed that the ESDS was a significant predictor of lower depression.

A similar difference in interpretation is found in the literature on subjective well-being. Carstensen and Cone (1983) found that the ESDS correlated .70 and .58 with two popular measures of psychological well-being, prompting the authors to recommend extensive refinements to both scales. In reply, Kozma and Stones (1988) conducted a study finding correlations ranging from .58 to .82 between the ESDS and three measures of well-being in three age groups. However, in this case, the authors interpreted these results as evidence that the ESDS is a moderately good measure of well-being, rather than an indicator of response bias.

An example of a transitional article would be Sommers-Flanagan and Sommers-Flanagan (1987) who, after finding a correlation of $r = -.41$ between the ESDS and Rotter's Locus of Control scale, offered two alternative interpretations: (a) that Rotter's scale is contaminated by SDR, or (b) that SDR may be a personality trait that covaries with locus of control.

McCrae and Costa (1983) referred to this as the "substance versus style" controversy, with the "substance" perspective reinterpreting the correlation between a personality scale and an SDR indicator as a product of content overlap between the two

scales, which would be unwise to factor out as mere stylistic variance. They even suggested that labels given to SDR measures, which usually involve such terms as "lie" and "deception", should be changed so that such alternate interpretations of self-report data can be more easily offered.

Views such as this have generated a lively debate in the literature. For example, in a reply to criticism by Edwards (1990) and Walsh (1990), Nicholson and Hogan (1990) stated that:

If social desirability contaminates responses to self-report measures of personality, one would expect that controlling for the response bias would enhance validity coefficients (correlations between the personality scale and external criteria). However, there is no evidence in these studies that validity coefficients are enhanced when social desirability is controlled. On the contrary, validity coefficients are in fact reduced when social desirability is controlled. Consequently, social desirability does not appear to contaminate responses to self-report measures of personality. What we assert is that the correlation between many personality scales and social desirability scales can be attributed to content overlap and that this overlap accounts for the reduction in validity coefficients when social desirability is controlled. (p. 290-291).

For example, in a study comparing family self-report measures with clinician ratings of family functioning, Fristad (1988) expected that social desirability (as measured by the Family Social Desirability Scale) would act as a suppressor variable (i.e., controlling for SDR would enhance the similarity between self-report and clinician ratings). Instead, social desirability was found to significantly negatively correlate with ratings of pathology and that the SDR effect could be not removed without a loss of meaningful variance.

More latent variable research on SDR measures. Holden and Fekken (1989) examined the underlying factor structure of three SDR measures, the Edwards' SD, Jackson's PRF-D, and the Marlowe-Crowne, and derived two higher order factors: the first composed of the four ESDS first-order factors (clear thinking, healthiness, social responsibility, and helpfulness) and five PRF-D first-order factors (concentration, coping, social integration, self-assurance, and calmness); and the second composed of five Marlowe-Crowne first-order factors (considerateness, endurance, patience, integrity, and adherence to social norms). These SDR dimensions were labelled Sense of Own General Capability and Interpersonal Sensitivity, respectively. Notice the similarity in meaning between these factor labels and Paulhus's (1989) interpretations of the SDE and IM scales of his BIDR as exaggerated self-confidence and social conventionality, even though entirely different items are used. In a follow-up study, Holden, Mendonca, and Serin (1989) described the Sense of Own General Capability factor as representing "focused and realistic thinking, social integration, self-confidence, and hardiness", and the Interpersonal Sensitivity factor as representing "considerateness, social sensitivity, and tolerance" (p. 500). Employing a sample of suicidal psychiatric patients, the authors observed the relationship between Sense of Own General Capability (operationalized by Jackson's PRF-D scale), hopelessness, and

suicidality. Results showed that the prediction of suicidality was most parsimoniously explained as a function of hopelessness and the interaction of hopelessness and Sense of Own General Capability. In other words, when feelings of hopelessness were high, the PRF-D appeared to buffer the link between hopelessness and suicidality.

In a comparable study of hopelessness, depression, parasuicide, and social desirability, Cole (1988) used latent-variable structural equation models to disentangle some of the confusion in the area. In addition, he examined clinical and nonclinical samples to assess the generalizability of his results. The three SDR measures that Cole selected were the ESDS, the Marlowe-Crowne, and the MMPI K scale. The MMPI K scale has been associated with psychological health (see Sackeim, 1983), so, along with the inclusion of the ESDS, the SDR latent variable in this study could be interpreted as an indicator of self-enhancing illusion, although this was not what Cole had intended. Results showed that of the three SDR scales, only the ESDS was significantly different between the two groups, with the nonclinical group being higher. The SDR latent variable was primarily composed of a combination of the ESDS and the MMPI K scale. This latent variable showed significant negative correlations with the other latent variables of depression ($r = -.64$), hopelessness ($r = -.46$), and parasuicide ($r = -.35$) in the nonclinical group and with depression ($r = -.65$), hopelessness

($r = -.50$), and parasuicide ($r = -.45$) in the clinical group. Thus, the previously observed relationship between some SDR measures and psychopathology had again been found.

Topics related to self-deception. There exist a number of other areas in the psychological literature where the adaptive value of non-veridical knowledge is addressed. One such area is in research on the adaptive value of denial in medical patients. In general, the denial of the seriousness of a medical condition has been observed to be potentially beneficial. For example, Hackett and Cassem (1974) found that cardiac patients who denied the seriousness of their illness were more likely to survive an acute episode. Similarly, denial has been correlated with fewer complications in surgical patients (Cohen & Lazarus, 1973). In another study, denial in hemodialysis patients was found to be a common coping mechanism and appeared to be associated with less depression and a lower sense of helpless dependence (Yanaguida, Streltzer, & Siemson, 1981). Evidence linking optimism with physical health benefits prompts similar arguments (Peterson & Bossio, 1991). Finally, Taylor (1983) discusses the role that illusions may play in helping women cope with breast cancer.

The value of non-veridical knowledge is also suggested within the literature on suggestibility. For example, Schumaker (1991) has argued that dissociated consciousness and a susceptibility to suggestion (the acceptance of a proposition without adequate logical basis) helps human beings to cope with

overwhelming extraneous stimuli, to transcend a painful reality, to promote social harmony, to buffer the effects of trauma, and to foster health-promoting emotional catharsis and self-illusions. Similarly, Gibbons and McCoy (1991) have argued that the maintenance of beneficial self-illusions is associated with a reduction in "burden" of accurate self-awareness, such as when a person enters a state of greater suggestibility.

The social-cognition literature

The next major area reviewed for evidence of adaptive self-enhancing illusions is in the experimental social psychology literature. Much of this research stems from the study of types of cognitive errors that people characteristically exhibit when they are asked to provide information about themselves. Examples of such research include the self-serving attributional bias (see Schlenker, Weigold, & Hallam, 1990), the "above average" effect (see Dunning, Meyerowitz, & Holzberg, 1989), and the overconfidence effect (see Vallone, Griffin, Lin, & Ross, 1990). The common link between these constructs (and to socially desirable responding/self-deception as well) is a pattern of non-veridical, self-aggrandizing belief. Hence the relevance of this research literature to the present study.

Within this social-cognition framework, Taylor and Brown's (1988) review of this literature is the most frequently cited reference for the view that there is a meaningful relationship between self-enhancing illusions and psychological well-being.

They extract from their review three basic types of positive illusions: (a) unrealistically positive self-evaluations, (b) exaggerated perceptions of control or mastery, and (c) unrealistic optimism⁶. Taylor and Brown also illustrate how SEI may assist in the promotion of various other criteria of psychological health, including happiness, capacity for productive work, and ability to care. In particular, they suggest that SEI may be adaptive for helping the person confront adversity.

Reaction to this view of the relationship between non-veridical beliefs and wellbeing has been mixed. Some have endorsed self-enhancing illusions as worthy of promotion in, for example, the context of psychological counselling (Miller, 1989). Others view self-enhancing illusions as undesirable because they may increase the likelihood of ineffective self-management and of

⁶. Some interesting comparisons exist between Taylor and Brown's three categories of SEI and Antonovsky's (1979) Sense of Coherence (SOC), defined as a pervasive and dynamic feeling of confidence. In particular, Antonovsky breaks SOC down into three components: (a) comprehensibility (the extent to which one's world is predictable), (b) manageability (the availability of resources which may be controlled), and (c) meaningfulness (seeing life's challenges as valuable and worthwhile engaging). Furthermore, Taylor and Brown's categories mirror Janoff-Bulman's (1989a) basic world assumptions of (a) perceived benevolence of the world, (b) meaningfulness of the world, and (c) worthiness of the self. All three perspectives assume that confronting existence with a positive attitude about one's self, the world, and the relation between the two promotes well-being.

failure' (Baumeister, Heatherton, & Tice, 1993).

Work based on the revised perspective of non-veridical self-knowledge has continued, however. Taylor, Collins, Skokan, and Aspinwall (1989) further clarified the relationship between SEI and mental health by contrasting repression with illusion. These authors suggest that SEI should not be confused with a defense mechanism like repression because (a) repression denies reality, whereas illusion only distorts it; (b) repression leads to an absence of both positive and negative emotion, whereas SEI seems only to mute negative affect; (c) repression is associated with general life dysfunction, whereas SEI is linked to increased sociability, creativity, persistence, and higher aspirations; and (d) repression increases and becomes more rigid in response to threat, whereas SEI has the potential to respond to reality and to adapt to threat. At the heart of this distinction made by Taylor et al. is the "paradoxical" nature of SEI, where SEI facilitates positive affect, yet remains responsive to negative information.

⁷. Subjects with high self-esteem actually showed superior self-regulation (and greater success) relative to low self-esteem subjects, except under a condition of ego-threat ("If you think that you will choke, you might want to play it safe"). In fact, when challenged by the ego-threat condition, higher self-esteem subjects gave more effort (increased their speed of performance) relative to low self-esteem subjects. Unfortunately, one feature of the task used by Baumeister, Heatherton, and Tice (1993) was that it rewarded conservative (slower) performance, therefore when subjects with inflated self-views gave more effort and took greater risks they were consistently punished relative to their more cautious peers. Obviously if the task rewarded increased effort, then the results of this study could have been quite different.

Baumeister's (1989) "optimal margin of illusion" offers a related idea (see also Doan & Gray, 1992; Janoff-Bulman, 1989; Snyder, 1989). According to this perspective, moderate distortion in a positive direction is associated with optimal psychological functioning. However, when the distortion is more extreme, reaching, for example, the level of mania or psychosis, then the person is exhibiting clearly dysfunctional behaviour.

The following section reviews some of the prominent research in the social cognition literature related to the SEI. Topics will be organized according to the categories of SEI discussed by Taylor and Brown (1988).

Positive illusions relating to self-esteem. Unrealistically positive views of the self have been identified in normal subjects in several types of research. For example, causal attribution studies have found that most people exhibit a self-serving bias, meaning that they tend to attribute positive but not negative outcomes to the self (see Bradley, 1978; Miller & Ross, 1975, for reviews). Greenwald (1980) proposed that this causal asymmetry was the result of a "beneffectance bias", motivated by a need to enhance self-esteem.

Research on self-other⁸ comparisons has identified similar non-veridical self-judgements. For example, on tasks involving

⁸. A typical self-other comparison measure would involve subjects rating themselves on various attributes relative to the general population, frequently on a percentile scale ranging from 0% to 100%.

rating themselves in comparison to rating the "average person", subjects tend to report more desirable and less undesirable traits (Alicke, 1985; Brown, 1986), more control over positive events (Wright, Zautra, & Braver, 1985), and tend to reject the characteristics of mental illness (O'Mahony, 1982). In each case this self-other bias was interpreted by the authors as potentially adaptive self-enhancement.

Baumgardner (1990) used a self-other comparison measure, called the Latitude of Self-Description Questionnaire, to observe that perceived (not necessarily accurate) self-certainty led to positive self-affect and egotism. These results were interpreted as consistent with the views of Taylor and Brown (1988). Similarly, Pelham and Swann (1989) used a measure called the Self Attributes Questionnaire to determine that subjects who rated their positive self-views as more certain and more important were highest in self-esteem. However, in this case, Pelham and Swann interpreted their results as inconsistent with the views of Taylor and Brown. Specifically, they argue that the "frame" of an individual's self-view (i.e., the certainty and importance that is given it) provides a context within which distortion-free self-perception may be achieved. What Pelham and Swann fail to appreciate, however, is that the selection of this "frame" is itself subject to a self-enhancing bias.

Illusions of control. Normal subjects have been observed to overestimate the degree of control that they can exert over

outcomes which are in reality due to chance, referred to as the "illusion of control" (Langer & Roth, 1975). Just as people seem to be motivated to enhance their self-esteem, they appear to have a need to feel in control of their outcomes. Burger and Cooper (1979) have attempted to measure this motivation by developing the Desirability of Control Scale. Subjects who score high in this scale have been observed to be more likely to form illusory perceptions of control over chance events (Burger, 1986). Interestingly, further research in this area by Burger, McWard, and LaTorre (1989) suggested that in many cases an illusion of control may be more closely tied to well-being than actual control over events.

Unrealistic optimism. Research on self-other comparisons has also shown that normal subjects tend to believe that positive events are more likely to occur for them than for the "average person" (Weinstein, 1980). A person may believe that the future of the world will be good in general, but according to this research, predictions that refer to the self in particular will be especially bright.

More recently, Wolfe and Grosch (1990) observed that positive affect (assessed by measures of self-esteem and optimism) and social-intellectual skills (assessed by self-monitoring, objectivism, need for cognition, and self-efficacy) correlated significantly with confidence of decisions on three types of problem solving tasks after accuracy of decisions was

partialled out (defined as illusory confidence). These partial correlations between variables of adaptive personality functioning and decision confidence (after accuracy was removed) ranged from .14 to .23. These results were interpreted as consistent with Taylor and Brown's (1988) views on unrealistic optimism.

In a study of breast cancer patients, Taylor (1992) found that perceived invulnerability (or unrealistic optimism) predicted psychological adjustment. Furthermore, perceived invulnerability was not significantly related to the frequency of self-protective behaviours, which contradicted earlier predictions by other researchers that this relationship would be negative.

Self-enhancing illusions in depression research. The effects of cognitive patterns on emotional well-being have been examined directly in research comparing depressed and nondepressed subjects. This literature is made even more convincing because it developed from an assumption that non-veridical beliefs of a negative or self-derogating variety are an underlying cause of psychopathology (see Beck, 1967). This self-derogating illusion hypothesis is, of course, the mirror argument to the self-enhancement perspective given in this paper. Studies demonstrating the revised perspective with samples of depressed and nondepressed subjects will be reviewed in the next section, organized according to Taylor and Brown's (1988) triad of self-

enhancing illusions⁹.

Depression and the illusion of control. The "sadder but wiser" paper of Alloy and Abramson (1979) has become a classic in this area. Results showed that nondepressed subjects inaccurately estimated their control over outcomes whereas, contrary to expectation, depressed subjects demonstrated accurate judgements of contingency. This is, of course, antithetic to the traditional view of mental health that psychopathology is associated with poorer reality contact.

The "depressive realism" of depressed subjects and the "illusion of control" found in nondepressed subjects appear to be consistent effects and have been demonstrated in continuing research (Alloy & Abramson, 1982; Dobson & Franche, 1989; Martin, Abramson, & Alloy, 1984). This has forced the researchers in this area to reject the traditional non-veridical-cognition/psychopathology perspective and propose a reformulation that incorporates self-enhancing illusion. Quoting Abramson and Alloy (1981):

...contrary to cognitive theories of depression, the depressive's problem is not that he or she suffers from the presence of depressogenic cognitive biases, but rather that he or she suffers from an absence of the

⁹. Notice the similarity between Taylor and Brown's three self-enhancing illusions of self-esteem, control, and optimism to Beck's (1976) cognitive triad of (a) negative view of self, (b) negative view of the world, and (c) negative view of the future, as the characterizing features of depressive cognition. Both perspectives are similar in form, except that the SEI theory does not hold to the axiom that mental health must be confined to the realm of reality.

nondepressive cognitive biases" (p. 445).

Depression and unrealistically positive views of the self.

In a study about the effects of depression on the processing of personal information about the self and others, Kuiper and MacDonald (1982) observed that mild depressives appeared to exhibit a balanced (veridical) view of themselves and of others, whereas nondepressed subjects exhibited an unbalanced (non-veridical) view (more positive for themselves, more negative for others). These results were interpreted as evidence of an "ego-protective" bias in the nondepressed.

Tabachnik, Crocker, and Alloy (1983), using self-other comparison methodology, observed that nondepressed subjects perceived themselves to be better than others. The authors argue that this self-enhancing bias may be adaptive and contribute to a more positive self-image, whether these perceptions are veridical or not. Interestingly, nondepressed subjects did not show biased perceptions when making judgements of others, only when making judgements of themselves. In comparison, depressed subjects were more accurate overall.

A similar effect is observed by Lewinsohn, Mischel, Chaplin, and Barton (1980), where objective observers rating nondepressed subjects in a group-interaction task rated them as less positive on a number of personality traits than those subjects rated themselves. In contrast, depressed subjects' ratings of their social competence were consistent with those given by the

observers.

Depression and unrealistic optimism. Depressed subjects tend to be less optimistic than nondepressed subjects (Alloy & Ahrens, 1987; Pyszczynski, Holt, & Greenberg, 1987). Nondepressed subjects typically overestimate their probability of success and underestimate their probability of failure. As with the other self-enhancing illusions, the absence of unrealistic optimism is implicated in the etiology of depression by these researchers.

In summary, Taylor and Brown's (1988) typology of illusions (pertaining to self-esteem, self-control, and prediction of the future) conveniently reflects specific categories of research in the literature. However, such distinctions made between types of illusions may be somewhat arbitrary. For example, McKenna (1993) suggests that previous research on the phenomenon of unrealistic optimism may have been confounded by illusions of control. He offers experimental evidence that illusions about being the causal source of positive outcomes have more adaptive value for a person than simply making illusory predictions about positive outcomes (without causal involvement).

Similarly, Sigmon and Snyder (1993) refer to two (not three) primary assumptions of biased self-concept: "I am a good person" and "I am in control most of the time". They argue that these "valence-related" and "linkage-related" assumptions underlie the positively biased perceptions of the self that are associated

with psychological health. Notice, however, that optimism about the future is not included as a feature of their "rose-colored mirror". This narrower system of classification has some appeal because it limits the content of self-enhancing illusions to particular attributes of the self only and does not include any non-self features of the world.

To conclude, the social cognition literature, like the social-desirability literature, has also discovered a need to utilize non-veridical self-enhancing illusions in order to interpret various research findings. Cognitive biases have become an accepted part of normal functioning and, from the depression data, certain types of these non-veridical cognitions have become implicated in theories about the maintenance of emotional well-being.

The narcissism literature.

A perspective within the literature on narcissistic personality functioning represents the third major area to be examined for evidence of self-enhancing illusions. Obviously, narcissism is consistent with non-veridical self-aggrandizement, although it has generally been associated with psychological dysfunction. There exists, however, a view that a certain type of narcissism is adaptive and associated with healthy functioning.

The concept of narcissism emerged out of the psychoanalytic literature (see Mitchell, 1986, for a review). Freud argued that

narcissistic illusions were primitive and infantile and, when found in an adult, represented a withdrawal from reality (i.e., a neurotic defense) which must be addressed in therapy. Subsequent work by Klein and Kernberg further maintained that narcissistic grandiosity was pathological and required direct and vigorous interpretation.

Mitchell (1986) described an alternative view of narcissism proposed by such psychoanalytic theorists as Winnicott and Kohut. From this perspective, infantile narcissism and subsequent narcissistic illusions are the foundation of creative growth. For example, Mitchell summarized Winnicott's view of health as the:

...freedom to move back and forth between the harsh light of objective reality to the soothing ambiguities of lofty self-absorption and grandeur in subjective omnipotence. (pp. 114-115)

Similarly, he summarized Kohut's view of narcissistic illusions as a part of healthy development, such that:

These phenomenon represent not a defensive retreat from reality, but the growing edge of an aborted developmental process which has stalled because of parental failure to allow the child sustained experiences of illusions of grandeur and idealization. (p. 116)

From this alternative perspective, the "treatment" of the patient exhibiting narcissistic illusions involves a nonconfrontational and warm acceptance of the patient's non-veridical self-presentation in order to revitalize disrupted self-development. The therapist attempts to become the "good parent" necessary to renew the patient's healthy maturational

processes. Mitchell concluded that healthy narcissism is characterized by a playful and flexible movement between illusion and reality, where a rigid fixation in either domain would expose the individual to a greater risk of psychopathology.

A similar perspective is expressed by Weiner and White (1982), who discuss depression as the emotional pain resulting from the loss of the valued self. The "lost object", in this case, are the grandiose and omnipotent fantasies that underlie the patient's pathological narcissism. The goal of therapy is, therefore, to assist the patient in discarding these fantasies and to develop a positive cathexis to a cohesive self (i.e., "healthy narcissism").

Empirical research concerned with the development of self-report measures of narcissistic personality functioning has also begun to explore the adaptive role of grandiose illusions. As with most of the other research reviewed so far, however, the development of this line of inquiry was originally unintended and was largely based on the appearance of anomalous results.

Of the various measures of narcissism in existence, the NPI has been the most popular (see Raskin & Terry, 1988). It was originally derived from the DSM-III criteria (American Psychiatric Association, 1980) for narcissistic personality disorder, although it was designed to be used with nonclinical populations as well (Raskin & Hall, 1979). These criteria included grandiose self-importance, idealistic fantasies,

exhibitionism, emotional indifference or hypersensitivity, feelings of entitlement, exploitativeness, and lack of empathy.

Clearly, a high score on the NPI was not predicted by the test designers to be a positive result. What has been unusual with the NPI, however, is that empirical work has produced a rather complex portrait of its underlying factor structure. Certain aspects of the NPI may be measuring something that has desirable consequences for a person. An assertion of this paper is that this desirable construct represents another example of self-enhancing illusions.

Factor analytic studies of the NPI. There is fairly good evidence that the NPI as a whole measures something that other narcissism measures do not. Mullins and Kopelman (1988) found low correlations between the NPI and three other narcissism scales. Supporting this dimensional difference, a factor analysis of the items in the four measures produced one NPI factor separate from the others, labelled "desire for attention, admiration, and authority". Furthermore, this study found that the NPI correlated with a need to achieve ($r=.42$, $p<.001$) and with need for autonomy ($r=.22$, $p<.001$), whereas the other scales correlated less significantly or not at all.

Emmons (1984) derived four factors from the NPI, labelled exploitativeness/entitlement (E/E), leadership/authority (L/A), superiority/arrogance (S/A), and self-absorption/self-admiration (S/S). When correlated with various personality variables some

distinctions emerged between these four factors. A sense of these differences may be inferred from a list of the largest of these correlations: (a) exploitativeness/entitlement showed positive correlations with suspiciousness, dominance, neuroticism, extraversion, tension, aggression, and achievement and negative correlations with tender-mindedness; (b) leadership/authority showed positive correlations with extraversion, dominance, social boldness, self-esteem, self-monitoring, need for uniqueness, warmth, tough pose, and exhibitionism and negative correlations with social anxiety, self-ideal discrepancy, and neuroticism; (c) superiority/arrogance showed positive correlations with dominance, social boldness, independence, self-esteem, tough pose, need for uniqueness, and extraversion and negative correlations with self-ideal discrepancy, and social anxiety; and finally, (d) self-absorption/self-admiration showed positive correlations with need for uniqueness, self-esteem, extraversion, and self-monitoring and negative correlations with self-ideal discrepancy, and neuroticism. Emmons interprets these relationships to be evidence that E/E represents a dimension of maladaptive narcissism, whereas L/A, S/A, and S/S represent dimensions of adaptive narcissism.

Emmons (1987) confirmed his earlier four-factor results on the NPI, except that order of the proportion of variance was different (i.e., L/A, S/S, S/A, and E/E, respectively).

Similarly, the maladaptive character of E/E was reinforced because it was the only factor to correlate with two other measures of narcissism and with negative self-focus ($r=.28$, $p<.05$), unlike L/A which correlated negatively with negative self-focus ($r=-.38$, $p<.01$). Complimentary results were also found by Shulman and Ferguson (1988), who observed that L/A and S/A did not correlate with a projective measure of narcissism.

In their own factor analytic study of the NPI, Raskin and Terry (1988) obtained seven components: authority, self-sufficiency, superiority, exhibitionism, exploitativeness, vanity, and entitlement¹⁰. Correlations between observer ratings and these components indicated that each is seen to be characterized by different personality features: (a) authority by dominance, assertiveness, leadership, criticality, and self-confidence; (b) self-sufficiency by assertiveness, independence, self-confidence, and need for achievement; (c) superiority by capacity for status, social presence, self-confidence, and narcissistic ego-inflation; (d) exhibitionism by sensation-seeking, extraversion, and lack of impulse control; (e) exploitativeness by rebelliousness, nonconformity, hostility, and lack of consideration for others; (f) vanity by physical

¹⁰. Items from the Emmons (1984, 1987) factor Leadership/Authority contributed most to Authority; items from Self-Absorption/Self-Admiration contributed most to Superiority, Vanity, and Self-Sufficiency; items from Superiority/Arrogance contributed most to Exploitativeness and Exhibitionism; and items from Exploitativeness/Entitlement contributed most to Entitlement, Exploitativeness, and Exhibitionism.

attractiveness; and, finally, (h) entitlement by ambitiousness, need for power, dominance, hostility, toughness, and lack of self-control and tolerance for others. In addition, authority and superiority showed significant correlations with subjects' real-self to ideal-self congruency. In summary, the NPI is a multi-dimensional instrument, with underlying components that appear both desirable-adaptive and undesirable-maladaptive.

In a study by Raskin and Novacek (1989) examining the relationship between the NPI and the MMPI, results indicated that, when compared to each other, "adaptive" narcissism (i.e., authority, self-sufficiency, and superiority) was characterized by greater ego mastery, higher morale and need for affection, and better physical health. In contrast, "maladaptive" narcissism (i.e., entitlement, exhibitionism, and exploitativeness) was characterized by more alienation, depression, family problems, ideas of persecution, amoral values, manic symptoms, psychoticism, ego inflation, authority conflict, and hostility. An MMPI index of general maladjustment also correlated significantly with exploitativeness ($r=.20$), entitlement ($r=.19$), and exhibitionism ($r=.16$). Authority, however, correlated negatively with the same index ($r=-.16$).

Other researchers have utilized Emmons' four-factor model of the NPI to explore the meaning of its underlying structure. This research has produced some surprising results. For example, Watson, Grisham, Trotter, and Biderman (1984) observed

correlations between the Hogan Empathy Scale and leadership/authority ($r=.28$, $p<.001$) and with self-absorption/self-admiration ($r=.16$, $p<.05$), a result which was unexpected given the theoretical base of the NPI.

Interesting correlations were also found between the Edwards SD scale and leadership/authority ($r=.21$, $p<.01$) and between exploitativeness/entitlement ($r=-.34$, $p<.001$). Recall that the ESDS can be interpreted as a measure of self-deceptive enhancement, suggesting therefore that some components of the NPI may be tapping self-enhancing illusions.

Watson, Taylor, and Morris (1987) also found that the three dimensions of "adaptive narcissism" (i.e., leadership, superiority, and self-absorption) correlated positively with self-esteem and negatively with depression. In addition, when the effects of adaptive and maladaptive narcissism were "purified" using partial correlations, these relationships, and the inverse ones for exploitativeness, were accentuated. Similarly, inverse correlations have been reported between personal distress and L/A ($r=-.23$, $p<.01$) and S/A ($r=-.26$, $p<.001$) (Watson & Morris, 1991). Surprisingly, when the variance of E/E was removed, L/A was also observed to correlate with social responsibility (partial $r=.21$, $p<.01$).

Jackson, Ervin, and Hodge (1992) have found significant positive correlations between Rosenberg's Self Esteem scale and "adjusted" narcissism (L/A, $r=.35$; S/S, $r=.36$; and S/A, $r=.21$).

These three adaptive narcissism factors (L/A, S/S, and S/A) have also been associated with greater assertiveness and less goal instability, empathic distress, depression, and anxiety (Watson, McKinney, Hawkins, & Morris, 1988) and with lower endorsement of pathogenic irrational beliefs (Watson & Morris, 1990). Overall, these differential associations may be interpreted as evidence that the NPI measures aspects of both healthy and unhealthy narcissism.

Other possible self-report measures of SEI.

In addition to the measures already discussed, there exist in the literature some other potential candidates for interpretation as measures of self-enhancing illusions. For example, Roth, Snyder, and Pace (1986) developed a self-report scale purported to measure unrealistically positive self-enhancement, labelled the Self-Presentation Scale. This scale correlated with both depression ($r = -.30$, $p < .001$) and self-esteem ($r = .26$, $p < .001$). These results were interpreted as evidence that unrealistically attributing positive characteristics to the self maintained psychological well-being.

Ingram (1989) discussed the Positive Automatic Thoughts Questionnaire (ATQ; Ingram & Wisnicki, 1988) which, as a compliment to the negative ATQ, was designed to assess recurrent self-referent positive statements. Results of the study indicated that depressed and anxious subjects reported fewer positive and more negative automatic thoughts and had lower

scores on the Self-Presentation Scale than subjects who were not depressed and anxious.

In yet another modification of this idea, Snyder (1989) presented the Hope Scale, where hope is conceived as a "self-enhancing reality negotiation process where the person attempts to increase the linkage to positive acts" (p. 143). The Hope Scale contains two subscales: agency (goal-directed energy) and pathways (planning to meet goals). The correlation between the Hope Scale and the Self-Presentation Scale was observed to be .26, indicating that there is a modest overlap between the two measures. Also reported by Snyder were correlations between the Hope Scale and self-esteem ($r=.56$), enhanced perceptions of problem-solving ability ($r=.51$), trait anxiety ($r=-.46$), and depression ($r=-.34$). Finally, he discussed research linking hope to subsequent higher academic performance in university and greater self-reported psychological health.

Seligman's Attributional Style Questionnaire (see Seligman, 1990), a measure of "learned optimism" versus pessimism, is another candidate for tapping SEI. As a "self-serving illusion", Seligman views the optimism characteristic of normal individuals to be an unrealistic attributional style relative, for example, to the more accurate (and more pessimistic) perceptions of depressed individuals. He has linked such an optimistic explanatory style to increased emotional well-being, better physical health, and higher achievement.

Another potentially suitable measure of this type is Janoff-Bulman's World Assumptions Scale, designed to assess a person's beliefs that (a) the world is benevolent, (b) the world is meaningful, and (c) the self is worthy (Janoff-Bulman, 1989b). These assumptions are associated with an "illusion of invulnerability", the loss of which is viewed as one of the primary effects of victimization (Janoff-Bulman, 1989a).

Specifically:

Nonvictims believe in a benevolent, meaningful universe in which they are worthy, competent individuals who can control what happens to them, and these core beliefs provide them with a sense of relative invulnerability. These are positively biased assumptions--illusions--that make daily life feel relatively safe and secure, even in the midst of ontological chaos. (Janoff-Bulman, 1992, p.147).

Finally, Wink (1992) reported the development of another measure of healthy narcissism, based on a factor analysis of the California Q-set. Dysfunctional narcissism is measured by CAQ Wilfulness (reflecting self-indulgence, condescension, manipulativeness, impulsivity, self-dramatization, and tendencies to eroticize situations) and CAQ Hypersensitivity (reflecting sensitivity to demands and criticism, self-defensiveness, hostility and irritability, and concern with one's own adequacy). In contrast, healthy narcissism is measured by CAQ Autonomy (reflecting independence, high aspirations, unusual thought processes, and breadth of aesthetic and intellectual interests).

In summary, a number of self-report instruments designed to measure non-veridical beliefs about the self show correlations

with indicators of healthy psychological functioning. These correlations are consistent across several different instruments and have been identified by numerous researchers, including many who were not looking for the effect. The argument given in this paper is that these results support a proposition that self-enhancing illusions are associated with mental health. The purpose of this study is to move towards a test of whether this association is in fact causal.

Conceptual bridges for self-enhancing illusions.

Recently, some other researchers have begun to make connections between the three literatures reviewed in this paper. For example, Watson, Sawrie, and Biderman (1991) investigated the relationship between the healthy narcissism factors of NPI and measures of unrealistic schemata from the social cognition literature, in this case Berrenberg's (1987) Belief in Personal Control Scale (particularly the Exaggerated Internal Control factor, described as an indicator of zealous, overstriving, assertive optimism) and Janoff-Bulman's (1989) World Assumptions Scale. The pattern of intercorrelations between these measures was interpreted as evidence of a common dimension of adaptive self-functioning linking adaptive narcissistic functioning and beneficial illusions.

Similarly, Johns and Robins (1994) examined the relationship between self-enhancement and narcissism. Self-ratings by subjects of their performances on a managerial group-discussion

task were compared to composite criteria defined by several peer and expert raters. Results showed that unrealistically positive self-perceptions correlated .32 with NPI scores. The self-enhancement bias was concluded to be an individual difference variable (on a continuum with a self-diminishment bias) more characteristic of individuals higher in narcissism. Likewise, Matheny (1991) found that narcissistic subjects were higher in self-esteem and that they appeared to use inflated (i.e., self-deceptive) estimates of their performance on a non-verbal cognitive task to regulate this self-image when experiencing stress (i.e., failure feedback).

In addition, Raskin, Novacek, and Hogan (1991a), in a study of narcissism, defensive self-enhancement, and self-esteem, made a link between the narcissism and socially desirable responding literatures. Averaged across four samples and employing multiple measures, they obtained correlations between a component of defensive self-enhancement labelled grandiosity¹¹ (marked in part by the ESDS) and narcissism (marked by the NPI) ($r=.52$) and between grandiosity and self-esteem ($r=.51$). Some of the "healthy" subscales of the NPI were also significantly correlated with self-esteem, although grandiose and socially desirable self-

¹¹. A principal components analysis of several defensive self-enhancement measures extracted two components, labelled social desirability and grandiosity. Notably, these components mirror the impression management and self-deceptive enhancement scales, respectively, of the BIDR (Paulhus, 1989).

enhancement were partialled out¹². In conclusion, grandiose self-conceptualization was interpreted as a mechanism involved in narcissistic self-esteem regulation.

In a follow up study, Raskin, Novacek, and Hogan (1991b) evaluated the relationship between self-esteem, narcissism, grandiosity, hostility, and dominance. Converging correlations between hostility, grandiosity, dominance, and narcissism suggested common construct variance, which in turn was correlated to self-esteem over three samples of undergraduates (correlation coefficients ranging from .48 to .51).

No studies making the three-way bridge between the socially desirable responding, social-cognition, and narcissism literatures are known and it is likely that the present study is the first to make such an integration.

Longitudinal Research.

Most of the research reviewed so far has been cross-sectional, meaning that any observed relationships between measured variables are limited to a single point of time. Longitudinal research examines relationships between variables over time, which brings the researcher one step closer towards the goal of inferring causal relationships between variables. Some recent studies with longitudinal designs relating to self-

¹². Based on this use of partial correlations and on comments about grandiosity as a form of "response distortion", Raskin et al. appear to be somewhat ambivalent about their position on the substance versus style debate.

enhancing illusions will be reviewed.

In a study examining motivational hypotheses for depressive realism and nondepressive illusions of control, Koenig, Clements, and Alloy (1992) observed a small but significant relationship between illusion of control and self-esteem (R-squared change=.01, $F=4.21$, $p<.04$; partial correlation=-.17, controlling for initial self-esteem). One explanation offered for the small size of this effect was due to the brief time lag (15-20 minutes) between pre- and post-task measures of self-esteem, a variable that is expected to be relatively stable across a brief interval of time.

In a related but more definitive longitudinal study, Alloy and Clements (1992) examined whether individual differences in illusion of control predicted vulnerability to depression following manipulated and natural stressors. Results indicated that greater illusion of control was associated with (a) less negative mood after a laboratory stressor (failure on unsolvable block designs); (b) less discouragement after subsequent naturally occurring life stressors; and (c) less depression one month later, given a high number of negative life events over the month. In particular, the stress-moderating effect of illusion of control on later depression appeared to be due to a reduction in the discouragement that follows negative life events. In other words, the salutary effects of illusion of control were activated in response to stress. This study was described by the

authors as the first prospective, longitudinal study of the adaptive, health-promoting value of optimistic illusions.

From a similar perspective of stress-activated resistance factors, Holahan and Moos (1990) observed that social and personal resources influenced improved functioning over the course of one year. This influence was direct under a condition of low stress and indirect (via increases in approach-style coping) under a condition of high stress. Personal resources, in this case, included measures of self-confidence and easy-going disposition, which the authors later interpreted as "positive self-referent thoughts"¹³ in the tradition of Taylor and Brown (1988). Interestingly, the role of these personality dispositions, in terms of promoting health maintenance versus health improvement, again depended on an interaction with life stressors.

Again from the perspective of Taylor and Brown (1988), Aspinwall and Taylor (1992) studied optimism, psychological control, and self-esteem¹⁴ as predictors of adjustment to

¹³. Although positive self-referent thoughts are not necessarily as nonveridical as self-enhancing illusions, Holahan and Moos (1990) is included in this review because it is one of the few studies in the literature to investigate the longitudinal relationship between self-referent beliefs and healthy functioning.

¹⁴. Optimism was measured by the Life Orientation Test, self-esteem by the Rosenberg Self-Esteem Scale, and control by Rotter's Locus of Control Scale and Burger's Desire for Control Scale. Unfortunately, it is not clear that these measures tap "illusory" beliefs, let alone self-enhancing illusions. They probably do measure "positive" schemas about self-worth, self-efficacy, and the future, however, which might be related to SEI.

college, at intervals of three months and two years. Controlling for initial positive and negative mood, they observed that the beneficial effects of optimism, control, and self-esteem on adjustment were mediated by nonuse of avoidance coping, greater use of active coping, and greater seeking of social support. Furthermore, self-esteem and control predicted greater motivation and higher grades at the two-year follow-up. What is especially valuable about this study is that it provides some information on the factors that might mediate between dispositional self-cognitions and positive outcomes, such as coping style, support seeking, and motivation.

Purpose of the present study.

In conclusion, there is considerable evidence that a relationship exists between self-enhancing illusions (SEI) and positive outcomes, such as mental health, better coping, and achievement. Two major empirical problems exist in this area, however.

First, the construct of SEI is only vaguely defined, largely because it is poorly understood. At the level of research methodology, this is because most of the self-report measures that likely tap SEI were developed to measure something else, such as socially desirable responding or narcissism. At the level of theoretical psychology, this lack of understanding is because the construct of SEI is inconsistent with the general philosophical view in psychology that veridical self-perception

is at the core of adaptive success.

Second, correlation does not constitute sufficient evidence of causality and, apart from some preliminary investigations, virtually all of empirical studies of SEI have been correlational cross-sectional designs. The purpose of the present study, therefore, is to define the construct of SEI more clearly and to move one step closer towards determining if there is a causal basis to this association between SEI and positive outcomes by using a longitudinal design.

To preface the present study, a self-report method of determining SEI was developed, based on measures drawn from the socially desirable responding, social cognition, and narcissism literatures. These different measures were statistically integrated into a latent construct, using latent variable structural equation modelling (LVSEM), and incorporated into a prospective longitudinal model of the relationship between SEI and psychological disturbance. The mutual across-time relationships between SEI and psychological disturbance were then determined using a panel design, over a 10 week interval.

Panel studies involve measuring at least two variables at one time and then measuring them both again on at least one more occasion (see Biddle, Slavings, & Anderson, 1985; Kenny, 1975). Basically, the object of the design is to see if changes in one variable precede or follow changes in the other variable. If one variable at Time One does appear to have precedence in predicting

changes in another variable at Time Two and if there is a plausible causal theory linking the two variables (see Heise, 1975), then this result may be interpreted as evidence of a causal relationship between the two variables. In this case, measures of self-enhancing illusions and psychopathology symptoms at Time One are followed by repeated measures of these variables at Time Two.

Traditionally, cross-lagged panel correlation analysis (Kenny, 1975) has been used to analyze panel studies. However, because of the development of causal modelling techniques, including those which model latent variables (Bentler, 1985; Joreskog & Sorbom, 1978), new opportunities for assessing causal effects in panel research have emerged. Numerous advantages are available with this form of analysis of cross-lagged panel data (see Bentler & Speckart, 1981).

For example, modelling latent variables means that some of the problems associated with measuring manifest variables are avoided. Rather than rely on a single measure of some construct, the researcher may use two or three manifest measures to achieve an error-controlled measure of the underlying latent construct. Another advantage is that goodness-of-fit statistics are available which may be used to assess model fit and to compare competing models (see Biddle, Slavings, & Anderson, 1985, for a discussion of potential problems). Finally, because association and temporality can be demonstrated, panel studies are the

closest researchers can get to demonstrating causal inference without using controlled experiments.

Two qualifications should be noted at the outset, however. First, the ideal study would empirically determine the veridicality of a person's self-knowledge by comparing his or her self-report to some objective criteria. Second, the ideal study would also experimentally manipulate SEI in some manner in order to determine its causal influence on outcome variables. Due to the complexity of those procedures, however, neither were used in this study.

Instead, a different strategy was adopted which still allowed for an empirical exploration of self-enhancing illusions but under conditions that were simpler and quicker to execute. An operationalization of SEI is developed based on rational grounds and on the advantage of multiple measures. Each measure used to determine SEI was constructed to assess some aspect of non-veridical self-knowledge; in this case, self-deceptive socially desirable responding, biased self-other comparisons, and narcissistic self-inflation. By detecting the common variance marked by these independently developed measures using LVSEM technology, it is proposed that a valid self-report indicator of general SEI is achieved. Moreover, the longitudinal cross-lagged design of the study means that a relationship between SEI and psychological distress may be tested that, if not strictly causal, at least makes the inference of causality more probable.

The assumption here is that the effort and expense of developing more experimental procedures would be more justifiable if the present study is successful. In short, a confirming result here would be a necessary, but not a sufficient condition, for inferring a causal relationship between SEI and mental health.

Two of the measures selected to construct the SEI latent variable were developed by other researchers: namely, Raskin and Hall's (1979) Narcissistic Personality Inventory (NPI) and Paulhus's (1989) Balanced Inventory of Desirable Responding (BIDR-6). Both instruments were designed to measure dispositional unrealistically-biased self-aggrandizement and both have shown previous associations with indicators of mental health. Because no similarly appropriate self-report instrument has been developed in the social cognition literature, a new instrument was written for this study, based on the methodology used in studies of self-other rating bias (see Baumgardner, 1990; Pelham & Swann, 1989). In this case, self-other comparisons are based on adjectives rated on 10-point percentile-type response scales. The logic of the instrument is that anyone producing a pattern of above-average ratings (e.g., more intelligent than 75% of his or her peers) is exhibiting self-enhancing illusions.

Hypotheses

(1) A negative covariation between self-enhancing illusions and generalized emotional distress will be observed.

(2) Self-enhancing illusions will be associated with later decreases in generalized emotional distress.

(3) Generalized emotional distress will not be associated with later changes in self-enhancing illusions.

Method

Subjects

Subjects were recruited from the undergraduate psychology subject pool of the University of Manitoba. Participation was in exchange for course credit. The first phase of data collection involved 340 subjects. Of this group, 291 subjects (104 males and 187 females; mean age=20.8 years, standard deviation=3.7) also participated in the second phase of data collection¹⁵. All analyses were conducted on the 291 subjects who participated in both phases.

Measures

Balanced Inventory of Desirable Responding-6. As discussed earlier, self-enhancing illusion (SEI) was operationalized by three measurement instruments. First, the Balanced Inventory of Desirable Responding (BIDR-6; Paulhus, 1989). The BIDR-6 is a 40-item scale, with 20 items per subscale and which is balanced for affirmation and denial items. Respondents rate each item on a 7-point scale, with the scale anchors ranging from "not at all" to "very much" applicable to them. In particular, the Self-Deceptive Enhancement (SDE) subscale of the BIDR-6 was utilized as an indicator or manifest variable of SEI. The other subscale, Impression Management (IM), was included in the final questionnaire but was not used as an indicator of SEI.

¹⁵. One person in phase II did not participate in phase I and her data was not included in any analysis.

Paulhus (1989) reported norms for the BIDR-6. For the SDE subscale, means were 86.7 ($SD=12.4$) and 85.6 ($SD=12.5$) for 97 male and 165 female undergraduates, respectively. For the IM subscale, means were 67.8 ($SD=17.3$) and 74.8 ($SD=16.2$) for males and females, respectively. Coefficient alphas of .70 and .80 for the SDE and .80 and .86 for the IM scale, for males and females respectively, were reported from the same study. Alphas for the full scale were .83 and .85. Finally, from another study conducted on 83 students, Paulhus reported five-week test-retest correlations of .69 and .65 for the SDE and IM scales, respectively.

The SDE scale includes such items as "My solutions to problems are original and effective" (scored positive) and "When my emotions are aroused, it biases my thinking" (scored negative). An examination of all 20 items suggests that high-scorers are describing themselves as exceptionally capable, insightful, decisive, confident, and unique. These attributes are consistent with self-enhancing self-reporting.

Narcissistic Personality Inventory. The second SEI instrument was the forced-choice 40-item short form of Raskin and Hall's (1979) Narcissistic Personality Inventory. The 40-item form has been observed to correlate .98 with the original 54-item scale. Of the various factored scales of the NPI, items from Raskin and Terry's (1988) Authority, Self-sufficiency, and Superiority factors are the most likely indicators of adaptive or

"healthy" narcissism and are, therefore, potential markers of SEI. Items from the other NPI factors of Exhibitionism, Exploitativeness, and Entitlement are less likely to mark SEI.

Norms for the NPI from a sample of 1018 college students are reported by Raskin and Terry (1988). For the full scale, $M=15.55$, $SD=6.66$, and $\alpha=.83$. Norms specific to healthy narcissism are as follows: Authority ($M=4.16$, $SD=2.17$, & $\alpha=.73$), Superiority ($M=2.54$, $SD=1.36$, & $\alpha=.54$), and Self-Sufficiency ($M=2.09$, $SD=1.50$, & $\alpha=.50$). The NPI has also demonstrated a split-half reliability of .80 (Raskin & Hall, 1979) and an alternate form eight-week test-retest reliability coefficient of .72 (Raskin & Hall, 1981).

An examination of the items in these factor scales suggested that high-scorers are representing themselves as powerful and confident on the Authority scale (e.g., I am a born leader), as special and worthy on the Superiority scale (e.g., I am an extraordinary person), and as autonomous and efficacious on the Self-Sufficiency scale (e.g., I always know what I am doing). The trend of this adaptive form of narcissism is towards self-reported dominance over others, which is consistent with self-enhancing illusions. In contrast, the other NPI factors suggest aggressive domination of others (i.e., Entitlement and Exploitation) and superficial attention-seeking (i.e., Exhibitionism).

Self-Other Comparison Questionnaire. The third and final

SEI indicator, named the Self-Other Comparison Questionnaire (SOCQ), was written for this study. The construction of the SOCQ involved an adaptation of Alicke's (1985) self-other rating procedure. Alicke had designed his items along dimensions of desirability (e.g., intelligent versus irrational) and control (e.g., persistent versus creative). For the purposes of this study, it is the desirability dimension that is of greatest interest, because it is only along that dimension that self-enhancement could occur. Equal numbers of items from the high and low control categories were, however, selected when constructing the SOCQ in order to ensure that different ratios of "controllability" for high and low desirability items did not somehow bias the instrument.

Subjects were asked to rate themselves relative to the "typical university student" on a set of 20 trait adjectives. Five traits were selected from Alicke's list of high desirability/high control adjectives (e.g., self-disciplined), five from the high desirability/low control list (e.g., perceptive), five from the low desirability/high control list (e.g., phoney), and five from the low desirability/low control list (e.g., insecure). Subjects responded on a percentile-type 10-point scale. For example, subjects who judged themselves to be highly intelligent relative to the typical university student would select a response well above 50th percentile.

Symptom Check List 90- Revised. The other main instrument

used in the questionnaire was the Symptom Check List 90 - Revised (SCL-90-R) (Derogatis, 1983), a 90-item self-report measure of recent psychological disturbance symptoms. Subjects respond to items (e.g., "Worrying too much about things") on a 5-point scale ranging from "not at all" to "extremely" distressed by the symptom over the past 7 days.

The SCL-90-R has nine symptom dimensions: Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Anger-Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism. However, although these dimensions do suggest the classes of symptoms tapped by the SCL-90-R, factor analytic studies suggest that it is primarily a measure of general symptomatic distress (Brophy, Norvell, & Kiluk, 1988; Cyr, McKenna-Foley, & Peacock, 1985; Mazmanian et al., 1987; Strauman & Wetzler, 1992). Overall symptom distress is defined by the Global Severity Index (GSI): SCL-90-R grand total divided by 90.

The following is a list of norms for the nine subscales from a sample of 974 nonpatients reported by Derogatis (1983): Somatization (items=12, $M=.36$, $SD=.42$), Obsessive-Compulsive (items=10, $M=.39$, $SD=.45$), Interpersonal Sensitivity (items=9, $M=.29$, $SD=.39$), Depression (items=13, $M=.36$, $SD=.44$), Anxiety (items=10, $M=.30$, $SD=.37$), Anger-Hostility (items=6, $M=.30$, $SD=.40$), Phobic Anxiety (items=7, $M=.13$, $SD=.31$), Paranoid Ideation (items=6, $M=.34$, $SD=.44$), and Psychoticism (items=10, $M=.14$, $SD=.25$). The norms from this sample for the overall GSI

are $M=.31$ and $SD=.31$.

Internal consistencies (alpha) for the nine subscales range from .77 (Psychoticism) to .90 (Depression). Test-retest coefficients (one-week) range from .78 (Anger-Hostility) to .90 (Phobic Anxiety).

The SCL-90-R has a number of advantages. First, it is a fairly quick measure of a substantial range of recent psychological distress symptoms. Second, it has already shown some association with non-veridical self-presentation, consistent with self-enhancing illusions. For example, Mazmanian et al. (1987) observed that correlations between the nine symptom dimensions of the SCL-90 and Jackson's PRF-D (desirability response style) scale averaged $-.52$. Similarly, correlations between the nine symptom dimensions of the SCL-90-R and the MMPI K scale have been shown to average $-.39$ (Brophy, Norvell, & Kiluk, 1988).

In summary, these four instruments (BIDR-6, NPI, SOCQ, and SCL-90-R) were combined into a single questionnaire booklet (see Appendix 1). Six different orders of arrangement were used in total, three different orders at Time One and three new different orders at Time Two.

Procedure

Subjects were run in a large classroom in groups of approximately fifty individuals. The same setting was used for both phases. At the end of the first session, partial research

credit was given and subjects were given an appointment for Time Two, to be run ten weeks later. A few days prior to this second phase, subjects were visited in their classrooms, given a reminder about the study, and provided with optional alternative participation times. Subjects completed the same questionnaire at Time Two, although the individual instruments were sorted in a different order in the booklet.

On the cover sheet of the questionnaire at Time One was a section for the subject to create a unique identification code that would link data with the next phase. This code was comprised of (a) the first letter of the subject's first name, (b) the first three letters of his or her mother's maiden name, (c) the subject's gender, and (d) the subject's date of birth. This produced an 11-digit identification code that was unique for each subject, yet assured relative anonymity. An identical procedure was used to generate the identification code at Time Two. In this manner, data was linked for all subjects participating in both phases.

Results

The following analyses were conducted using SAS release 6.07 (see SAS Institute, 1985). Summary statistics for the primary variables are displayed in Table 1. Indices of skewness and kurtosis are generally consistent with univariate normality, indicating that data transformation procedures to improve the distributional characteristics of individual variables appear to be unnecessary.

Means for the NPI are within one standard deviation of the norms for undergraduates reported by Raskin and Terry (1988). The means for the BIDR-6 are also within one standard deviation of the norms for undergraduates reported by Paulhus (1989). Because the SOCQ was developed for this research, no comparison to previous data is possible for that measure.

The means for the SEI indicators (BIDR-6, NPI, and SOCQ) are also consistent with the prediction that undergraduates will tend to exhibit self-enhancing illusions. For example, the average response on the Self-Deceptive Enhancement subscale of the BIDR was 4.1 on the 7-point scale¹⁶. This score means that most

¹⁶. Paulhus has recommended that an extreme scoring format be used with the BIDR (i.e., scores of "6" and "7" on affirmation items and scores of "1" and "2" on denial items are coded as positive for SDR). The logic of this approach is that socially desirable responding is a form of extreme or "biased" self-reporting. However, preliminary analyses indicated that scores on this measure are distributed continuously and relatively normally (with a general trend for a self-enhancing skew) so that dichotomization resulted in some lost information (i.e., attenuated correlations). For instance, there is likely a substantial difference between a "5" and a "1" response on the item "I am a

Table 1

Summary Statistics for Primary Variables

Variable Subscale	M	SD	Skewness	Kurtosis	Cronbach Alpha
<u>Balanced Inventory of Desirable Responding (BIDR-6)</u>					
<u>Self-Deceptive Enhancement</u>					
Time One	83.60	12.37	-0.01	0.12	.70
Time Two	80.08	10.83	0.38	0.12	.70
<u>Impression Management</u>					
Time One	76.00	15.22	0.11	0.64	.76
Time Two	74.11	15.35	0.20	1.16	.80
<u>Narcissistic Personality Inventory (NPI)</u>					
Time One	13.47	6.84	0.58	-0.31	.85
Time Two	13.64	7.64	0.73	-0.05	.88
<u>Self-Other Comparison Questionnaire (SOCQ)</u>					
<u>High Desirability</u>					
Time One	635.69	97.93	0.13	0.10	.80
Time Two	651.77	96.06	0.24	-0.39	.82
<u>Low Desirability</u>					
Time One	655.58	115.09	0.30	-0.04	.76
Time Two	653.19	110.11	0.32	0.32	.77
<u>Symptom Checklist-90-Revised (SCL-90-R)</u>					
Time One	0.85	0.54	0.95	0.65	.97
Time Two	0.86	0.55	0.64	-0.34	.97

Note. N=291.

Note. Missing values for individual items have been replaced with item means, rounded to the nearest whole number.

Note. SDE (denial) and SOCQ (low-desirability) items are reverse scored.

Note. SCL-90-R is reported as the Global Severity Index, the grand total divided by 90.

completely rational person", a difference which is lost by dichotomous scoring.

subjects "moderately" agreed with those items. Similarly, subjects endorsed an average of 40% of the forced-choice items on the NPI subscales usually associated with "healthy narcissism" (Authority, Self-Sufficiency, and Superiority). Finally, on the Self-Other Comparison Questionnaire, the overall average response was 65, meaning that subjects generally considered themselves to be at the 65th percentile relative to their peers on attractive traits and at the 35th percentile on unattractive traits. Therefore, a moderate level of self-enhancing illusions appears to be normal for university undergraduates.

Interestingly, the means obtained for the SCL-90-R Global Severity Index exceed one standard deviation of the norm for nonpatients reported in the SCL-90-R manual (Derogatis, 1983). This suggests that distress due to psychopathology symptoms may be somewhat more common for young adults enrolled in university study than it is for the population as a whole. Whether this result can be attributed to age differences or to environmental demands is unknown. It should be noted, however, that this still only means that the average response for this sample of undergraduates was .85 on the 5-point (0 to 4) response scale, meaning that most subjects were less than "a little bit" distressed by psychopathology symptoms.

To explore these issues further, the summary statistics for individual SCL-90-R subscales are displayed in Table 2. Several of the subscales exhibit moderate to high degrees of skewness and

Table 2

Summary Statistics for SCL-90-R Variables

Variable	<u>M</u>	<u>SD</u>	Skewness	Kurtosis
TIME 1				
Somatization	9.770	7.342	1.077	0.723
Obsessive-Compulsive	11.223	7.025	0.644	-0.030
Interpersonal Sensitivity	9.722	6.871	0.798	0.173
Depression	13.581	9.233	0.804	0.049
Anxiety	7.309	6.399	1.393	2.415
Anger-Hostility	5.082	4.649	1.535	2.342
Phobic Anxiety	2.199	3.200	2.359	6.451
Paranoid Ideation	5.120	4.248	0.918	0.477
Psychoticism	5.849	5.988	1.584	2.837
TIME 2				
Somatization	10.038	7.571	0.910	0.275
Obsessive-Compulsive	11.117	6.994	0.481	-0.354
Interpersonal Sensitivity	9.677	6.800	0.642	-0.223
Depression	13.935	9.500	0.690	-0.195
Anxiety	7.529	6.395	1.095	1.167
Anger-Hostility	5.392	4.876	1.357	1.646
Phobic Anxiety	2.313	3.261	1.688	2.517
Paranoid Ideation	5.082	4.402	0.941	0.253
Psychoticism	5.608	5.916	1.221	0.874

Note. N=291.

Note. Missing values for individual items have been replaced with item means, rounded to the nearest whole number.

kurtosis. These results are generally consistent with expectations: most university undergraduates report relatively little distress due to psychopathology symptoms whereas a small subgroup, who experience symptoms, find their symptoms to be relatively distressing, which produces positively skewed and platykurtic distributions. This seems to be especially true for symptomatically distinct pathologic disorders, such as with Phobic Anxiety or Psychoticism. Distributions for Depression and Interpersonal Sensitivity are more normal, suggesting that distress due to these symptoms is generally more common for undergraduates. Interestingly, distress due to Obsessive-Compulsive symptoms also appears to be more "normal" for undergraduates, possibly related to the cognitive demands of being a student.

In order to test for possible attrition effects, t -tests contrasting those subjects who participated in both phases ($N=291$) with those who participated only in the first phase ($N=49$) were performed on the Time One measures (see Appendix 2). Only one of these four differences was significant: NPI scores of the drop-outs were higher than NPI scores for those subjects participating in both phases. One possible explanation is that more narcissistic subjects may be less compliant with the researcher's request for participation in both phases of the study. It also suggests that the overall sample utilized in the longitudinal analysis was less narcissistic than average.

Whether this attenuated any of the results is unknown.

Similarly, univariate F statistics were calculated across six questionnaire arrangements (three per phase) in order to test for possible order effects (see Appendix 3). None of these differences were significant, except for the NPI measure at Time One. This is an unexpected result and is difficult to explain. The fact that a corresponding order effect was not found for the NPI in the Time Two sample suggests that the Time One finding may be aberrant.

Finally, sex differences were examined by performing t -tests on the primary variables (see Appendix 4). Males tended to score higher than females on the NPI and SOCQ at both Time One and at Time Two. The reverse pattern was observed for the BIDR. This inconsistency is due to the Impression Management subscale of the BIDR. When only the Self-Deceptive Enhancement subscale is examined for sex differences the opposite trend occurs. A possible explanation for this is that, as discussed earlier, the SDE subscale has more in common with the NPI and the SOCQ. If sex differences were to exist for self-enhancing illusions then it would be expected that males would show more self-aggrandizement than females. In contrast, the IM subscale may be capturing attitudes towards social compliance. Perhaps this trait is more typical for women, hence the opposite sex difference for the total BIDR observed here. Similarly, females tended to score higher than males on the SCL-90-R, although in

this case these differences did not reach statistical significance.

Based upon these results, it would be ideal if subsequent structural modelling analyses could examine males and females separately. Given that LVSEM analyses generally require larger sample sizes, however, it was judged to be more advantageous to combine males and females into a single sample.

Confirmatory factor analyses

The value of a latent variable structural equation model depends on the quality of the underlying measured variables. For this reason, factor analytic procedures were used to refine the subscales of each of the primary measures in the study. The standard procedure was to conduct separate item-level exploratory factor analyses on each measure of the Time One sample. These results were then used as the basis for designing confirmatory factor analyses on the Time Two sample that would define the final subscales (measured variables) that would be used in the latent variable causal model¹⁷. Confirmatory factor analyses were conducted using EQS (Bentler, 1985). The analyses for each measure are discussed below.

Narcissistic Personality Inventory. A principal factor analysis was run on the items of the NPI (Time One sample).

¹⁷. The standard procedure for these confirmatory factor analyses was to set the path of one item for each factor at 1.0 in order to define that factor and to allow factors to covary (i.e., oblique factor structures were allowed).

Based on minimum eigenvalue criteria and on a scree test of the eigenvalues, three factors were rotated by the promax procedure. These factors accounted for 72% of the total variance. The top loading items from the factor pattern (standardized regression coefficients) are presented in Table 3 (.30 cut-off criterion).

The first factor was primarily comprised of items from the Authority subscale, plus some items from the Self-Sufficiency subscale¹⁸. These items refer to a desire to assume a leadership role and a self-confident belief in personal abilities. The second factor was comprised of items from the Vanity, Superiority, and Exhibitionism subscales. Most of these items refer to self-admiration, especially due to perceived physical attractiveness. The third factor contained items from the Entitlement, Exhibitionism, and Exploitativeness subscales and one Authority item. These items refer to a sense of entitlement and a drive for dominance over others. These three factors are similar to the results of other factor analyses of the NPI in earlier research (Emmons, 1984; 1987). Of the present set, the first two factors contained a majority of items associated with "healthy narcissism".

Results from this exploratory factor analysis on the Time One sample were then used as the basis for a confirmatory factor analysis (EQS) of the NPI items for the Time Two sample. A

¹⁸. To avoid confusion, labels are given only for the subsequent "confirmed" factors.

Table 3

Exploratory Factor Analysis of NPI on Time One Sample

Factor			
Load ^a	No.	Variable	Subscale ^b
I		(eigenvalue=5.79)	
.61	10.	I see myself as a good leader.	Auth
.53	11.	I am assertive.	Auth
.48	32.	People always seem to recognize my authority.	Auth
.48	33.	I would prefer to be a leader.	Auth
.45	36.	I am a born leader.	Auth
.39	17.	I like to take responsibility for making decisions.	SS
.38	21.	I always know what I am doing.	SS
.36	27.	I have a strong will to power.	Entl
.35	22.	I rarely depend on anyone else to get things done.	SS
.34	1.	I have a natural talent for influencing people.	Auth
II		(eigenvalue=1.47)	
.65	19.	I like to look at my body.	Van
.60	29.	I like to look at myself in the mirror.	Van
.53	9.	I think I am a special person.	Sup
.49	15.	I like to show off my body.	Van
.47	30.	I really like to be the center of attention.	Exhi
.44	7.	I like to be the center of attention.	Exhi
.43	40.	I am an extraordinary person.	Sup
.32	20.	I will usually show off if I get the chance.	Exhi
III		(eigenvalue=1.30)	
.51	25.	I will never be satisfied until I get what I deser	Entl
.47	24.	I expect a great deal from other people.	Entl
.42	38.	I get upset when people don't notice how I look	Exhi
.42	13.	I find it easy to manipulate people.	Expl
.41	27.	I have a strong will to power.	Entl
.41	14.	I insist upon getting the respect that is due me.	Entl
.37	7.	I like to be the center of attention.	Exhi
.36	12.	I like having authority over other people.	Auth
.34	20.	I will usually show off if I get the chance.	Exhi
.30	6.	I can usually talk my way out of anything.	Expl

^aStandardized Regression Coefficients.^bAuth=Authority, SS=Self-Sufficiency, Sup=Superiority, Van=Vanity, Exhi=Exhibitionism, Entl=Entitlement, Expl=Exploitativeness.

Continued on next page.

Table 3 (continued)

Factor Analysis of NPI on Time One Sample: Interfactor Correlations.

	Factor I	Factor II	Factor III
Factor I	1.00		
Factor II	0.38	1.00	
Factor III	0.33	0.42	1.00

Note. Principal factor analysis with promax rotation.

Note. N=340.

three-factor model was designed, with each factor comprised of all of the items from the subscales that contributed items in the initial exploratory factor analysis. Factor One was composed of the items from the Authority and Self-Sufficiency subscales; Factor Two was composed of the items from the Vanity, Superiority, and Exhibitionism subscales; and Factor Three was composed of the items from the Entitlement, Exploitativeness, and Exhibitionism subscales (the Authority subscale was excluded as only a single item appeared on the third factor in the exploratory factor analysis).

The maximum likelihood solution produced a relatively poor overall model: chi-square of 1371.66 ($df=730$, $N=291$), $p<.001$, with a comparative fit index of .74. Note, however, that the objective of this confirmatory analysis was not to find a good fitting model but to determine which items were retained on each factor. This analysis may be more properly understood as a confined exploratory analysis for the purpose of scale development.

Results from the standardized solution are presented in Table 4. On Factor One, seven of the eight items of the Authority subscale were retained (six of which had appeared on the first factor in the exploratory factor analysis) and all items of the Self-Sufficiency subscale are dropped (.40 cut-off criterion). The correlation between the sum of these seven items and the original Authority scale was 0.98. The meaning of this

Table 4

Confirmatory Factor Analysis of NPI on Time Two Sample

Factor

Load ^a	No.	Variable	Subscale ^b
I		<u>Leadership/Authority</u> (variance=.107, SE=.018, test stat=5.85)	
.74	33.	I would prefer to be a leader.	Auth
.65	10.	I see myself as a good leader.	Auth
.64	12.	I like having authority over other people.	Auth
.59	32.	People always seem to recognize my authority.	Auth
.58	36.	I am a born leader.	Auth
.54	11.	I am assertive.	Auth
.47	1.	I have a natural talent for influencing people.	Auth
II		<u>Vanity/Self Admiration</u> (variance=.080, SE=.015, test stat=5.35)	
.66	15.	I like to show off my body.	Van
.63	19.	I like to look at my body.	Van
.56	29.	I like to look at myself in the mirror.	Van
.49	9.	I think I am a special person.	Sup
.47	40.	I am an extraordinary person.	Sup
.46	20.	I will usually show off if I get the chance.	Exhi
.44	26.	I like to be complimented.	Sup
III		<u>Entitlement/Arrogance</u> (variance=.028, SE=.008, test stat=3.69)	
.58	5.	If I ruled the world it would be a better place.	Entl
.54	13.	I find it easy to manipulate people.	Expl
.54	27.	I have a strong will to power.	Entl
.46	30.	I really like to be the center of attention.	Exhi
.46	6.	I can usually talk my way out of anything.	Expl
.45	25.	I will never be satisfied until I get what I deserve.	Entl
.44	35.	I can make anybody believe anything I want them to.	Expl
.43	7.	I like to be the center of attention.	Exhi
.42	3.	I would do almost anything on a dare.	Exhi
.42	18.	I want to amount to something in the eyes of the world.	Entl

^aStandardized Solution.^bAuth=Authority, SS=Self-Sufficiency, Sup=Superiority, Van=Vanity, Exhi=Exhibitionism, Entl=Entitlement, Expl=Exploitativeness.

Continued on next page.

Table 4 (continued)

CFA of NPI on Time Two Sample: Interfactor correlations

	Factor I	Factor II	Factor III
Factor I	1.00		
Factor II	0.565	1.00	
Factor III	0.755	0.571	1.00

Note. Maximum Likelihood Solution (EQS)

Note. N=291.

factor is therefore fairly clear and this result is consistent with earlier research.

On Factor Two of the confirmatory analysis, a variety of Vanity, Superiority, and Exhibitionism items were retained. Five of these seven items also appeared on the second factor in the exploratory factor analysis, so the meaning of the confirmed factor would be quite similar to what was discussed earlier (i.e., self-admiration, especially related to physical attractiveness). The sum of the Factor Two items correlated substantially with the original Vanity subscale ($r=0.83$) and Superiority subscale ($r=0.77$).

On Factor Three, a variety of Entitlement, Exploitativeness, and Exhibitionism items were retained. Only five of these ten items appeared on the third factor in the exploratory factor analysis, but the essential meaning of this factor appears to have remained stable. The largest correlations between the sum of these items and the original NPI subscales were as follows: $r=0.75$ for Entitlement, $r=0.73$ for Exploitativeness, and $r=0.72$ for Exhibitionism.

Of these three confirmed NPI factors, the first two were subsequently used as two aspects of "healthy narcissism" for the Self-Enhancing Illusion latent variable in the overall structural model. Accordingly, these two confirmed factors were observed to correlate $r=.57$ with each other, indicating moderate common variance. New scales were created by summing the highest loading

items on each factor (as displayed in Table 4). These abbreviated NPI scales have the advantage of being derived from the present research sample, which should make them more meaningful indicators of what the NPI is measuring in this undergraduate population. Henceforth, these scales will be referred to as Leadership/Authority and Vanity/Self-Admiration, respectively.

Balanced Inventory of Desirable Responding. A principal factor analysis was run on the items of the BIDR (Time One sample). Based on the theoretical expectation that the BIDR is divided into four components (SDE-affirmation, SDE-denial, IM-affirmation, and IM-denial subscales), four factors were chosen for rotation by the promax procedure. These factors accounted for 81% of the total variance. Coincidentally, these four factors also met minimum eigenvalue and scree test criteria for selecting substantive factors. The top loading items from the factor pattern (standardized regression coefficients) are presented in Table 5.

The first factor was comprised of 8 of the 10 denial items from the Self-Deception Enhancement subscale (plus one affirmation item) and 5 of the 10 denial items from the Impression-Management subscale. Items tend to refer to falsity, poor mental control, and harming others. The second factor was comprised of a mix of denial and affirmation items from the Impression-Management subscale. High-scorers on this factor

Table 5
Exploratory Factor Analysis of BIDR on Time One Sample

Factor	Load ^a	No.	Variable	Subscale ^b
(eigenvalue=4.19)				
.53	3.	I have not always been honest with myself.	SDE-	
.52	19.	I don't always know the reasons why I do the things I do.	SDE-	
.48	2.	It would be hard for me to break any of my bad habits.	SDE-	
.46	10.	It's hard for me to shut off a disturbing thought.	SDE-	
.45	26.	I sometimes try to get even rather than forgive and forget.	IM-	
.44	21.	I sometimes tell lies if I have to.	IM-	
.42	24.	There are some occasions when I have taken advantage of someo	IM-	
.42	14.	I rarely appreciate criticism.	SDE-	
.40	27.	I have said something bad about a friend behind his or her ba	IM-	
.39	13.	My parents were not always fair when they punished me.	SDE-	
.36	39.	I have some pretty awful habits.	IM-	
.36	12.	I sometimes lose out on things because I can't make up my min	SDE-	
.35	16.	I have sometimes doubted my ability as a lover.	SDE-	
.39	17.	I am a completely rational person.	SDE+	
(eigenvalue=1.98)				
.48	33.	I sometimes drive faster than the speed limit	IM-	
.47	38.	I have taken sick leave from work or school even though I was	IM-	
.47	28.	I have receive to much change from a salesperson without tell	IM-	
.43	31.	When I was young I sometimes stole things.	IM-	
.31	21.	I sometimes tell lies if I have to.	IM-	
.31	22.	I never cover up my mistakes.	IM+	
.33	35.	I have never read sexy books or magazines.	IM+	
.36	29.	When I hear people talking privately, I avoid listening.	IM+	
.42	30.	I always declare everything at customs.	IM+	
.45	32.	I have never dropped litter on the street.	IM+	
.46	25.	I always obey laws, even if I'm unlikely to get caught.	IM+	
.47	23.	I never swear.	IM+	
(eigenvalue=1.66)				
.50	9.	I am fully in control of my life.	SDE+	
.45	18.	My solutions to problems are original and effective.	SDE+	
.44	8.	Once I've made up my mind, other people can seldom change my	SDE+	
.43	17.	I am a completely rational person.	SDE+	
.39	11.	I never regret my decisions.	SDE+	
.38	7.	I always know why I like things.	SDE+	
.38	4.	I don't care what other people really think of me.	SDE+	
.31	22.	I never cover up my mistakes.	IM+	
(eigenvalue=1.30)				
.64	37.	I have never damaged a library book or store merchandise with	IM+	
.58	36.	I never take things that don't belong to me.	IM+	
.37	34.	I have done things that I don't tell other people about.	IM-	

Standardized Regression Coefficients.

SDE=Self-Deceptive Enhancement; IM=Impression Management.

Continued on next page

Table 5 (continued)

EFA of BIDR on Time One Sample: Interfactor Correlations

	Factor I	Factor II	Factor III	Factor IV
Factor I	1.00			
Factor II	0.32	1.00		
Factor III	-0.16	-0.04	1.00	
Factor IV	0.04	-0.07	-0.02	1.00

Note. Principal factor analysis with promax rotation.

Note. N=340.

would appear to be willing to admit to committing dishonest, immoral, or illegal activities. The third factor was comprised of 7 of the 10 affirmation items from the Self-Deceptive Enhancement subscale. Most items imply self-confidence of thought and action. This factor, in particular, seems to be related to the construct of self-enhancing illusions as discussed earlier. The fourth factor was comprised of a few affirmation and denial items from the Impression-Management subscale. This factor appears to be small and uninteresting.

As with the NPI, the results of an exploratory factor analysis of the BIDR on the Time One sample were used as the basis for a confirmatory factor analysis on the Time Two sample. In this case, however, only items from the Self-Deceptive Enhancement subscale were retained in the model. This would capture a tendency to exaggerate judgements of self-control and internal resources, versus judgements of poor mental control and self-deception. The Impression-Management scale was judged to be less related to the self-enhancing illusion construct, so it was omitted from subsequent analyses. Specifically, Impression-Management seems to involve strong features of appropriate versus inappropriate social behaviour, as opposed to a self-relevant distorted perception. Therefore, a reduced two-factor model was designed, with one factor comprised of the SDE affirmation items and the other comprised of the SDE denial items.

The maximum likelihood solution produced another relatively

poor overall model: chi-square of 342.77 ($df=169$, $N=291$), $p<.001$, with a comparative fit index of .73. The standardized solution is presented in Table 6. On Factor One, five of ten items from the original SDE (affirmation) subscale were retained for refined scale development (.40 cut-off criterion). Presumably, these select items represent the best indicators of the factor underlying this subscale, at least for the present sample of subjects. High scorers on this factor would express considerable confidence in their self-efficacy and rational self-awareness. The correlation between the sum of these five items with the original SDE (affirmation) subscale was $r=0.85$.

Similarly, Factor Two was comprised of five of the ten initial items of the SDE (denial) subscale (reversed). High scorers on the factor would report feelings of self-doubt and poor control of their own minds. The correlation between the sum of these five items and the original SDE (denial) subscale was also quite high at $r=0.86$. Moreover, the moderately substantial inter-factor correlation ($r=.64$) suggests that these two SDE factors might be tapping a common underlying dimension.

As before, these confirmed factors were used to define new scales for use as manifest indicators of the Self-Enhancing Illusions latent variable in the overall structural model. They will be referred to as Self-Deceptive Enhancement (Affirmed) and Self-Deceptive Enhancement (Denied), respectively. In the present case, these refined scales of the BIDR seem to capturing

Table 6

Confirmatory Factor Analysis of BIDR on Time Two Sample

Factor			
Load ^a	No.	Variable	Subscale ^b
I Self-Deceptive Enhancement (Affirmed)			
(variance=.541, <u>SE</u> =.131, test stat=4.13)			
.66	9.	I am fully in control of my life.	SDE+
.58	17.	I am a completely rational person.	SDE+
.53	7.	I always know why I like things.	SDE+
.51	11.	I never regret my decisions.	SDE+
.45	18.	My solutions to problems are original and effective.	SDE+
II Self-Deceptive Enhancement (Denied)			
(variance=.464, <u>SE</u> =.139, test stat=3.33)			
.54	3.	I have not always been honest with myself.	SDE-
.50	20.	It's alright with me if some people happen to dislike me.	SDE-
.45	2.	It would be hard for me to break any of my bad habits.	SDE-
.44	10.	It's hard for to shut off a disturbing thought.	SDE-
.42	12.	I sometimes lose out on things because I can't make up my mind soon enough.	SDE-

^aStandardized Solution.^bSDE=Self-Deceptive Enhancement; IM=Impression Management.Note. Maximum Likelihood Solution (EQS)Note. Interfactor correlation = 0.637 (denial items reversed scored).Note. N=291.

elements of exaggerated (or diminished) perceptions of mental control.

Self-Other Comparison Questionnaire. A principal factor analysis was also run on the items of the SOCQ (Time One sample). Based on the theoretical expectation that the SOCQ is divided into four components (High and Low Desirability crossed with High and Low Control), four factors were retained for rotation by the promax procedure. Of these four factors, only two met minimum eigenvalue and scree test criteria for substantive factors. Together, these first two factors accounted for 88% of the total variance. Top loading items (.30 cut-off criterion) from the factor pattern (standardized regression coefficients) are displayed in Table 7.

The first factor was comprised of 8 of the 10 High-Desirability items of the SOCQ. High-scorers would tend to report that they surpass their peers on a wide variety of positive characterological traits (such as "resourceful" and "perceptive"). The second factor was comprised of four Low-Desirability items and two High-Desirability items. In this case, high-scorers on the factor would show an opposite trend: they would rate themselves relatively higher on some negative traits and relatively lower on some positive traits. Notably, the factor structure (item-factor correlations) indicated that four additional Low-Desirability items had loadings that exceeded .40 on the second factor. Therefore, this exploratory factor

Table 7

Exploratory Factor Analysis of SOCO on Time One Sample

Factor			
Load ^a	No.	Variable	Subscale ^b
I (eigenvalue=4.42)			
.66	15.	Resourceful.	HDHC
.65	8.	Perceptive.	HDLC
.61	9.	Intelligent.	HDLC
.61	1.	Persistent.	HDHC
.58	17.	Creative.	HDLC
.45	4.	Clear-headed	HDLC
.42	19.	Admirable.	HDLC
.31	18.	Self-disciplined.	HDHC
II (eigenvalue=1.57)			
.61	3.	Phony.	LDHC
.55	6.	Cold.	LDHC
.36	2.	Maladjusted.	LDLC
.32	10.	Dishonorable.	LDHC
-.33	12.	Clean.	HDHC
-.56	5.	Sincere.	HDHC

^aStandardized Regression Coefficients.

^bHDHC=High-Desirability/High-Control, HDLC=High-Desirability/Low-Control, LDHC=Low-Desirability/High-Control, LDLC=Low-Desirability/Low-Control.

Note. Principal factor analysis with promax rotation.

Note. Interfactor correlation = -0.31.

Note. N=340.

analysis suggested that the items of the SOCQ were separating into two factors roughly along the desirability dimension.

To some extent, the other dimension (control) also appeared to show a trend to separate between these two factors. Five of the eight items on Factor One were Low-Control type and five of the six items on Factor Two were High-Control type. In the terminology of attribution theory, high scorers on Factor One seem to be indicating superiority over their peers on several positive, internal, and stable personality traits (e.g., being "perceptive"). This is the pattern expected for a self-enhancing cognitive style. In contrast, high scorers on Factor Two seem to be admitting to several negative, internal, and unstable flaws in their behaviour (e.g., being "phony").

In spite of this second trend, however, the desirability dimension still appeared to have greater importance in the definition of factors. High and Low Desirability items always loaded on opposite poles of a factor, whereas some High and Low Control items loaded on the same side of a factor. As a result, the subsequent confirmatory factor analysis of the Time Two sample was based on a two factor model, with items divided according to the High-Low Desirability criterion.

The maximum likelihood solution produced another relatively poor overall model: chi-square of 473.47 ($df=169$, $N=291$), $p<.001$, with a comparative fit index of .80. The standardized solution is presented in Table 8. On the first factor, all ten

Table 8

Confirmatory Factor Analysis of SOCO on Time Two Sample

Factor			
Load ^a	No.	Variable	subscale ^b
I High-Desirability			
(variance=58.472, <u>SE</u> =14.252, test stat=4.10)			
.69	9.	Intelligent.	HDLC
.66	4.	Clear-headed.	HDLC
.64	8.	Perceptive.	HDLC
.63	15.	Resourceful.	HDHC
.61	19.	Admirable.	HDLC
.53	17.	Creative.	HDLC
.50	18.	Self-disciplined.	HDHC
.49	1.	Persistent.	HDHC
.48	5.	Sincere.	HDHC
.44	12.	Clean.	HDHC
II Low-Desirability			
(variance=95.098, <u>SE</u> =21.888, test stat=4.35)			
.70	20.	Incompetent.	LDLC
.64	10.	Dishonorable.	LDHC
.62	11.	Irrational.	LDLC
.58	3.	Phony.	LDHC
.58	13.	Irresponsible	LDHC
.52	2.	Maladjusted.	LDLC

^aStandardized Solution.^bHDHC=High-Desirability/High-Control, HDLC=High-Desirability/Low-Control, LDHC=Low-Desirability/High-Control, LDLC=Low-Desirability/Low-Control.Note. Maximum Likelihood Solution (EQS)Note. Interfactor correlation = 0.572 (reverse scored).Note. N=291.

High-Desirability items were retained (with a .40 cut-off criterion). On the second factor, however, only six of the ten Low-Desirability items (reversed) were retained. Nevertheless, the correlation between the sum of these six items and the original ten Low-Desirability items was still quite high at $r=0.85$. The inter-factor correlation was $r=.57$, which indicated that enough common variance existed to justify using scales derived from both sets of items as two more markers of Self-Enhancing Illusion in the final structural model. Revised SOCQ subscales were defined by summing the top-loading items on each confirmed factor.

Symptom Checklist-90-R. A principal factor analysis was run on the items of the SCL-90-R (Time One sample)¹⁹. Nine factors were selected for rotation by the promax procedure, based on the assumption that the derived factors should tap the nine subscales ordinarily used for this instrument. Notably, the first factor accounted for a significantly greater proportion of this variance when compared to the other factors (47% versus 6% for the next largest factor). This result indicated that the SCL-90-R is a predominantly unidimensional instrument, at least when used on this nonclinical undergraduate sample. Top loading items from

¹⁹. The ratio of variables to subjects (90:291) makes for a rather thin factor analysis. This is not regarded as a serious problem, however, because of the availability of both exploratory and confirmed factor results. Moreover, the factor structure of the SCL-90-R is expected to be quite simple: basically a single large factor, as reviewed earlier. This also means that any random variations in factor structure will have less significance.

the factor pattern (GE .40) of this first factor are presented in Table 9.

Items from a few SCL-90-R subscales load onto this factor, although items from the Depression subscale predominate. When the factor structure is examined, items from a range of subscales show association (based on correlations at or above .40):

Depression (12/12), Interpersonal Sensitivity (7/9), Obsessive-Compulsive (6/10), Anxiety (5/10), Psychoticism (5/10), Anger-Hostility (3/6), Paranoid Ideation (3/6), and Additional (2/7).

High scorers on this factor seem to be endorsing a wide range of symptoms associated with a general state of dysphoria. In this regard, the SCL-90-R appears to be measuring what it was intended to measure in this study.

The subsequent confirmatory factor analysis modelled this single global factor of emotional distress, with all SCL-90-R items allocated to one factor. The maximum likelihood solution produced a poor overall model: chi-square of 10035.55 ($df=3915$, $N=291$), $p<.001$, with a comparative fit index of .58. The top 27 items (loading .60 or greater on the standardized solution) are presented in Table 10. These items were selected for a refined SCL-90-R scale to be used as the single manifest indicator of symptomatic distress in the structural model. The correlation between the sum of these items and the overall SCL-90-R scale was large at $r=0.95$. Notably, 8 of 13 Depression and 6 of 9

Table 9

Exploratory Factor Analysis of SCL-90-R on Time One Sample

Factor			
Load ^a	No.	Variable	Subscale ^b
I		(eigenvalue=26.16)	
.83	30.	Feeling blue.	Dep
.82	29.	Feeling lonely.	Dep
.61	31.	Worrying too much about things.	Dep
.58	77.	Feeling lonely even when you are with people.	Psych
.58	54.	Feeling hopeless about the future.	Dep
.50	26.	Blaming yourself for things.	Dep
.49	79.	Feelings of worthlessness.	Dep
.47	20.	Crying easily.	Dep
.42	41.	Feeling inferior to others.	Dep
.41	3.	Repeated unpleasant thoughts that won't leave your mind.	Obs
.41	34.	Your feelings being easily hurt.	Int
.41	14.	Feeling low in energy or slowed down.	Dep

^aStandardized Regression Coefficients.

^bDep=Depression, Psych=Psychoticism, Obs=Obsessive-Compulsive, Int=Interpersonal Sensitivity.

Note. Principal factor analysis with promax rotation.

Note. N=340.

Table 10

Confirmatory Factor Analysis of SCL-90-R on Time Two Sample

Factor

Load^a No.

Variable

Subscale^b

I Symptomatic Distress

.74	80.	The feeling that something bad is going to happen to you.	ANX
.73	30.	Feeling blue.	DEP
.73	61.	Feeling uneasy when people are watching or talking about you.	INT
.72	77.	Feeling lonely even when you are with people.	PSY
.71	55.	Trouble concentrating.	OBS
.70	37.	Feeling that people are unfriendly or dislike you.	INT
.70	79.	Feelings of worthlessness.	DEP
.69	43.	Feeling that you are watched or talked about by others.	PAR
.68	36.	Feeling others do not understand you or are unsympathetic.	INT
.68	69.	Feeling very self-conscious with others.	INT
.67	54.	Feeling hopeless about the future.	DEP
.67	71.	Feeling everything is an effort.	DEP
.66	26.	Blaming yourself for things.	DEP
.65	46.	Difficulty making decisions.	OBS
.65	29.	Feeling lonely.	DEP
.65	11.	Feeling easily annoyed or irritated.	ANG
.64	41.	Feeling inferior to others.	INT
.64	83.	Feeling that people will take advantage of you if you let	PAR
.63	34.	Your feelings being easily hurt.	INT
.63	90.	The idea that something is wrong with your mind.	PSY
.62	18.	Feeling that most people cannot be trusted.	PAR
.62	89.	Feelings of guilt.	ADD
.62	31.	Worrying too much about things.	DEP
.62	22.	Feelings of being trapped or caught.	DEP
.61	23.	Suddenly scared for no reason.	ANX
.61	57.	Feeling tense or keyed up.	ANX
.60	3.	Repeated unpleasant thoughts that won't leave your mind.	OBS

^aStandardized Solution.^bOBS=Obsessive-Compulsive, INT=Interpersonal Sensitivity, DEP=Depression, ANX=Anxiety, ANG=Anger-Hostility, PAR=Paranoid Ideation, PSY=Psychoticism, ADD=Additional Scales.Note. Maximum Likelihood Solution (EQS)Note. N=291.

Interpersonal Sensitivity were retained in this scale.

Presumably, symptoms related to these types of emotional problems constitute a prominent dimension for young adults in university.

The overall correlation matrix for these revised scales is displayed in Table 11. Some scales have been altered by a scalar in order to make the magnitudes of the covariances more similar, a procedure which helps facilitate convergence of covariance models. All subsequent LVSEM analyses were performed on the associated covariance matrix. Researchers interested in recreating this covariance matrix should refer to the standard deviations for the revised scales listed in Table 12.

Measurement Model

Prior to investigating the complete cross-lagged panel model, an abbreviated latent variable structural equation model was designed in order to check whether a Self-Enhancing Illusions latent variable was in fact defined by the revised subscales of the BIDR, NPI, and SOCQ and that this latent variable negatively covaried with the refined SCL-90-R scale. This amounts to an assessment of the measurement model, which is a procedure generally recommended to precede the analysis of structural components.

In this case, the Time One variables were used. Six revised scales were allowed to load onto one latent variable: Leadership/Authority and Vanity/Self-Admiration from the NPI, Self-Deceptive Enhancement (affirmed) and Self-Deceptive

Table 11

Correlation Matrix of Primary Variables (Revised)

	SDE+1	SDE-1	HD1	LD1	LEAD1	VAIN1	GSI1
SDE+1	1.0						
SDE-1	.41	1.0					
HD1	.39	.28	1.0				
LD1	.39	.29	.45	1.0			
LEAD1	.22	.27	.35	.10	1.0		
VAIN1	.16	.16	.30	.09	.42	1.0	
GSI1	-.43	-.53	-.18	-.32	-.24	-.12	1.0
SDE+2	.61	.37	.29	.24	.25	.22	-.33
SDE-2	.41	.56	.30	.29	.23	.17	-.40
HD2	.37	.20	.67	.39	.36	.32	-.15
LD2	.43	.34	.40	.73	.07	.08	-.32
LEAD2	.21	.26	.37	.13	.82	.41	-.21
VAIN2	.21	.14	.30	.09	.45	.79	-.13
GSI2	-.38	-.42	-.14	-.24	-.19	-.12	.77

	SDE+2	SDE-2	HD2	LD2	LEAD2	VAIN2	GSI2
SDE+1							
SDE-1							
HD1							
LD1							
LEAD1							
VAIN1							
GSI1							
SDE+2	1.0						
SDE-2	.45	1.0					
HD2	.37	.26	1.0				
LD2	.30	.33	.45	1.0			
LEAD2	.27	.26	.41	.13	1.0		
VAIN2	.24	.10	.38	.09	.46	1.0	
GSI2	-.37	-.38	-.10	-.29	-.22	-.13	1.0

Note. N=291

Note. Some variables are transformed by a scalar in order to equate the magnitudes of the covariances: SOCQ subscales are divided either by 25 (High-Desirability) or 20 (Low Desirability), NPI subscales are multiplied by 2, and the SCL-90-R subscale is divided by 6.

Table 12

Means, Standard Deviations, and Cronbach Alphas of Revised Scales

Variable	<u>M</u>	<u>SD</u>	Cronbach Alpha	Number of Items
SDE+1	20.31	4.454	.63	5
SDE-1	20.22	4.976	.60	5
HD1	25.43	3.917	.80	10
LD1	23.00	3.913	.76	6
LEAD1	5.87	4.208	.77	7
VAIN1	4.82	3.722	.69	7
GSI1	4.98	3.324	.95	27
SDE+2	20.67	4.338	.68	5
SDE-2	20.16	4.596	.58	5
HD2	26.08	3.842	.82	10
LD2	20.94	3.720	.78	6
LEAD2	5.90	4.462	.80	7
VAIN2	5.12	4.085	.74	7
GSI2	5.02	3.408	.96	27

Note. N=292.

Enhancement (denied) from the BIDR, and High-Desirability and Low-Desirability from the SOCQ. The metric of the latent variable was defined by setting the path of SDE (affirmed) to one. The six pairs of possible correlated error terms for each of the three pairs of related subscales were estimated. Finally, this latent variable was allowed to covary with the Symptomatic Distress manifest variable derived from the SCL-90-R.

The maximum likelihood solution (normal distribution theory) produced a chi-square of 53.1 ($df=11$, $N=291$), $p<.001$, with a comparative fit index of .90. The average off-diagonal absolute standardized residual was .049. This represents a moderately good fitting model. Standardized path coefficients for the Self-Enhancing Illusions latent variable ranged from 0.76 for SDE (denied) to 0.23 for Vanity/Self-Admiration²⁰. The correlation between the Self-Enhancing Illusions latent variable and Symptomatic Distress was $r=-0.63$ ²¹. This cross-sectional model therefore appears to be adequate for extending to the complete longitudinal model. The lower path coefficient for Vanity/Self-Admiration indicates that this subscale may be a rather weak indicator of the Self-Enhancing Illusions latent variable. The

²⁰. The total set of standardized paths were as follows: 0.73 for SDE-a, 0.76 for SDE-d, 0.35 for L/A, 0.23 for V/S-A, 0.44 for HD, and 0.46 for LD. The correlations between errors were $r=-0.32$ for SDE-a and SDE-d, $r=0.37$ for L/A and V/S-A, and $r=0.31$ for HD and LD.

²¹. An examination of the overall scatter-plot of summed SEI variables and the Global Severity Index of the SCL-90-R indicated that this relationship is essentially linear.

decision was made to retain this subscale in the final analyses, however, because of earlier research linking items in the subscale with aspects of healthy narcissism.

Panel LVSEM analysis

Following the refinement of subscales of the primary measures and the check of measurement model, an overall latent variable structural equation model was designed. This model incorporated the subscales from the BIDR, NPI, and SOCQ as manifest indicators of a Self-Enhancing Illusion latent variable. Symptomatic distress was measured by the condensed SCL-90-R subscale. Within the Time One data set, the covariance between Symptomatic Distress and Self-Enhancing Illusion was estimated. Between the Time One and Time Two data sets, a longitudinal panel structure was modeled, with same-variable autocorrelations and between-variable cross-lag paths. Finally, various correlated error terms were added to the model in order to help determine a well fitting solution (see Figure 1). LVSEM analyses were conducted using EQS version 3.0²².

The maximum likelihood solution (normal distribution theory) produced a chi-square of 142.3 ($df=56$, $N=291$), $p<.001$, with a comparative fit index of .96 (see Figure 1; see Appendix 5 for correlations of error terms). The average off-diagonal absolute standardized residual was .047. This represents a moderately

²². The manual used for these analyses was for EQS version 2.1 (Bentler, 1985).

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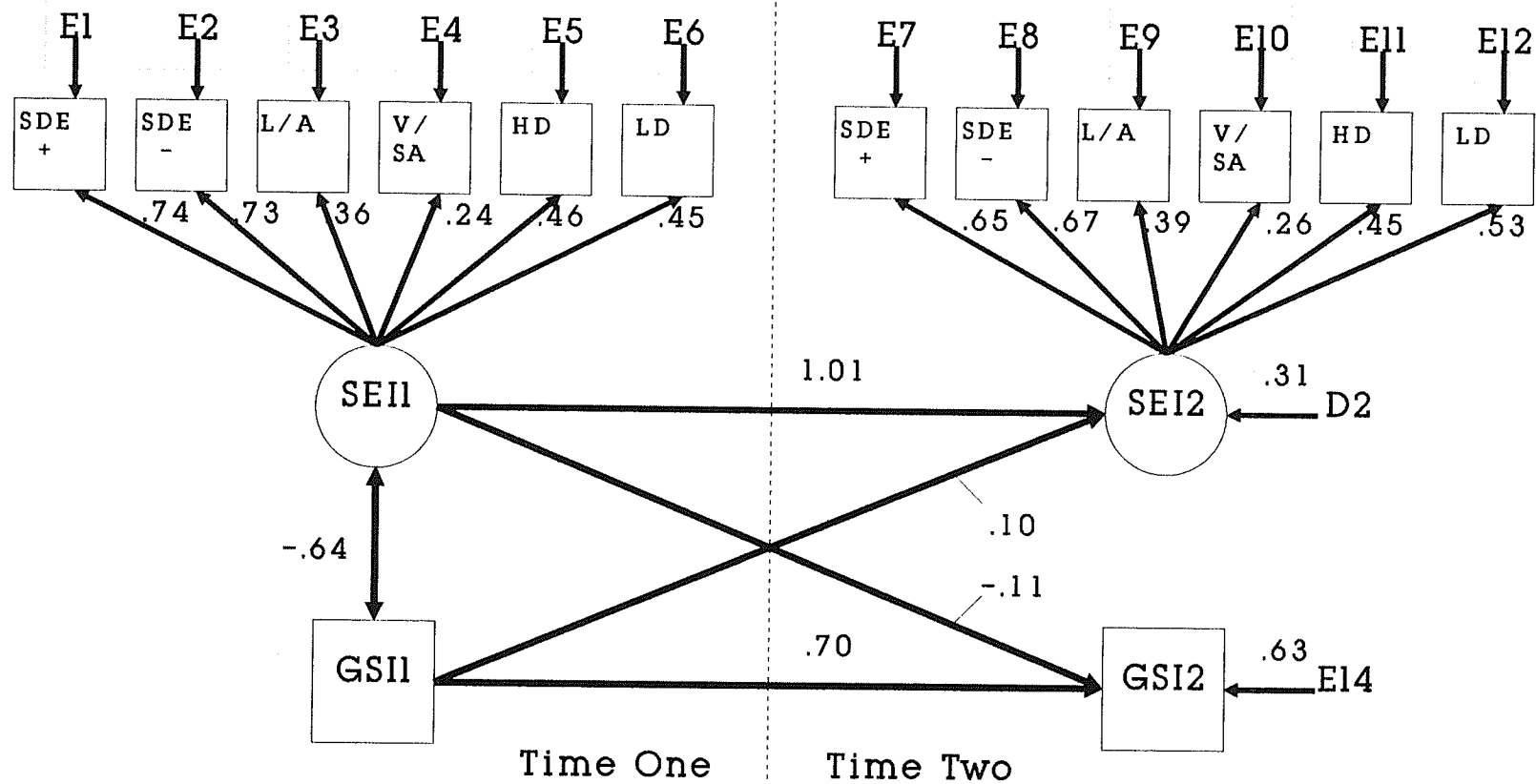


Figure 1: Maximum-likelihood solution (standardized).
(GLObal Severity Index of SCL-90-R)

good fitting model. Note that all of the manifest indicators of the Self-Enhancing Illusion latent variable load significantly, with standardized parameters ranging from .24 for Vanity/Self-Admiration (Time One) to .74 for Self-Deceptive Enhancement (Affirmed) (Time One). This confirms the prediction that measures of self-enhancing illusions taken from three distinct research streams share sufficient common variance to identify a single underlying latent variable. This suggests, therefore, that these different types of measures, although derived independently, appear to be tapping into a more general phenomenon.

The hypothesis that there would exist a significant covariation between Self-Enhancing Illusions and Symptomatic Distress at Time One was also confirmed, with a standardized parameter of $-.64$. This correlation between symptomatic distress and self-enhancing illusions is as high as or higher than any correlation reported by related studies previously reviewed.

The more critical results in terms of the longitudinal hypotheses are those of the two cross-lags. The path from Self-Enhancing Illusions (Time One) to Symptomatic Distress (Time Two) produced an estimated parameter of $-.112$, with a standard error of $.060$, and a test statistic of -1.870 . This test statistic is a univariate test that the population coefficient is zero. The standard normal critical value is 1.96 (absolute), associated with a normal z -test $.05$ probability level of significance.

Based upon this standard, therefore, the parameter just misses significant. The standardized parameter was $-.108$. This means that higher levels of the Self-Enhancing Illusion latent variable at Time One did predict lower levels of Symptomatic Distress at Time Two, ten weeks later, but that this effect appears to be small and unreliable. This is at best very weak support for the hypothesis that self-enhancing illusions have a beneficial impact on emotional well-being.

Interestingly, the other cross-lag path from Symptomatic Distress (Time One) to Self-Enhancing Illusions (Time Two) also showed a small, although nonsignificant, effect. The estimated parameter was $.082$, standard error $.058$, and test statistic 1.405 . This means that there was a slight, although unreliable, tendency for higher levels of Symptomatic Distress to predict higher levels of the Self-Enhancing Illusions latent variable. The standardized parameter was $.096$. Perhaps distress due to psychopathological symptoms puts some weak pressure on a person's tendency to exhibit self-enhancing illusions at a later time.

A brief note should be made of the standardized auto-regression derived for the Self-Enhancing Illusions latent variable (1.01). Obviously, this standardized parameter should not exceed 1.0 and in fact EQS attempts to insure that no parameter does so. This aberrant result is likely due to a combination of cumulated calculation errors and to the fact that the true across-time correlation of the Self-Enhancing Illusions

latent variable is likely quite close to 1.0²³.

Next, issues related to multivariate distributional assumptions were examined. The normalized estimate of multivariate kurtosis for this model was fairly moderate (3.43), suggesting that the data exhibited only minor multivariate nonnormality. Estimates ranging from -2 to +2 are generally considered to be consistent with multivariate normality.

Maximum likelihood solutions are considered to be relatively robust to violations of assumptions of multivariate normality, however, a generalized least squares solution (based on arbitrary distribution theory) of the model was also examined in order to check the ML results. Model estimation based on arbitrary distribution theory assumes no restrictions on skewness and kurtosis, which can obviously be advantageous when analysing nonnormal data. The primary disadvantage of this estimation technique, however, are that a significantly higher sample size to free parameter ratio is required (in the range of 10 to 1) (Bentler, 1985). In the case of this study, the sample size should be appropriate for normal distribution techniques but is likely too small (by about 40%) for estimating stable models based on arbitrary distribution theory. Nevertheless, solutions derived from less restrictive distributional assumptions may have

²³. This raises the question of whether the SEI latent variable is actually too stable for detecting causal effects. Either longer time lags might be needed to detect greater variance or nonnormal samples could be studied, where personality variations might be more significant.

value for exploring model structures.

The iterated generalized least squares (GLS) solution (arbitrary distribution theory) produced a chi-square of 171.2 ($df=56$, $N=291$), $p<.001$, with a comparative fit index of .89 (see Figure 2). The average off-diagonal absolute standardized residual was .096. Clearly, this solution appears to indicating a less successful fit for the model, relative to the ML solution. Nevertheless, the results based on nonnormal distribution theory may have some utility as a check on those obtained under normal distributional assumptions. For the most part, the GLS results are quite similar to those obtained by the ML solution. What stands out as more significant is the result that the cross-lag path from Self-Enhancing Illusions (Time One) to Symptomatic Distress (Time Two) was $-.136$, with a standard error of $.052$, and a test statistic of -2.627 . The standardized parameter increased to $-.121$. This result is now large enough to comfortably reach statistical significance. The other cross-lag path from Symptomatic Distress (Time One) to Self-Enhancing Illusions (Time Two) is now practically zero.

There is obviously some question about which solution to believe most. The ML solution would be preferred given the sample size, however the GLS solution has the advantage of less restrictive distributional assumptions. Probably the best solution would be to consider both and to conclude that there is only weak evidence that the predicted Self-Enhancing Illusions

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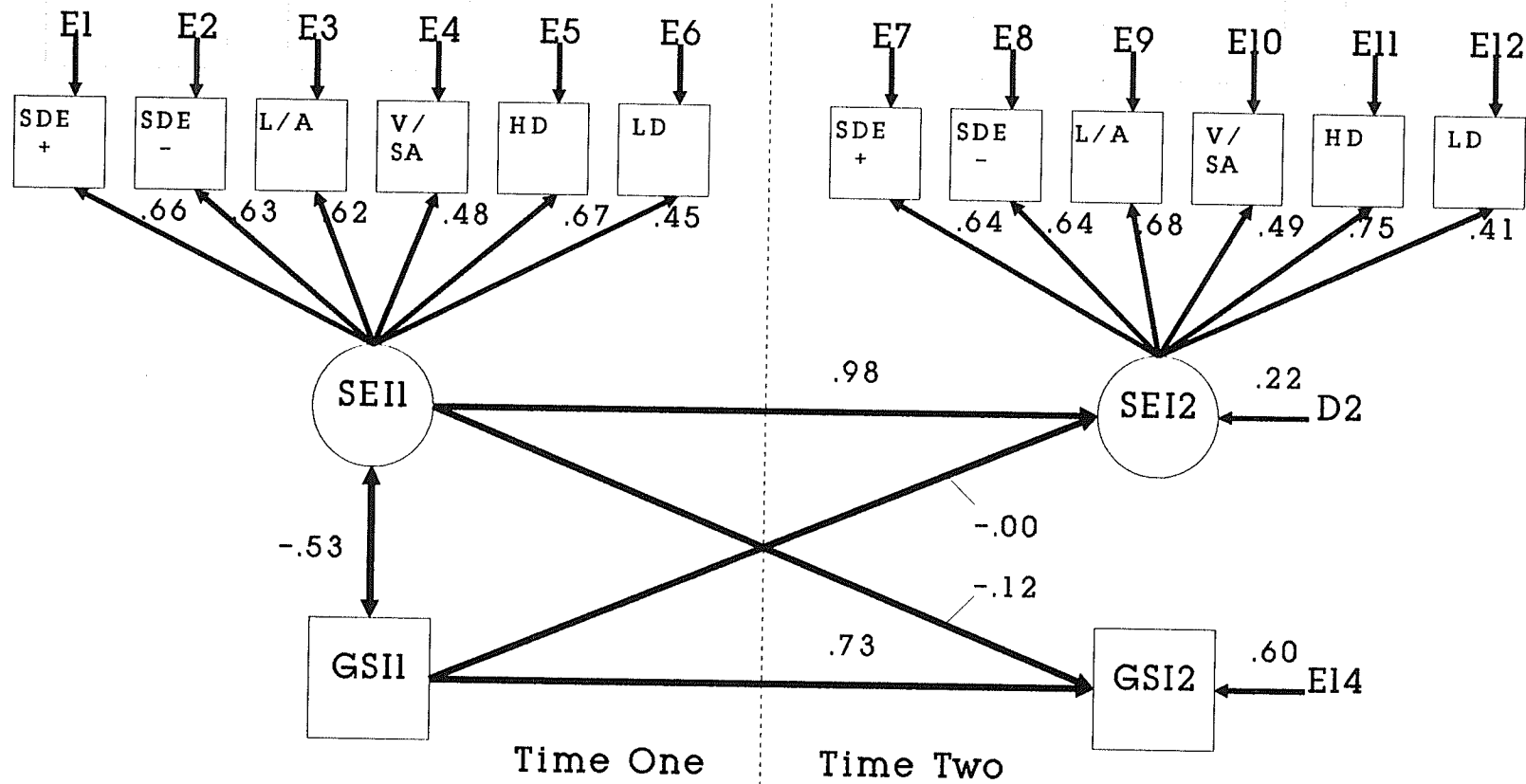


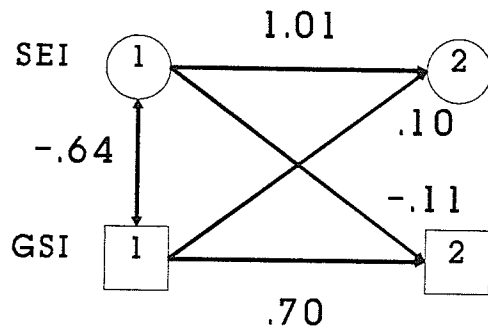
Figure 2 : GLS (arbitrary distribution) (standardized)
(Global Severity Index of SCL-90-R)

(Time One) to Symptomatic Distress (Time Two) cross-lag path is significant. If the effect exists, it is at best a small one. It is also quite possible that the cross-lag effect would erode if the present study were to be replicated. This is in contrast to the observations that distinct manifest measures load onto one Self-Enhancing Illusions latent variable and that this SEI latent variable shows a substantial within-time covariation with Symptomatic Distress, which are likely fairly durable results.

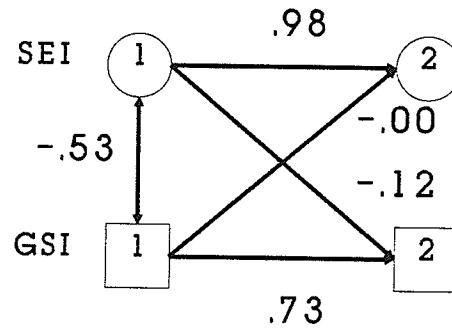
Alternative Scoring of the Symptomatic Distress Scale. The previous analyses of the revised SCL-90-R subscale used the standard scoring format: the grand total of the degree of symptom distress rated on a five-point scale ranging from "0-Not at all" to "4-Extremely". An alternative scoring method is the Positive Symptom Total: the number of nonzero responses. Highest scores are obtained by individuals endorsing the greatest number of symptoms, of whatever degree of distress. The PST could be interpreted as an indicator of the breadth of symptomatic distress.

The LVSEM panel model discussed above was repeated, but using the PST score of revised SCL-90-R scale. The maximum likelihood solution (normal distribution theory) produced a chi-square of 146.4 ($df=56$, $N=291$), $p<.001$, with a comparative fit index of .96 (see Figure 3). The average off-diagonal absolute standardized residual was .049. This represents a moderately good fitting model, nearly the same as before. Estimated

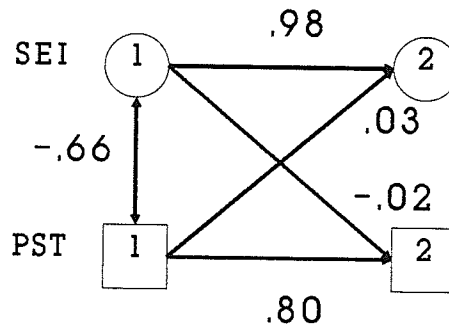
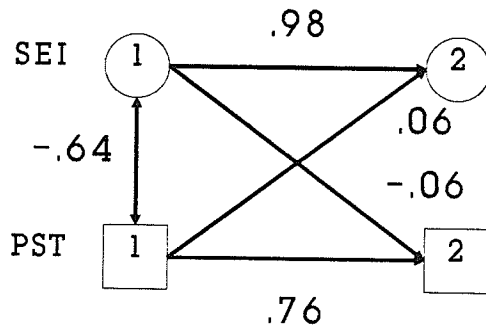
ML Solution



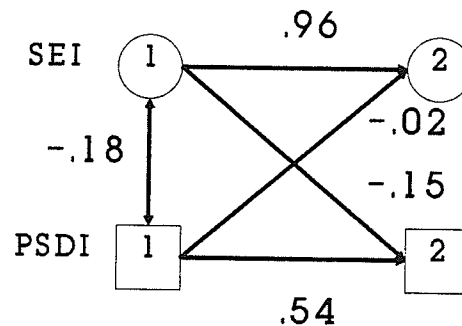
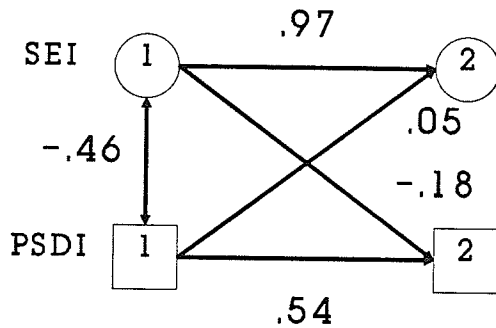
GLS (arb dist)



Global Severity Index of SCL-90-R.



Positive symptom total (PST) scoring format.



Positive symptom distress index (PSDI) scoring.

Figure 3: Model comparisons.

parameters were quite similar to those based on the standard scoring format for Symptomatic Distress. More notably, the cross-lag paths were even smaller. The SEI (Time One) to Symptomatic Distress (PST) (Time Two) parameter became $-.024$, standard error $.023$, and test statistic -1.038 . The other cross-lag became $.129$, standard error $.148$, and test statistic $.896$. Standardized parameters were $-.059$ and $.058$ respectively.

Interestingly, results from the generalized least squares solution (arbitrary distribution theory) were now quite similar to those obtained from the maximum likelihood solution. The chi-square was 154.7 ($df=56$, $N=291$), $p<.001$, with a comparative fit index of $.91$ and average off-diagonal absolute standardized residual of $.095$ (see Figure 3). Both cross-lag paths were practically zero: SEI (Time One) to SD (Time Two) parameter $-.009$ (standard error $.022$, test statistic $-.426$); and SD (Time One) to SEI (Time Two) parameter $.073$ (standard error $.104$, test statistic $.701$).

This agreement between the ML and GLS solutions gives a pretty clear result. When the SCL-90-R scale was scored as a Positive Symptom Total, the cross-lag effects were wiped out. In particular, the Self-Enhancing Illusions latent variable showed no relationship to later decreases in number of symptoms.

Finally, a third scoring method, the Positive Symptom Distress Index (PSDI), was used with the revised SCL-90-R scale. This is calculated by dividing the overall mean score by the

Positive Symptom Total. The SCL-90-R manual (Derogatis, 1983) described the PSDI as a pure intensity measure, corrected for number of symptoms. It is used as an indicator of "augmenting" versus "attenuating" response styles for individuals rating symptomatic distress. Whereas the PST represents breadth of symptoms, the PSDI captures the level of intensity felt by the rater for whatever symptoms are experienced.

Again, the full model was re-estimated, this time using the PSDI scoring method. The maximum likelihood solution (normal distribution theory) produced a chi-square of 129.3 ($df=56$, $N=291$), $p<.001$, with a comparative fit index of .96 (see Figure 3). The average off-diagonal absolute standardized residual was .048. This represents a good fitting model, again nearly the same as before. Most estimated parameters were quite similar to those based on the standard scoring format for Symptomatic Distress. In this case, however, the cross-lag paths showed a different pattern. The SEI (Time One) to Symptomatic Distress (PSDI) (Time Two) parameter became $-.162$, standard error $.055$, and test statistic -2.921 . The standardized parameter was $-.179$. The other cross-lag, SD (Time One) to SEI (Time Two), remained small: parameter estimate $.045$, standard error $.050$, and test statistic $.884$.

Similarly, the results from the generalized least squares solution (arbitrary distribution theory) were again quite similar to those obtained from the maximum likelihood solution. The chi-

square was 145.7 ($df=56$, $N=291$), $p<.001$, with a comparative fit index of .91 and average off-diagonal absolute standardized residual of .086 (see Figure 3). The SEI (Time One) to SD (Time Two) parameter was now $-.162$ (standard error .049, test statistic -3.010). The standardized parameter was $-.148$. The SD (Time One) to SEI (Time Two) cross-lag path still remained small: parameter $-.019$ (standard error .029, test statistic $-.675$).

In the case of the PSDI scoring format, therefore, cross-lag effects consistent with the initial hypotheses were obtained by both the ML and GLS solutions. What was unexpected, however, was that the most significant effect of Self-Enhancing Illusions on later Symptomatic Distress focused on reducing the intensity of those symptoms. In contrast, Self-Enhancing Illusions showed no reliable effect for predicting a reduction in the number of symptoms reported (see Table 13 for a summary of the cross-lagged paths).

Table 13

Summary of Cross-Lagged Parameters

Estimation Method				
Cross-Lag	Estimated Parameter	Standard Error	Test Statistic	Standardized Parameter
<u>Global Severity Index (GSI)</u>				
ML				
SEI1 to GSI2	-.112	.060	-1.870	-.108 (ns)
GSI1 to SEI2	.082	.058	1.405	.096 (ns)
AGLS				
SEI1 to GSI2	-.136	.052	-2.627.	-.121 (sig)
GSI1 to SEI2	-.001	.034	-0.025	-.001 (ns)
<u>Positive Symptom Total (PST)</u>				
ML				
SEI1 to PST2	-.024	.023	-1.038	-.059 (ns)
PST1 to SEI2	.129	.148	.896	.058 (ns)
AGLS				
SEI1 to PST2	-.009	.022	-.426	-.022 (ns)
PST1 to SEI2	.073	.104	.701	.032 (ns)
<u>Positive Symptom Distress Index (PSDI)</u>				
ML				
SEI1 to PSDI2	-.162	.055	-2.921	-.179 (sig)
PSDI1 to SEI2	.045	.050	.884	.047 (ns)
AGLS				
SEI1 to PSDI2	-.162	.049	-3.010	-.148 (sig)
PSDI1 to SEI2	-.019	.029	-.675	-.023 (ns)

Note. The standard normal critical value is 1.96 (absolute), associated with a normal z-test .05 probability level of significance.

Discussion

Results of this study confirmed that subscales of the three self-enhancing illusion measures loaded onto a single latent variable. This means that there is considerable overlapping variance between these measures, even though each was derived from a different base of psychological research. This latent variable was also quite stable over time, suggesting that a tendency to exhibit self-enhancing illusions may operate much like a personality trait.

These findings support the conclusion that studies of non-veridical self-schemas conducted by researchers in the areas of socially-desirable responding, social-cognition, and narcissistic personality functioning are tapping into the same underlying phenomenon. In short, it is common for many people to "lie" to themselves to some extent by maximizing their positive characteristics and by minimizing their negative characteristics in order to make themselves feel especially worthy relative to other people. This appears to be a generalized human tendency that has been identified by several separate research paradigms.

In the present research, this self-enhancing illusion latent variable was marked most strongly by the Self-Deceptive Enhancement subscales of the BIDR-6. Self-enhancers, therefore, endorsed such SDE items as "I am fully in control of my life", and "I am a completely rational person", and rejected such items as "I have not always been honest with myself", and "It's hard

for me to shut off a disturbing thought". On the SOCQ, self-enhancers tended to view themselves as substantially more "clear-headed", "intelligent", and "perceptive" and less "irrational", "incompetent", and "dishonorable" than their peers. On the NPI, self-enhancers endorsed such items as "People always seem to recognize my authority", "I see myself as a good leader", and, to a lesser extent, items such as "I like to show off my body". Although there was no objective assessment of whether or not self-enhancers were truly as superior as they claimed, the extreme or extraordinary nature of their self-descriptions strongly suggests illusory beliefs.

Closer examination of these SEI items also suggests a pattern of self-aggrandizement related to self-control, cognitive resources, and power. Self-enhancers exaggerated their abilities to effect changes in themselves and in others. Perhaps it is not just self-enhancement of positive or attractive qualities per se that is important but specific exaggerated beliefs of self-efficacy. The person not only views their own self as "better" but as "better at accomplishing".

Notice that this pattern of self-enhancement sounds stereotypically masculine. This could be an accident of the particular scales selected to tap SEI, but it suggests that it would be interesting to look for possible gender or cultural differences in styles of self-enhancing illusions. Perhaps there are many different types of self-enhancing illusion which

parallel the significant dimensions upon which human beings measure themselves relative to others. Illusions related to altruism, beauty, morality, creativity, or athletic prowess, among others, might be identified by future research.

Notice also that the results of this study are consistent with the definition of self-enhancing illusion given earlier. First, both the exaggeration of positive traits and the denial of negative traits appeared as components of SEI. Second, these self-ratings also appeared to be unrealistic. On the BIDR-6, many respondents subscribed to an idealized but rather unlikely self-description. On the NPI, many respondents endorsed items consistent with a self-aggrandizing personality style. On the SOCQ, many respondents claimed to be superior to their peers on a wide range of character traits. Thirdly, the small negative effect of SEI on the intensity of later symptomatic distress is consistent to some extent with the view that self-enhancing illusions are motivated by improved emotional states.

Results of this study also confirmed the conclusions of earlier research that most of the SCL-90-R subscales tap a general factor of symptomatic distress. The final reduced Symptomatic Distress variable was characterized by such symptoms as "The feeling that something bad is going to happen to you", "Feeling blue", "Feeling uneasy when people are watching or talking about you", "Feeling lonely even when you are with people", and "Trouble concentrating". Overall, these items

suggest some the troubled thoughts, feelings, and interpersonal relationships that would be more common in nonclinical populations.

Hypothesis 1 was strongly supported. A substantial negative covariation/correlation between Self-Enhancing Illusions and Symptomatic Distress was observed at Time One. This is consistent with previous correlational research. One implication of this result is that more useful assessments of emotional health might be possible from additional consideration of self-enhancing illusions. For example, individuals experiencing symptoms of emotional distress, but who are also generally characterized by self-enhancing illusions, may have a better prognosis than similarly distressed persons who do not tend to self-enhance.

In contrast to Hypothesis 1, Hypothesis 2 was rather weakly supported. More Self-Enhancing Illusion at Time One did predict less Symptomatic Distress at Time Two ten weeks later. However, this effect was significant only upon the intensity of symptomatic distress and not on the overall number of symptoms. It appears that self-enhancers experiencing emotional distress will continue to report about the same number of symptoms 10 weeks later but they will rate these symptoms as having become less distressing. Non-self-enhancers would show the opposite trend. Although this result was not specifically anticipated, it nevertheless represents one of the first pieces of evidence that

self-enhancing illusions may play a more direct role in the maintenance of emotional wellbeing.

Hypothesis 3 was also confirmed. More Symptomatic Distress at Time One did not predict more Self-Enhancing Illusion at Time Two. Curiously, however, there was a slight nonsignificant positive effect. This suggests that symptomatic distress may serve as a weak cue for triggering counter-acting self-enhancing illusions at a later time. This result is consistent with studies reported by Pelham (1991). In this research, depressed subjects were observed to react to their acute distress with self-serving biases and attempts to develop more positive self-views. These findings were interpreted as evidence of a natural "healing" process exhibited by people experiencing distressing depressive mood states. Obviously, although the nonsignificant trend obtained in the present study is consistent with that interpretation, the small size of the effect would require additional study before it could be treated as reliable.

Overall, these results appear to indicate that in a population of relatively healthy individuals self-enhancing illusions have a beneficial impact on the emotional wellbeing of the individual by reducing the intensity of later levels of symptomatic distress. In this way, emotional health may be enhanced by self-enhancing illusions.

Before moving on to a discussion of the possible significance of these findings, the question of whether there are

any other multivariate models that could explain these results should be addressed. The issue of spurious or unidentified additional variables that could account for the observed covariances arises here.

Is it tenable that unidentified third variables could be involved in the relationship between self-enhancing illusions and emotional health? Yes, it would appear that it is. First, although the overall model is a good fit of the data, there remains some room for improvement. This leaves the door open for revising the model by including additional variables. Second, the cross-lagged paths are small, meaning that they may be vulnerable to being knocked down to zero. If these paths were already large, then the possibility of finding a spurious third variable that eliminates the self-enhancing illusions effect would be more remote. Third, the substantial within-time covariation between Self-Enhancing Illusions and Symptomatic Distress, relative to the small across-time regression path, is consistent with the hypothesis that at least a significant proportion of the relationship between these two variables could be due to a common third causal variable.

One potential third variable could be environmental stress. Some stressful event, say a failed exam, might cause a decrease in self-enhancing illusions while also causing an increase in emotional distress. If the present study were to be repeated, but with measures of earlier environmental stress added to the

model, then the question of spuriousness could be examined. If the revised model fit better (this could be assessed hierarchically within the same study), if the cross-lagged paths between Self-Enhancing Illusions and Symptomatic Distress dropped to zero, and if the new paths from environmental stress to Self-Enhancing Illusions and Symptomatic Distress were significant, then spuriousness most likely explains (or is at least significantly more important than) the earlier cross-lagged results.

Nevertheless, until this potential spurious variable is identified and studied, the present results can be interpreted as at least consistent with a hypothesis of a causal relationship between self-enhancing illusions and symptomatic distress. It must be conceded, however, that such a model is vulnerable to disconfirmation. Future research should look for possible spurious variables that would support alternative models.

Accepting that the non-spurious explanation is true, a number of implications for public mental health are suggested by this research. Because self-enhancing illusions appear to play a small role in the maintenance of normal emotional wellbeing, this would imply that it could be inappropriate to automatically attempt to "correct" a person's unrealistic and irrational beliefs about themselves. Clinicians, educators, and others involved in influencing the beliefs of other people may need to be alerted to the potential value of non-veridical self-beliefs,

especially given that the moral foundation of our society has always favoured veridical self-knowledge.

Perhaps this natural cognitive process could be incorporated into direct clinical interventions for people experiencing more severe emotional distress. For example, psychotherapy could be oriented towards assessing and facilitating self-enhancing illusions, perhaps using techniques such as those employed by current cognitive therapies. Alternatively, humanistic therapy styles emphasizing such techniques as unconditional positive regard and empathy may be used to indirectly facilitate enhanced self-images. Therapies which promote self-enhancing illusions would likely be most effective for people suffering from emotional problems characterized by negative self-schemas, such as depression, low self-esteem, and post-traumatic shame.

Cognitive therapists may already be helping their clients to develop self-enhancing illusions, even though the stated goal of most cognitive therapy is to help the patient to become more rational and realistic. For example, by identifying and changing such non-veridical depressogenic cognitions as "I am worthless", cognitive therapy may inadvertently foster another non-veridical cognition such as "Really, I am wonderful". The client is supposed to base their self-knowledge on a realistic and rational appraisal of the evidence but it may be more common, and appropriate, for them to develop other non-veridical cognitions, which in this case happen to be health-promoting. Hopefully, no

competent cognitive therapist would attempt to stop a client from forming such a self-enhancing belief, even if that contradicts the intended therapeutic goal of thinking "realistically".

Presumably, if the client's emerging self-enhancing beliefs help him or her to feel better and don't hurt anybody else, then they should be allowed to develop.

Another relevant issue is whether self-enhancing illusions ever become disadvantageous. Probably the healthiest self-enhancing illusions are those which do not impede the adaptability of the individual to changes in circumstances. For example, if someone believes that he is particularly attractive to women, but he has never had a date, then clearly his illusions are unresponsive to the actual events in his life and may be interfering with his ability to change his behaviour in order to improve his love life. Ideally, his self-beliefs should be flexible enough to accommodate the need for genuine self-growth. An optimal balance would accommodate realistic efforts for self-improvement while maintaining the benefits of optimism and resilience that would come from self-enhancement.

Related to this issue, a recent study by Shedler, Mayman, and Manis (1993) makes a serious attack on the role of illusions involved in mental health. In a provocative criticism of "objective" mental health scales, they argued that standard self-report instruments are unable to distinguish those individuals characterized by "illusory mental health" (i.e., false negatives)

from those who are genuinely healthy. In other words, the defensive denial of distress by some people makes these measures invalid, prompting the authors to recommend more qualitative methodologies where less biased expert clinical judgements may be more readily utilized. Evidence supporting this interpretation came primarily from two sources. First, expert clinical judges determined that some subjects claiming to be mentally healthy on self-report measures (such as the Eysenck Neuroticism scale or the Beck Depression Inventory) were in fact denying emotional distress, based on a study of the subjects responses on an open-ended early memory test. Second, these "illusory" subjects showed greater physiological reactivity on measures of heart-rate and blood pressure when exposed to psychological stressors, thus associating illusory mental health with risk factors for coronary heart disease.

What implications does Shedler, Mayman, and Manis (1993) have for the present research? First, their criticism of self-report measures is not new, because this is essentially the same argument made by the early developers of social-desirability instruments. The reemergence of this perspective is likely in reaction to the more recent success of the "substantive" interpretation of SDR measures, reviewed earlier. This is an old debate which neither side seems presently capable of winning outright.

Second, there may be a substantial difference between people

who make exaggerated self-aggrandizing judgements about themselves in order to surpass their peers versus those people who present a superficial picture of mental health (readily invalidated by a simple projective assessment) in order to avoid awareness of their emotional conflicts, thereby giving them membership with the rest of the "normal" crowd. In other words, to score low on the BDI at most means that the person is claiming to be as mentally healthy as the average person. Only with SEI-type measures would it be possible to distinguish those individuals whose perceived self-images lift them above the average. This latter group may respond differently, both behaviourally and physiologically, to psychological stress. Obviously, additional research is needed to address this possibility.

Nevertheless, it is also certain that some emotional problems are simply too severe to be affected by an increase in some type of self-aggrandizing bias. For example, a person suffering from a psychosis may believe that she is Joan of Arc, but this self-enhancing belief is a product of her illness and fully incorporated into her symptomatology. Therapy designed to increase her self-enhancing illusions would likely be quite useless for producing any significant therapeutic impact on such a disorder. Being able to identify and accommodate to "reality" is still a useful distinction between the mentally healthy and the mentally ill. What may be typical for most ordinary

emotionally well people, however, is that their illusory perceptions allow reality to be bent enough for comfort but at the same time these perceptions are not so distorted that the person's basic hold on reality is broken.

The underlying emotional environment of the individual may be of major importance for determining whether self-enhancing illusions represent healthy or unhealthy manifestations of personality functioning. Self-enhancing illusions which are based on severely injured self-images, mistrust of others, prejudicial ignorance, or on pathological delusions are almost certainly maladaptive. Associated with strong feelings of fear or anger, these self-aggrandizing beliefs would represent a desperate attempt by the individual to protect themselves from perceived threats to their self-integrity, often by attacking others. In contrast, self-enhancing illusions which are based on an essentially normal self-structure, which do not interfere with an empathic understanding of others, and which permit personal growth are more likely to be adaptive. The premise of this research is that self-enhancing illusions of this latter type are fairly common in a normal population.

Note that it is not the recommendation of this discussion that self-enhancing illusions are necessarily the ideal way for human beings to cope with the world. Consciousness of other realities, detachment from self-illusions, existential courage, or any the other principles of psychological health espoused by a

variety of schools of thought, ranging from Psychoanalysis to Zen Buddhism, remain worthy goals. The main point is that self-enhancing illusions are important because they are both common and useful. For those of us too limited to reach the ideals of human perfection, we may find some solace from a competitive and hazardous world in the irrational judgements and distorted perceptions of our self-centred false bravado.

In conclusion, this research supports the view that there is a conceptual linkage between three well-developed areas of psychological research. Studies of socially-desirable responding, social-cognition, and narcissistic personality functioning may be detecting the same underlying phenomenon when correlations are observed between non-veridical self-enhancing beliefs and symptomatic distress. This research also represents some of the first evidence that a direct across-time causal relationship may exist between self-enhancing illusions and emotional distress, in that self-enhancing illusions predict a later decrease in the intensity of emotional distress. Although this effect appears to be relatively small, these results transcend the limitations of earlier correlational studies and offer support for continuing research in the area.

One avenue worth exploring in the future would be to study the role of self-enhancing illusions for people experiencing traumatic stress. Perhaps the value of self-enhancing illusions is greater under conditions of threat to personal integrity. The

failure of a self-protective cognitive reaction may contribute to the development of more serious psychopathology in some individuals experiencing distressing life events. Just as a healthy immune system is ready to heal an infection, self-enhancing illusions may be ready to counter-act disruptions to emotional stability. A failure in this cognitive system may leave the person susceptible to emotional illness.

Another area for future research would be to distinguish between self-enhancing illusions that the person truly believes to be true versus self-enhancing illusions that the person only imagines or pretends to be true. This is the difference between delusions and daydreams. There may be beneficial consequences for people who are capable of making rational and realistic appraisals of themselves but who also periodically stroke their self-images with self-enhancing fantasies. This could be understood as self-mythologizing, instead of self-deception.

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Appendix 1

Key
Cover sheet
Balanced Inventory of Desirable Responding - 6
Narcissistic Personality Inventory
Self-Other Comparison Questionnaire
Symptom Checklist - 90 - Revised

Note. These questionnaires may not appear precisely as presented to research participants, due to incidental formatting changes.

Ste. Foy I

General Instructions

This is the first phase of a two-part study on self-perceptions and emotions. In approximately 10 weeks, sign-up booklets will be distributed to your class so that you can sign-up for the second phase (titled **Ste. Foy II**). You will receive one hour of research credit for attending each phase. (Please note: Your responses can not be used in the final analysis unless you participate in both phases.)

Please complete the following in order to create a unique identification code that will link your phase I and phase II responses. It is important that you record the same code in both phases. This code will not be used to identify you. Your responses in this study are anonymous.

_____ The first letter of your first name.

_____ The first 3 letters of your mother's maiden name.

Male Female Your gender (circle one).

19____/____/____ Your date of birth (e.g., 1970/11/03).
(year/month/day)

Please proceed through the questionnaire booklet without skipping any items. When you are finished, bring it to the front and present your experimental credit card for signing.

Rate how much you agree with each statement according to the following scale.

I Agree:						
Not at all		Moderately			Very Much	
1	2	3	4	5	6	7

- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| 1. My first impressions of people usually turn out to be right. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. It would be hard for me to break any of my bad habits. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I have not always been honest with myself. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I don't care to know what other people really think of me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. When my emotions are aroused, it biases my thinking. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. I am not a safe driver when I exceed the speed limit. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. I always know why I like things. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. Once I've made up my mind, other people can seldom change my opinion. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. I am fully in control of my life. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. It's hard for me to shut off a disturbing thought. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. I never regret my decisions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. I sometimes lose out on things because I can't make up my mind soon enough. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. My parents were not always fair when they punished me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. I rarely appreciate criticism. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. The reason I vote is because my vote can make a difference. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. I have sometimes doubted my ability as a lover. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. I am a completely rational person. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. My solutions to problems are original and effective. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. I don't always know the reasons why I do the things I do. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. It's alright with me if some people happen to dislike me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. I sometimes tell lies if I have to. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. I never cover up my mistakes. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23. I never swear. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24. There are some occasions when I have taken advantage of someone. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 25. I always obey laws, even if I'm unlikely to get caught. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 26. I sometimes try to get even rather than forgive and forget. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 27. I have said something bad about a friend behind his or her back. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 28. I have received too much change from a salesperson without telling him or her. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 29. When I hear people talking privately, I avoid listening. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 30. I always declare everything at customs. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 31. When I was young I sometimes stole things. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 32. I have never dropped litter on the street. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 33. I sometimes drive faster than the speed limit. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 34. I have done things that I don't tell other people about. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 35. I have never read sexy books or magazines. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 36. I never take things that don't belong to me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 37. I have never damaged a library book or store merchandise without reporting it. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 38. I have taken sick-leave from work or school even though I wasn't really sick. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 39. I have some pretty awful habits. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 40. I don't gossip about other people's business. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

For each of the following pairs of attitudes, choose the one that you MOST AGREE with by circling EITHER A or B. Only mark ONE ANSWER for each attitude pair, and please DO NOT skip any items.

For example: A ☐ B ☒ (a) I prefer to study with music playing.
(b) I would rather study when it is quiet.

- A B (a) I have a natural talent for influencing people.
(b) I am not good at influencing people.
- A B (a) Modesty doesn't become me.
(b) I am essentially a modest person.
- A B (a) I would do almost anything on a dare.
(b) I tend to be a fairly cautious person.
- A B (a) When people compliment me I sometimes get embarrassed.
(b) I know that I am good because everybody keeps telling me so.
- A B (a) The thought of ruling the world frightens the hell out of me.
(b) If I ruled the world it would be a better place.
- A B (a) I can usually talk my way out of anything.
(b) I try to accept the consequences of my behavior.
- A B (a) I prefer to blend in with the crowd.
(b) I like to be the center of attention.
- A B (a) I will be a success.
(b) I am not too concerned about success.
- A B (a) I am no better or no worse than most people.
(b) I think I am a special person.
- A B (a) I am not sure if I would make a good leader.
(b) I see myself as a good leader.
- A B (a) I am assertive.
(b) I wish I were more assertive.
- A B (a) I like having authority over other people.
(b) I don't mind following orders.
- A B (a) I find it easy to manipulate people.
(b) I don't like it when I find myself manipulating people.
- A B (a) I insist upon getting the respect that is due me.
(b) I usually get the respect that I deserve.
- A B (a) I don't particularly like to show off my body.
(b) I like to show off my body.
- A B (a) I can read people like a book.
(b) People are sometimes hard to understand.
- A B (a) If I feel competent I am willing to take responsibility
for making decisions.
(b) I like to take responsibility for making decisions.
- A B (a) I just want to be reasonably happy.
(b) I want to amount to something in the eyes of the world.

- A B (a) My body is nothing special.
(b) I like to look at my body.
- A B (a) I try not to show off.
(b) I will usually show off if I get the chance.
- A B (a) I always know what I am doing.
(b) Sometimes I am not sure of what I am doing.
- A B (a) I sometimes depend on people to get things done.
(b) I rarely depend on anyone else to get things done.
- A B (a) Sometimes I tell good stories.
(b) Everybody likes to hear my stories.
- A B (a) I expect a great deal from other people.
(b) I like to do things for other people.
- A B (a) I will never be satisfied until I get all that I deserve.
(b) I take my satisfactions as they come.
- A B (a) Compliments embarrass me.
(b) I like to be complimented.
- A B (a) I have a strong will to power.
(b) Power for its own sake doesn't interest me.
- A B (a) I don't care about new fads and fashions.
(b) I like to start new fads and fashions.
- A B (a) I like to look at myself in the mirror.
(b) I am not particularly interested in looking at myself in the mirror.
- A B (a) I really like to be the center of attention.
(b) It makes me uncomfortable to be the center of attention.
- A B (a) I can live my life in any way I want to.
(b) People can't always live their lives in terms of what they want.
- A B (a) Being an authority doesn't mean that much to me.
(b) People always seem to recognize my authority.
- A B (a) I would prefer to be a leader.
(b) It makes little difference to me whether I am a leader or not.
- A B (a) I am going to be a great person.
(b) I hope I am going to be successful.
- A B (a) People sometimes believe what I tell them.
(b) I can make anybody believe anything I want them to.
- A B (a) I am a born leader.
(b) Leadership is a quality that takes a long time to develop.
- A B (a) I wish someone would someday write my biography.
(b) I don't like people to pry into my life for any reason.
- A B (a) I get upset when people don't notice how I look when I go out in public.
(b) I don't mind blending into the crowd when I go out in public.
- A B (a) I am more capable than other people.
(b) There is a lot that I can learn from other people.
- A B (a) I am much like everyone else.
(b) I am an extraordinary person.

65

Below is a list of problems people sometimes have. Please read each one carefully, and circle the number that best describes HOW MUCH THAT PROBLEM HAS DISTRESSED OR BOTHERED YOU DURING THE PAST 7 DAYS INCLUDING TODAY. Circle only one number for each problem using the following answer key. Do not skip any items.

Not at all	A little bit	Moderately	Quite a bit	Extremely
0	1	2	3	4

HOW MUCH WERE YOU DISTRESSED BY:

- | | | | | | | |
|-----|---|---|---|---|---|---|
| 1. | 0 | 1 | 2 | 3 | 4 | Headaches |
| 2. | 0 | 1 | 2 | 3 | 4 | Nervousness or shakiness inside |
| 3. | 0 | 1 | 2 | 3 | 4 | Repeated unpleasant thoughts that won't leave your mind |
| 4. | 0 | 1 | 2 | 3 | 4 | Faintness or dizziness |
| 5. | 0 | 1 | 2 | 3 | 4 | Loss of sexual interest or pleasure |
| 6. | 0 | 1 | 2 | 3 | 4 | Feeling critical of others |
| 7. | 0 | 1 | 2 | 3 | 4 | The idea that someone else can control your thoughts |
| 8. | 0 | 1 | 2 | 3 | 4 | Feeling others are to blame for most of your troubles |
| 9. | 0 | 1 | 2 | 3 | 4 | Trouble remembering things |
| 10. | 0 | 1 | 2 | 3 | 4 | Worried about sloppiness or carelessness |
| 11. | 0 | 1 | 2 | 3 | 4 | Feeling easily annoyed or irritated |
| 12. | 0 | 1 | 2 | 3 | 4 | Pains in heart or chest |
| 13. | 0 | 1 | 2 | 3 | 4 | Feeling afraid in open spaces or on the streets |
| 14. | 0 | 1 | 2 | 3 | 4 | Feeling low in energy or slowed down |
| 15. | 0 | 1 | 2 | 3 | 4 | Thoughts of ending your life |
| 16. | 0 | 1 | 2 | 3 | 4 | Hearing voices that other people do not hear |
| 17. | 0 | 1 | 2 | 3 | 4 | Trembling |
| 18. | 0 | 1 | 2 | 3 | 4 | Feeling that most people cannot be trusted |
| 19. | 0 | 1 | 2 | 3 | 4 | Poor appetite |
| 20. | 0 | 1 | 2 | 3 | 4 | Crying easily |
| 21. | 0 | 1 | 2 | 3 | 4 | Feeling shy or uneasy with the opposite sex |
| 22. | 0 | 1 | 2 | 3 | 4 | Feelings of being trapped or caught |
| 23. | 0 | 1 | 2 | 3 | 4 | Suddenly scared for no reason |
| 24. | 0 | 1 | 2 | 3 | 4 | Temper outbursts that you could not control |
| 25. | 0 | 1 | 2 | 3 | 4 | Feeling afraid to go out of your house alone |
| 26. | 0 | 1 | 2 | 3 | 4 | Blaming yourself for things |
| 27. | 0 | 1 | 2 | 3 | 4 | Pains in your lower back |
| 28. | 0 | 1 | 2 | 3 | 4 | Feeling blocked in getting things done |
| 29. | 0 | 1 | 2 | 3 | 4 | Feeling lonely |
| 30. | 0 | 1 | 2 | 3 | 4 | Feeling blue |
| 31. | 0 | 1 | 2 | 3 | 4 | Worrying too much about things |
| 32. | 0 | 1 | 2 | 3 | 4 | Feeling no interest in things |
| 33. | 0 | 1 | 2 | 3 | 4 | Feeling fearful |
| 34. | 0 | 1 | 2 | 3 | 4 | Your feelings being easily hurt |
| 35. | 0 | 1 | 2 | 3 | 4 | Other people being aware of your private thoughts |
| 36. | 0 | 1 | 2 | 3 | 4 | Feeling others do not understand you or are unsympathetic |
| 37. | 0 | 1 | 2 | 3 | 4 | Feeling that people are unfriendly or dislike you |
| 38. | 0 | 1 | 2 | 3 | 4 | Having to do things very slowly to ensure correctness |
| 39. | 0 | 1 | 2 | 3 | 4 | Heart pounding or racing |
| 40. | 0 | 1 | 2 | 3 | 4 | Nausea or upset stomach |
| 41. | 0 | 1 | 2 | 3 | 4 | Feeling inferior to others |
| 42. | 0 | 1 | 2 | 3 | 4 | Soreness of your muscles |

HOW MUCH WERE YOU DISTRESSED BY:

- | | | | | | | |
|-----|---|---|---|---|---|---|
| 13. | 0 | 1 | 2 | 3 | 4 | Feeling that you are watched or talked about by others |
| 14. | 0 | 1 | 2 | 3 | 4 | Trouble falling asleep |
| 15. | 0 | 1 | 2 | 3 | 4 | Having to check and double-check what you do |
| 16. | 0 | 1 | 2 | 3 | 4 | Difficulty making decisions |
| 17. | 0 | 1 | 2 | 3 | 4 | Feeling afraid to travel on buses, subways, or trains |
| 18. | 0 | 1 | 2 | 3 | 4 | Trouble getting your breath |
| 19. | 0 | 1 | 2 | 3 | 4 | Hot or cold spells |
| 20. | 0 | 1 | 2 | 3 | 4 | Having to avoid certain things, places, or activities because they frighten you |
| 21. | 0 | 1 | 2 | 3 | 4 | Your mind goes blank |
| 22. | 0 | 1 | 2 | 3 | 4 | Numbness or tingling in parts of your body |
| 23. | 0 | 1 | 2 | 3 | 4 | A lump in your throat |
| 24. | 0 | 1 | 2 | 3 | 4 | Feeling hopeless about the future |
| 25. | 0 | 1 | 2 | 3 | 4 | Trouble concentrating |
| 26. | 0 | 1 | 2 | 3 | 4 | Feeling weak in parts of your body |
| 27. | 0 | 1 | 2 | 3 | 4 | Feeling tense or keyed up |
| 28. | 0 | 1 | 2 | 3 | 4 | Heavy feelings in your arms or legs |
| 29. | 0 | 1 | 2 | 3 | 4 | Thoughts of death or dying |
| 30. | 0 | 1 | 2 | 3 | 4 | Overeating |
| 31. | 0 | 1 | 2 | 3 | 4 | Feeling uneasy when people are watching or talking about you |
| 32. | 0 | 1 | 2 | 3 | 4 | Having thoughts that are not your own |
| 33. | 0 | 1 | 2 | 3 | 4 | Having urges to beat, injure, or harm someone |
| 34. | 0 | 1 | 2 | 3 | 4 | Awakening in the early morning |
| 35. | 0 | 1 | 2 | 3 | 4 | Having to repeat the same actions such as touching, counting, or washing |
| 36. | 0 | 1 | 2 | 3 | 4 | Sleep that is restless or disturbed |
| 37. | 0 | 1 | 2 | 3 | 4 | Having urges to break or smash things |
| 38. | 0 | 1 | 2 | 3 | 4 | Having ideas or beliefs that others do not share |
| 39. | 0 | 1 | 2 | 3 | 4 | Feeling very self-conscious with others |
| 40. | 0 | 1 | 2 | 3 | 4 | Feeling uneasy in crowds, such as shopping or at a movie |
| 41. | 0 | 1 | 2 | 3 | 4 | Feeling everything is an effort |
| 42. | 0 | 1 | 2 | 3 | 4 | Spells of terror or panic |
| 43. | 0 | 1 | 2 | 3 | 4 | Feeling uncomfortable about eating or drinking in public |
| 44. | 0 | 1 | 2 | 3 | 4 | Getting into frequent arguments |
| 45. | 0 | 1 | 2 | 3 | 4 | Feeling nervous when you are left alone |
| 46. | 0 | 1 | 2 | 3 | 4 | Others not giving you proper credit for your achievements |
| 47. | 0 | 1 | 2 | 3 | 4 | Feeling lonely even when you are with people |
| 48. | 0 | 1 | 2 | 3 | 4 | Feeling so restless you couldn't sit still |
| 49. | 0 | 1 | 2 | 3 | 4 | Feelings of worthlessness |
| 50. | 0 | 1 | 2 | 3 | 4 | The feeling that something bad is going to happen to you |
| 51. | 0 | 1 | 2 | 3 | 4 | Shouting or throwing things |
| 52. | 0 | 1 | 2 | 3 | 4 | Feeling afraid you will faint in public |
| 53. | 0 | 1 | 2 | 3 | 4 | Feeling that people will take advantage of you if you let them |
| 54. | 0 | 1 | 2 | 3 | 4 | Having thoughts about sex that bother you a lot |
| 55. | 0 | 1 | 2 | 3 | 4 | The idea that you should be punished for your sins |
| 56. | 0 | 1 | 2 | 3 | 4 | Thoughts and images of a frightening nature |
| 57. | 0 | 1 | 2 | 3 | 4 | The idea that something serious is wrong with your body |
| 58. | 0 | 1 | 2 | 3 | 4 | Never feeling close to another person |
| 59. | 0 | 1 | 2 | 3 | 4 | Feelings of guilt |
| 60. | 0 | 1 | 2 | 3 | 4 | The idea that something is wrong with your mind |

Appendix 2

Attrition Analysis: Subjects Failing to Participate in Phase II
Versus Subjects Participating in Both Phases

Variable Group	<u>N</u>	<u>M</u>	<u>SD</u>	<u>SE</u>	<u>t</u> ^a	<u>df</u>	<u>p</u>
<u>BIDR-6 (Time One)</u>							
Phase I only	49	158.06	21.58	3.08	-0.45	338	0.65
Phase I & II	291	159.60	21.99	1.29			
<u>NPI (Time One)</u>							
Phase I only	49	16.02	6.89	0.98	2.41	338	0.02
Phase I & II	291	13.47	6.84	0.40			
<u>SOCO (Time One)</u>							
Phase I only	49	1287.24	174.24	24.89	-0.15	338	0.88
Phase I & II	291	1291.27	180.61	10.59			
<u>SCL-90-R Global Symptom Index (Time One)</u>							
Phase I only	49	0.97	0.65	0.09	1.34	338	0.18
Phase I & II	291	0.85	0.54	0.03			

^aAssumption of equal variances.

Appendix 3

Order Effects Across Questionnaire Arrangements (Time One)

Variable	Source	df	SS	F	p
<u>BIDR-6</u>					
	Model	2	693.85	0.72	0.49
	Error	288	139599.91		
	Corrected Total	290	140293.76		
<u>NPI</u>					
	Model	2	467.16	5.14	0.01
	Error	288	13097.28		
	Corrected Total	290	13564.44		
<u>SOCO</u>					
	Model	2	43850.07	0.67	0.51
	Error	288	9416105.02		
	Corrected Total	290	9459955.09		
<u>SCL-90-R (Global Symptom Index)</u>					
	Model	2	0.03	0.04	0.96
	Error	288	84.29		
	Corrected Total	290	84.31		

Note. N=291.

Note. Three levels in class variable.

Continued on next page

Appendix 3 (continued)

Order Effects Across Questionnaire Arrangements (Time Two)

Variable	Source	df	SS	F	p
<u>BIDR-6</u>					
	Model	2	200.05	0.23	0.79
	Error	288	123833.17		
	Corrected Total	290	124033.22		
<u>NPI</u>					
	Model	2	92.06	0.38	0.69
	Error	288	16821.05		
	Corrected Total	290	16913.11		
<u>SOCO</u>					
	Model	2	101585.68	1.66	0.19
	Error	288	8810448.90		
	Corrected Total	290	8912034.58		
<u>SCL-90-R (Global Symptom Index)</u>					
	Model	2	0.78	1.27	0.28
	Error	288	88.48		
	Corrected Total	290	89.25		

Note. N=291.

Note. Three levels in class variable.

Appendix 4

Sex Differences (Time One)

Variable	Sex	<u>N</u>	<u>M</u>	<u>SD</u>	<u>SE</u>	<u>t</u> ^a	<u>df</u>	<u>p</u>
<u>BIDR</u>								
	Male	104	156.10	21.34	2.09	-2.04	289	0.04
	Female	187	161.55	22.17	1.62			
<u>NPI</u>								
	Male	104	14.90	6.93	0.68	2.70	289	0.01
	Female	187	12.67	6.67	0.49			
<u>SOCO</u>								
	Male	104	1320.45	203.57	19.96	2.06	289	0.04
	Female	187	1275.04	164.84	12.05			
<u>SCL-90-R (Global Symptom Index)</u>								
	Male	104	0.79	0.48	0.05	-1.45	289	0.15
	Female	187	0.89	0.57	0.04			

^aAssumption of equal variances.

Continued on next page

Appendix 4 (continued)

Sex Differences (Time Two)

Variable	Sex	<u>N</u>	<u>M</u>	<u>SD</u>	<u>SE</u>	<u>t</u> ^a	<u>df</u>	<u>p</u>
<u>BIDR</u>								
	Male	104	150.00	19.01	1.86	-2.65	289	0.01
	Female	187	156.52	21.24	1.55			
<u>NPI</u>								
	Male	104	15.65	7.84	0.77	3.42	289	0.00
	Female	187	12.52	7.30	0.53			
<u>SOCO</u>								
	Male	104	1343.36	179.75	17.63	2.82	289	0.01
	Female	187	1283.61	169.53	12.40			
<u>SCL-90-R (Global Symptom Index)</u>								
	Male	104	0.80	0.52	0.05	-1.46	289	0.14
	Female	187	0.90	0.57	0.04			

^aAssumption of equal variances.

Appendix 5.

Correlations of Error Terms for Figure 1 Model

<u>SDE Error Terms</u>					
	SDE+1	SDE-1	SDE+2	SDE-2	
SDE+1	-				
SDE-1	-.27*	-			
SDE+2	.31*	-.14	-		
SDE-2	-.14	.19	.02	-	

<u>SOCQ Error Terms</u>					
	HD1	LD1	HD2	LD2	
HD1	-				
LD1	.31*	-			
HD2	.60*	.26*	-		
LD2	.21*	.66*	.28*	-	

<u>NPI Error Terms</u>					
	LEAD1	VAIN1	LEAD2	VAIN2	
LEAD1	-				
VAIN1	.37*	-			
LEAD2	.80*	.35*	-		
VAIN2	.40*	.77*	.40*	-	

Note. Coefficients with asterix have test statistics that exceed 2.00 (absolute).