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Absorption, Empathy and Interpersonal Orientation
Measurement Issues and Relationships

by
Margaret de Groh, B.A., M.A.

A thesis submitted to
the Faculty of Graduate Studies and Research
in partial fulfilment of
the requirements for the degree of

Doctor of Philosophy

Department of Psychology

Carleton University
Ottawa, Ontario
September 16, 1991
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Abstract

The three studies presented, though diverse in content, were linked by their focus on Absorption (alternatively termed imaginative or fantasy involvement). Absorption was operationally defined by the Absorption (ABS) scale developed by Tellegen and Atkinson (1974). Study 1 explored whether experiences described in the Absorption scale are best thought of as unidimensionally or multidimensionally related. Both factor analytic results and scalogram analytic results provided support for interpreting at least the majority of ABS items as unidimensionally related. The structure of specific ABS items, in terms of defining a specific context versus maintaining the context as unspecified was also discussed.

Study 2 focused on the relationship of Absorption and hypnotic susceptibility, the area of research within which the ABS scale was developed. Specifically, Study 2 investigated the predictive power and context dependency hypothesis concerning the relationship of Absorption and susceptibility suggested by Councili, Kirsch and Hafner (1984). This study employed a mixed design which allowed both between group and within group assessments for context effects. Within group assessment

for context effects using regressed change analysis, however, indicated that within subject comparisons produced statistically significant, though marginal context effects.

Finally, Study 3 investigated the predictive power of the ABS scale in other areas of research where notions of Absorption or imaginative involvement have been introduced. Results indicated that the strength of the relationship of the ABS scale was "as good" if not slightly better than more restrictive measures of involvement (i.e., Davis' Fantasy scale; Absorption factors from Study 1) with respect to measures of other-orientation (i.e., Interpersonal Sensitivity), Empathic Concern (and related measures) and Private Self-Consciousness.

In Study 3, Absorption also demonstrated a joint relationship with Interpersonal Sensitivity (i.e., other-orientation) when predicting Empathic Concern. Results indicated that for subjects higher on Interpersonal Sensitivity, Absorption was unrelated to Empathic Concern. Contrary to expectations, however, Absorption showed a small positive relationship to Empathic Concern for lower Interpersonal Sensitivity subjects, though Absorption failed to enhance predicted Empathic Concern scores to the level observed for higher Interpersonal Sensitivity subjects.

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Introduction

In 1974 Tellegen and Atkinson introduced the development of a scale they considered to measure a "new" construct or dimension of personality which they labelled "Openness to Absorbing and Self-Altering Experiences" or Absorption. Tellegen and Atkinson argued that the common cognitive-motivational process underlying Absorption items included in their scale is one of, "...total attention', during which the available representational apparatus seems to be entirely dedicated to experiencing and modeling the attentional object, be it a landscape, a human being, a sound, a remembered incident, or an aspect of one's self (p. 274)." It should be noted that a full representational system, according to these authors, precludes qualifying (i.e., analytical) thoughts about the experience (such as, "this is only my imagination"; see Tellegen & Atkinson, 1974).

It is important to realize that Tellegen and Atkinson developed the Absorption scale within the context of hypnosis theory. Within this area, researchers for decades had attempted to identify those involvements (i.e., experiences) in the lives of individuals that meaningfully predict hypnotic responsiveness (e.g., As, 1963; J. Hilgard,

1979; Lee-Teng, 1965; Shor, Orne & O'Connell, 1962). Work in this area had suggested that hypnotic responding is best predicted by "experience" items that reflect the process of elaborating on "make believe" situations, while reinterpreting or failing to reflect upon information that contradicts the reality status of the make-believe situation (see J. Hilgard, 1979; O' Grady, 1980; Spanos, Brett, Menary & Cross, 1987; Shor, 1970;). It is this process that is often considered necessary for successful hypnotic responding (see Spanos & Barber, 1974 for a review). Of particular interest here, however, is that the tendency to engage in this process, alternatively termed imaginative involvement, fantasy involvement or absorption levels, has been considered a stable "trait-like" attribute of the individual (e.g., Shor, 1970; J. Hilgard, 1979; O'Grady, 1980; Tellegen & Atkinson, 1974).

Drawing heavily on the research of hypnosis theorists, Tellegen and Atkinson's initial item pool for the Absorption scale included predominately "experience" items that had previously been associated with hypnotic susceptibility. Nevertheless, their results suggested to the authors that the content of the Absorption scale "...exemplifies the combination of *substantive divergence* and *structural convergence* that

is suggestive of a major dimension or, in Eysenck's terms a "combinatorial" trait (p. 273; Tellegen & Atkinson, 1974)." The variety of attentional objects reflected by some Absorption scale items underscores Tellegen and Atkinson's notion that it is the underlying process of absorbed attention that unifies the scale. Since the scale is treated as unidimensional (i.e., summing across experience items), the diversity of attentional objects to which an individual applies this process presumably determines their level of the "trait" Absorption.

The content of the Absorption scale, however, appears to extend the range of experiences researchers in other areas (i.e., other than hypnosis) have used to represent what seems to be the same involvement process. For example, in attempting to link involvement in absorbing (versus rational) experiences to the degree of "femininity" and "masculinity" demonstrated by individuals, Hirschman (1985) developed a measurement of absorption that appears similar to only a subset of Tellegen and Atkinson's Absorption items. Specifically, some Absorption items would probably demonstrate a high degree of convergence with Hirschman's operational definition of an absorbing experience, such as, "When listening to music, I can get so caught up in

it that I don't notice anything else.". Hirschman's operational definition of absorption, however, did not reflect other items on the Absorption scale (e.g., "If I wish I can imagine that my body is so heavy that I could not move it if I wanted to"; "I often know what someone is going to say before he or she says it").

In another research area, Stotland and his associates have suggested that, "...the dimension of fantasy or the ability to transplant oneself by imagination into another setting is an important contingency for the process of empathy (p. 42; Stotland, et al., 1978)." High fantasizers, for example, may be more adept at taking the role of an other and, consequently, feeling the emotions an other feels (i.e., empathy; see Stotland, et al., 1978). The process of absorption would appear to be implicit in Stotland's definition of fantasy involvement. Empathy theorists, however, have also restricted their operational definition of fantasy involvement to the degree that individuals report putting the self in the perspective of an other, such as becoming the character in a play, novel or movie.¹ Experience items used to denote fantasy involvement in this area also overlap with only a small subset of Absorption items.

Major Considerations

One of the primary interests of this research project was the generalizability of the Absorption scale to these other areas of research. As might be expected, the theoretical focus of empathy theorists' has restricted the range of experiences that they employ to operationally define fantasy involvement. If absorption (or imaginative involvement levels) is to be considered an important personality dimension, however, then the Absorption scale, with its more varied range, should emerge as a more reliable predictor in areas where a similar aptitude has been hypothesized. Conversely, restricting the context of one's involvement (e.g., to an "other" as the attentional object) does have some intuitive appeal and is consistent with recent suggestions that the Absorption scale may have meaningful and divergent subcategories of experiences (i.e., is multidimensional; see de Groh, 1989; Ronnestad, 1985). Therefore, the internal properties as well as the generalizability of the Absorption scale have been investigated in this thesis.

Findings concerning the structure of the Absorption scale (i.e.,

unidimensionality vs. multidimensionality) were taken into consideration when investigating the interrelationship of absorption (or involvement levels) with empathy levels and what has been traditionally defined as "masculinity" and "femininity" levels. One major departure from the work of others (e.g., Hirschman, 1985), however, has been the rejection of the constructs, masculinity and femininity, as ill-defined and imprecise. Rather, an alternative interpretation that allows a smoother integration of these three research areas has been offered. Specifically, revised subscales from Bem's Sex-Role Inventory (based on the work of Pedhazur and Tetenbaum, 1979) were used as proxy variables for the degree to which an individual actively engages in "self" and "other" oriented behaviour. Gilligan (1982) has suggested that the interpersonal orientation of an individual (i.e., other and/or self) greatly influences their interpretation of an interpersonal situation and, by extension, influence their responses to that situation. The perspective one adopts (either self and/or other) may provide an important link between levels of fantasy involvement and the expression of other oriented behaviour, such as empathy. Specifically, interpersonal

orientation may mediate the relationship between these two variables, with fantasy levels intensifying the empathic experience of other oriented individuals. Alternatively, Stotland has suggested that high levels of fantasy involvement may act as a catalyst in the development of an other oriented perspective. It is not presumed that this project will allow one of these alternative interpretations to emerge as superior. It is hoped, however, that the methodological issues to be addressed will result in a clearer representation of the constructs involved and their interrelationships.

Absorption Scale: Historical Context

In a persuasive article, Spanos and Barber (1974) showed that *involvement in suggestion-related imaginings* was at the core of both state and nonstate theories of hypnotic responsiveness. For many state and nonstate theorists, successful hypnotic responding is seen as requiring a shift in perspective away from an alert "reality oriented" frame of reference (Arnold, 1946; Barber, 1970b; Sarbin, 1950; Sarbin & Coe, 1972; Shor, 1970; Spanos & Barber, 1974). Those who successfully respond to hypnotic suggestions are viewed as

disregarding information that is inconsistent with the aims of a hypnotic suggestion, while at the same time sustaining and elaborating on imaginings that are consistent with the aims of a suggestion. According to Spanos and Barber these two processes in actuality are, "...two sides of one unitary psychological process...the process of sustaining imaginings necessarily implies the complementary process of ignoring or disregarding inconsistent and irrelevant information (p. 501, Spanos & Barber, 1974)." This process they referred to as imaginative involvement.

Hypnosis researchers have devoted considerable energy to identifying other contexts (i.e., other than hypnosis) within which individuals may engage in involved imaginings (Ås, 1963; Hilgard, 1979; Lee-Teng, 1965; Shor, Orne & O'Connell, 1962). It has been reasoned that an individual's tendency to engage in this process in everyday life represents a stable attribute or skill that is necessary and, therefore, should be predictive of successful hypnotic responsiveness.

Shor and his associates were among the first researchers in this area who attempted to identify those everyday experiences

associated with hypnotic susceptibility. The original experience categories from which Shor and his associates drew their item pool were quite diverse (Shor, Orne & O'Connell, 1962; see Table 1). Shor reasoned that experience items found to correlate with susceptibility levels may do so because both sets of experiences require the same underlying processes. Item selection for Shor's Personal Experience Questionnaire (PEQ; Shor, et al., 1962) was based on the magnitude of the zero-order correlation between each experience item and susceptibility. Consequently, scoring of the PEQ summed across experience items, regardless of content. Subsequent use of the PEQ, however, failed to demonstrate a stable relationship with susceptibility (Barber & Calverley, 1965; Bowers, 1971; London, Cooper & Johnson, 1962; Nowlis, 1969).

Ås (1963) adopted the same procedure of by-item correlations with susceptibility scores in his attempt to "purify" his 60-item Experience Inventory. Ås hoped to find a subset of items that produced a stronger relationship with susceptibility than the low correlation magnitudes associated with overall scores on the EI ($r=.36$, $N=50$ females; $r=.31$, $N=52$ females). The best subset of

Table 1. Personal Experience Questionnaire (From Shor, Orne & O'Connell, 1962; p. 58).

Topic Areas/Overlapping Categories

- a) The activities of sleeping or preparing for sleep.
- b) The characteristics of dreams or dreaming.
- c) The ability to concentrate and to achieve a quieting of mental activities.
- e) Naturally occurring trance experiences.
- f) Suggestibility in everyday life situations.
- g) Temporary loss of awareness of generalized reality when mentally absorbed or preoccupied.
- h) The extent of deliberate control of attentional processes.
- i) Sensory illusions in waking and hypnagogic states.
- j) Amnesias, absentmindedness, or unusual forgetting in everyday life.
- k) Naturally occurring illusions and hallucinations.
- l) The extent to which an imaged or pseudo-reality has ever become temporarily indistinguishable from the actual reality.
- m) Artistic, mystical, transcendental, and profound religious experiences with altered consciousness.
- n) Detachment, depersonalization and estrangement from self or reality.

Illustrative Examples*

- a) Have you ever had part of your body look strange and not part of your body at all?
- b) Have you ever found yourself staring at something and for the moment forgotten where you were?
- c) Do you ever get seasick at ocean movies?
- d) Have you ever had the experience of walking in your sleep?
- e) Have you ever felt drunk while sober?
- f) Have you ever become so absorbed in listening to music that you almost forgot where you were?
- g) Have you ever felt a oneness with the universe, a melting into the universe, or a sinking into eternity?
- h) Have you ever been able to ignore pain?
- i) Do you ever get unusually sleepy when reading dull material?
- j) Has everything in your line of vision become blurry or strange, as if you were dreaming?
- k) Do you find yourself unwittingly adopting the mannerisms of other people?
- l) Have you ever had the experience of seeming to watch yourself from a distance as if in a dream?

*Order of Topic Areas do not necessarily correspond to the order of Illustrative Examples

experience items was ascertained for the two samples of female subjects. Of the original 60 items, only 16 in the first sample and 17 in the second sample were positively correlated with susceptibility beyond the 10% level of statistical significance. Although the correlations between susceptibility and summed subsets of items were significantly enhanced within the sample from which they were selected, when applied to their respective "replication" samples, the correlations dropped significantly and fared no better than total EI scores. In fact, Hilgard (1965) reported that when the subset of "poor" predictors within a particular sample was correlated with susceptibility in the replication sample, correlation magnitudes rivaled the subset of "good" predictors.

Given these results, Ås (1963) suggested that to produce a significant relationship between susceptibility and subjective experience items from sample to sample required an inventory covering a broad range of experiences. The instability of Ås' smaller subsets, however, may have more to do with his use of by-item correlations as the criterion for item inclusion. The reliability of the relationship of any one experience item to susceptibility is

questionable. Therefore, it is not surprising that experience items appeared "unstable" by significantly correlating in one sample, but failing to significantly correlate in another sample (see Ås, 1963). The reliability of a smaller subset of items may have been enhanced by summing together conceptually related "experience" items. Many of the experience items which correlated in at least one of Ås' samples could be classified under one of the two theoretical dimensions that Ås and his associates deduced from factor analysing a subset of EI items (Ås, O'Hara & Mungar, 1962). Moreover, according to their factor analytic results, these two dimensions, labelled Role Absorption and Tolerance for Unusual Experiences appeared conceptually distinct (i.e., orthogonal). Ås' (1963) objective of a reliable subset of experience items may have been achieved if he had, for example, summed together Role Absorption items. This approach, the logical step after the factor analytic findings of Ås, et al. (1962), was not pursued.

Development of the Absorption Scale

Much of the work just described formed the foundation for

construction of the Absorption scale. Tellegen and Atkinson (1974) started with a set of 71 items which covered a wide range of experiences and attitudes. Thirty of the items were borrowed from previous experience inventories. These items were included because their relationship with susceptibility was found to be statistically significant (e.g., Ås, 1963; Lee-Teng, 1965). Another 18 items were selected from Roberts and Tellegen's (1973) "Trust Rating Scale" (again inclusion was based on correlations with susceptibility). The remaining 23 items were new.

The development of the original Absorption scale involved two important stages. In the first stage, the dichotomous (i.e., true/false) responses of 481 female subjects to the original 71 items were factor analysed. Tellegen and Atkinson interpreted 11 factors (the number of items included within each factor was not reported; the authors stated, however, that only factors with at least two items were interpreted). These 11 factors are listed in Table 2. Tellegen and Atkinson found that many of the items exhibited nontrivial loadings on more than one factor. Items were included within a particular factor based on their highest loading. It is

Table 2. Development of the Absorption Scale (From Tellegen & Atkinson, 1974; pp. 270-271).

Subscales and Illustrative Examples

- 1) ***Reality Absorption*** (a tendency to become immersed in movies, acting, nature, voice, past events, etc.):
 - The sound of a voice can be so fascinating to me that I can just go on listening to it.
 - I can sometimes recollect certain past experiences in my life with such clarity and vividness that it is like living them again or almost so.
- 2) ***Fantasy Absorption:***
 - If I wish, I can imagine (or daydream) some things so vividly that they hold my attention in the way a good movie or story does.
 - I am sometimes able to forget about my present self and get absorbed in a fantasy that I am someone else.
- 3) ***Dissociation:***
 - If I wish, I can imagine that my body is so heavy that I could not move it if I wanted to.
- 4) ***Sleep Automatism:***
 - I know that at some time I have walked in my sleep.
- 5) ***Openness to Experience:***
 - I enjoy, or would enjoy, getting beyond the world of logic and reason to experience something new and different.
- 6) ***Devotion and Trust:***
 - It gives me, or would give me, deep satisfaction to devote myself to someone I care about.
- 7) ***Autonomy-Skepticism:***
 - I would much rather stick to my own ideas than be guided by others.
- 8) ***Optimism-Placidity:***
 - Regardless of what happens around me, I stay and feel pretty much the same.
- 9) ***Aloofness-Reserve :***
 - I prefer not to "open up" much, not even to friends, but to maintain a certain distance.
- 10) ***Caution vs. Impulsiveness:***
 - When faced with a decision I usually ponder and weigh all aspects carefully.
- 11) ***Relaxation:***
 - When I want to take a nap during the day, I can make myself go to sleep in very little time.

important to keep in mind that Tellegen and Atkinson's primary objective was to demonstrate a higher order structure among these 11 factors. The authors, therefore, reasoned that if particular sets of items exhibited systematic loadings across factors, further analysis would allow a higher order structure to emerge.

The second stage of Tellegen and Atkinson's scale development involved a second factor analysis. This analysis included 13 scores for each subject, the eleven factors outlined in Table 2 (items defining a factor were summed for each subject), plus two other scales, Block's Ego Resiliency and Block's Ego Control (see Tellegen & Atkinson, 1974). The results for two separate samples of female subjects (Sample 1, N=142; Sample 2, N=171) were almost identical. Three factors emerged with six of the original 11 summed factor scores showing moderate to high loadings on only one factor. The two other factors, one dominated by the Ego Resiliency scale and the other dominated by the Ego Control scale, each contained two of the original 11 factors. Sleep-Automatism (see Table 2) failed to load on any of the factors, a finding that is consistent with previous factor analytic results (see Ås, et al., 1962).

In their original article Tellegen and Atkinson (1974) described absorbed experiences as episodes of "total" attention during which the individual devotes "...full commitment of available perceptual, motoric, imaginative and ideational resources to a unified representation of the attentional object (p. 274)." It is the presence of this process that presumably unifies items on the Absorption scale. Theoretically, Tellegen and Atkinson did not place any restriction on the properties of the attentional object toward which the individual may apply her or his representation system. After Tellegen and Atkinson's original publication, Tellegen (1976) expanded the Absorption scale in conjunction with a larger personality inventory, the Differential Personality Questionnaire (DPQ). This questionnaire contains 300 items, and 16 subscales of which the Absorption scale is just one.² In his description of the Absorption subscale, however, Tellegen (1976) emphasized the specific contexts of a subset of Absorption items. Individuals high on the absorption scale were described as responsive to music, art and nature. Tellegen also suggested that these individuals were more likely to become involved in imaginative experiences and fantasy (Tellegen, 1976).

Consistent with this description, the Absorption scale has demonstrated a moderate association with scales measuring daydreaming (Crawford, 1978; 1982) and fantasy-proneness (Lynn & Rhue, 1986). The Absorption scale has also demonstrated divergent validity by failing to significantly correlate with traditional personality variables as well as measures of psychopathology (e.g., O'Grady, 1980; Tellegen & Atkinson, 1974; Spanos & Moretti, 1988; Spanos, Stam, et al., 1976).

The Absorption scale, however, has also demonstrated a moderate association with such variables as mysticism (Spanos & Moretti, 1988), vividness of imagery (Crawford, 1982; Hilgard, et al., 1981; Spanos, Stam, Rivers & Radtke, 1980) as well as attitudes and expectancies toward hypnosis (Council & Kirsch, 1983; Council, Kirsch & Hafner, 1986; Spanos, Brett, et al., 1987; Spanos, McPeake & Churchill, 1976). Moreover, it has been shown to load with imagery vividness and hypnosis-specific attitude variables in factor analytic studies (Spanos, Pawlak, D'Eon, Mah & Ritchie, 1980; Spanos, Rivers & Gottlieb, 1978). These studies are not devoid of methodological problems, the most serious being small mixed gender sample sizes. The results, however,

have been consistent.

Tentative support for the existence of divergent Absorption subscales comes from the work of Ronnestad (1985) who first content analysed and then factor analysed the Absorption scale. Ronnestad's content analysis resulted in four subscales. These four subscales, along with his illustrative examples are listed in Table 3. Ronnestad tested his hypothesis of four subscales by factor analysing responses to the Absorption scale's 34 items, with the restriction of four factors. Each of the theoretically derived subscales correlated $r=.70$ or above with only one of the empirically derived subscales. All the theoretical subscales produced moderate to low correlations with the other three empirically derived subscales.

Unfortunately, intercorrelations among the factor analytic subscales were not reported. Further, while the degree of convergence between a particular rational and empirical subscale was respectably high ($r > .70$) they were obviously not perfect. Ronnestad did not address these discrepancies and went on to use his rationally derived subscales in subsequent analyses. Finally, the generalizability of these results are open to question. The most obvious concern is that Ronnestad first

Table 3. Subscales Suggested by Ronnestad (1985) for the Absorption Scale.

Categories and Illustrative Examples

1. *Affective/Regressive* (13 items)

- I can sometimes recollect certain past experiences in my life with such clarity and vividness that it is like living them again or almost so.
- I can be deeply moved by a sunset.
- I can be greatly moved by eloquent or poetic language.

2. *Cognitive/Perceptual Engagement* (10 items)

- If I stare at a picture and then look away from it, I can sometimes "see" an image of the picture, almost as if I were still looking at it.
- My thoughts often don't occur as words but as visual images.

3. *Dissociative* (6 items)

- I sometimes "step outside" my usual self and experience an entirely different state of being.
- If I wish I can imagine that my body is so heavy that I could not move it if I wanted to.

4. *Mystical Inclination* (5 items)

- At times I somehow feel the presence of someone who is not physically there.
- I often know what someone is going to say before he or she says it.

hypothesized four subscales and then carried this restriction over into his empirical analysis. The possibility of a more parsimonious factor structure was not investigated.

The results of prior research, however, suggest that Ronnestad's subscales may have some validity. For example, items constituting Ronnestad's Cognitive Perceptual subscale suggest that a portion of the Absorption scale may be tapping an imagery vividness component. According to Ronnestad, almost one-third of the Absorption items fall into this category. Although some researchers have suggested that vivid imagery is necessary for deep "affective" involvement (e.g., Sheehan, 1979), this hypothesis has not been systematically tested. In addition, in a factor analysis reported by Ås, et al. (1962), two factors (labelled Role-Absorption and Tolerance for Unusual Experiences) show similarities to Ronnestad's Affective/Regressive and Mystical subscales (respectively). Ås, et al. reported their two factors to be orthogonal. Taken together, the available results suggest a degree of independence may exist among prospective subscales that is not trivial.

That the Absorption scale may contain subcategories (or subfactors) is by no means inconsistent with Tellegen and Atkinson's (1974) original

findings. In fact, their objective of demonstrating a higher order structure among their primary factor scales leaves open this possibility.

These authors, however, did not consider the Absorption scale to be multidimensional, and also did not rigorously test this possibility.

Instead, they envisioned that a unidimensional trait-like attribute was being measured when responses to Absorption items are summed together. The primary focus of Study 1 will be on attempting to help clarify the interrelationship of Absorption items through the use of factor analytic and multidimensional scaling techniques. It was hoped that specific results would also help clarify interpretations concerning the process underlying Absorption.

The Process Underlying Absorption

The process Tellegen and Atkinson suggested underlies Absorption items (i.e., "total" attention) is quite similar to the process of "sustaining and elaborating on imaginings" (i.e., imaginative involvement) that Spanos and Barber (1974) suggested underlies responses to hypnotic suggestions. Spanos and Barber, however, stressed that the process of imaginative involvement is necessarily preceded by a cognitive shift in

orientation away from one's alert "reality oriented" frame of reference (see Arnold, 1946; Sarbin, 1960; Shor, 1970; Spanos & Barber, 1974). Shor (1970) has described this process as a fading of one's Generalized Reality Orientation; a fading of the rules or implicit assumptions about the world that constitute a framework for categorizing and interpreting ongoing experiences. Tellegen and Atkinson (1974) did allude to this cognitive shift when they stated:

"It is assumed that an already fully engaged representational system cannot, in addition to representations of the focal objects, maintain salient qualifying "meta-cognitions", that is, thoughts *about* the primary representation, such as "this is only my imagination" or " this is not really happening" (p. 274, emphasis original)."

One issue that Tellegen and Atkinson did not consider, however, is that a more extensive "suspension of society's rules and assumptions" may be required for some experience items but not for others. Consider as an analogy that some hypnotic suggestions are more difficult to execute (i.e., "pass") than others. Several investigators (Barber, Spanos & Chaves, 1974; Shor, 1970; Tellegen, 1979) have suggested that hypnotic

suggestions require the suspension of thoughts that are incongruent with treating one's imaginings during the suggestion "as if" they were real. Hypnotic suggestions, however, may generate different degrees of incongruence. According to Tellegen, highly incongruent suggestions, "...require that the subject generate imaginative experiences in the presence of some highly discrepant and salient external or internal reality inputs (p. 226; Tellegen, 1979)." Absorption items may also differ in the degree to which the experiences suggested are incongruent with what Tellegen terms external and internal reality inputs (treated by Tellegen as synonymous with the rules of Shor's GRO).

Suspension of belief or degree of incongruence may be an important dimension that orders some Absorption items. Furthermore, like hypnotic suggestions, where the successful execution of more difficult suggestions usually indicates that the subject also successfully "passed" easier suggestions, those who respond affirmatively to "difficult" Absorption items may also do the same to "easier" Absorption items. In other words, items or "subfactors" may exhibit scalability.

Study 1

One of the primary interests of Study 1 was to investigate whether the relationship of Absorption items is unidimensional or multidimensional. Factor analytic and multidimensional scaling techniques were used to explore the internal structure of the Absorption scale. The specific method used to explore the relationship of items at each stage, however, had some important differences from Tellegen and Atkinson's original scale construction. For example, Tellegen and Atkinson's original factor analysis was executed on dichotomous data. It was, therefore, decided to extend the range of possible responses to each Absorption item. A four point Likert-type scale was adopted ranging from "Never" (1) to "Very Frequently" (4) for each experience item. This approach was adopted, in part, because of the potential problems encountered when factor analyzing dichotomous data (see Comrey, 1978; Comrey & Levonian, 1958). Some of these problems were suggested in a pilot factor analysis of the Absorption scale (using Tellegen and Atkinson's original scoring). The preliminary correlation matrix revealed intercorrelations among Absorption items that were uniformly low, suggesting that the data were not suitable for factor analysis. Instead

of concluding that items on the scale were unrelated, it was hoped that a broader range of possible response to Absorption items would allow the potential convergence among experience items to emerge. It should be noted that, other things being equal, this extended range increases the probability of finding a divergent factor structure. This caveat will be kept in mind when analysing the results.

The approach of Study 1 also stressed the development of highly stable factors. As a result, only a subset of Absorption items was used in the final stages of the study. In their study, Tellegan and Atkinson attempted to include all items in their analyses and ignored low item loadings during initial factor analyses. It was felt that stable factors would provide a clearer picture of the interrelationship among factors. Since the factor analytic approach in this study was also considered exploratory, factor solutions were not expected to use all Absorption items³.

To investigate the unidimensional versus multidimensional relationship of the Absorption items, two samples of subjects were used. One sample, defined as the Criterion sample, was gathered during the Psychology 100 mass testing session conducted during the fall of

1987. The second sample, defined as the Replication sample, was gathered in conjunction with Hypnotic Susceptibility testing during the 1986/87 academic school year. Subjects in this sample completed the Absorption scale just prior to susceptibility testing.

The decision to designate the mass testing sample as the criterion sample was based on two considerations. First, the sample sizes for males ($n=256$) and females ($n=258$) were much larger in comparison to the number of subjects available from the hypnosis sessions (females, $n=144$; males, $n=88$). The sample sizes for both males and females in the mass testing session allowed initial exploratory analyses on all 34 Absorption items to proceed with a more acceptable subject to variable ratio. Also, it was anticipated that attempts to develop a stable factor structure would require dropping some Absorption items from subsequent exploratory factor analyses with the Criterion sample. It was, therefore, expected that the final factor solution to be applied to the Replication sample would involve a smaller number of Absorption items, thus allowing for a more acceptable subject to variable ratio for replication analyses.

The second consideration when designating criterion and replication

samples was context. It was deemed inappropriate to use Absorption responses gathered during a hypnosis session for the criterion sample in light of recent controversy concerning the relationship between Absorption and susceptibility scores. Results for a number of recent studies have (e.g., Council, Kirsch & Hafner, 1986; de Groot, Gwynn & Spanos, 1988) suggested that the relationship between Absorption and susceptibility may be context dependent (this issue will form the basis for Study 2). These studies have found that when Absorption was measured prior to susceptibility testing and outside the hypnotic context, the relationship between Absorption scores and susceptibility scores was not statistically significant. Council, et al. have suggested that subjects' awareness of their Absorption scale scores alters their expectations for hypnotic responsiveness which, in turn, are the primary determinate of hypnotic responding. Alternatively, if one assumes a context dependent relationship, it may be that it is the hypnotic context that alters some individual responses on the Absorption scale (i.e., alters the salience and interpretation of Absorption items) thereby increasing the consistency of responses with subsequent susceptibility levels. Given the potential influence of the hypnotic context, as well as sample

size considerations, the mass testing sample was designated the Criterion sample. It should be noted that a stable factor structure from criterion to replication sample in this study may provide support for Tellegan and Atkinson's assumption that Absorption represents a stable tendency of the individual. It was decided, a priori, to investigate the dimensionality of the Absorption scale separately for males and females. This approach was adopted primarily because Tellegan and Atkinson's original results were generated using only female subjects.

Method-Study 1

Subjects and Procedure

In order to investigate the internal properties of the Absorption scale, Study 1 included a criterion sample and a replication sample. The criterion sample for Study 1 was gathered at the beginning of Carleton University's 1987-88 academic school year. Only subjects with English as their first language were included. Two hundred fifty-eight females and 256 males who met this criterion responded to the Absorption scale.

The replication sample consisted of 144 females and 82 males whose responses to the Absorption scale were gathered during Carleton

University's 1986-87 academic year⁴. All of these subjects volunteered to participate in a hypnosis session. The Absorption scale was one of several questionnaires these subjects completed prior to being administered a hypnotic induction. Subjects in the replication sample received course credit for their participation.

Materials

Both samples for Study 1 responded to Tellegen's (1976) 34-item extension of Tellegen and Atkinson's original 20-item Absorption Scale. The Absorption scale was also modified from a True/False response format to a 4 point scale format ranging from 1 (Never) to 4 (Very Frequently) for each experience item. All items are scored in the same direction. A copy of the Absorption scale is included in Appendix A.

Results - Study 1

Preliminary Considerations: Criterion Sample

Missing Values. Inspection of subjects' responses on the Absorption scale revealed that 18 females and 19 males failed to respond to at least one of the 34 item. The number of missing values for

most subjects was small. Two male subjects, however, failed to respond to more than 4 Absorption items (15% of the total number of items). It was decided to drop these subjects from further analyses.

For those subjects with a small number of missing values, mean values for items were substituted. Mean value substitutions were determined separately for males and females (e.g., the group mean for females on a particular item was substituted when the subject missing that value was female).

For most items on the Absorption scale nonresponse appeared to be random (i.e., most items had no more than 3 missing values for the entire sample). For two items on the scale (A5 and A11; see Appendix A), however, subjects exhibited a higher proportion of nonresponse than for other items on the scale (8 and 6 missing values, respectively). Question marks and comments on the actual questionnaires suggested that some subjects were unclear on how to interpret these items. Despite the slightly higher proportion of missing values for these two items, they were not dropped from further analyses.

Out-of-Range Values. In an attempt to conserve raw materials by reducing the number of pages comprising the Absorption scale, the

scale for each item was presented to mass testing subjects in the following format (see also Appendix A):

Never 1 2 3 4 Very Frequently

Although the Absorption scale also contained clear directions concerning the correct interpretation of the scale's format (see Appendix A), some subjects effectively changed the range of the scale by circling the words Never or Very Frequently instead of the values associated with these anchors (i.e., 1 or 4 respectively). The presentation format of the Absorption scale to mass testing subjects resulted in 21 females and 24 males with out-of-range values.

Inspection of subjects with out-of-range values indicated that circling the word "Never" was primarily responsible for out of range values. Simply dropping these subjects from further analysis was considered unacceptable because of the relatively large number of subjects and concerns that many of these subjects may have represented the lower end of the distribution for the Absorption scale. To investigate whether out-of-range subjects were over-represented at the lower end of the Absorption distribution, a comparison of subjects with

and without out-of-range values was performed (for this analysis, out-of-range values were recoded to conform to the 1 to 4 scoring scheme) was performed.

To make this comparison, separate t-tests were performed for males and females. Results indicated that out-of-range females did exhibit a statistically significant lower mean value on the Absorption scale than did females without out-of-range values. The pattern of results for out-of-range males and males without out-of-range values was similar to the results for females, but was not statistically significant. It was decided to retain out-of-range subjects with out-of-range values recoded to conform to the 1 to 4 scoring scheme.

Absorption Scale: Correlation Matrix. Inspection of the correlation matrices for males and females indicated a substantial number of bivariate correlations greater than $r=.30$. For females, 48% of the correlations in their Absorption correlation matrix were greater than .30, with the highest correlation observed being .51. For males, 39% of the correlations in their Absorption correlation matrix were greater than .30, with the highest correlation observed being .518. Unlike the dichotomous scoring scheme traditionally adopted for Absorption items

(i.e., True/False), the extended range adopted in this study appeared to have produced a correlation matrices suitable for factor analysis.

Description of Variables. Appendix (B-1) contains the means, standard deviations, and coefficients of skewness for all 34 items comprising the Absorption scale. Males and females responses revealed both positively and negatively skewed variables (statistically significant skewness at $p < .01$). This finding suggested that the frequency rate of positive responses varied across variables. For males, 9 items were positively skewed and 2 variables were negatively skewed. For females, 9 variables were positively skewed and 5 items were negatively skewed. For the most part, the same items were positively skewed (i.e., more "difficult") in both male and female samples. Results suggested, however, that the frequency of negatively skewed variables (i.e., "easier" Absorption items) was slightly higher for females than for males (see Appendix B-1). No variable transformations were adopted. Rather, the influence distributions may have on the interrelationship of variables was taken into consideration when interpreting subsequent factor analytic results.

The squared multiple correlations of each Absorption item with all

other items (SMCs) are listed in Appendix B-2. The majority of SMCs for both males and females were $> .40$. Squared multiple correlations ranged from .22 to .62 for females and from .29 to .52 for males. Results did not suggest the presence of multicollinearity among variables in either female or male samples.

Principal Components Analysis

As an initial step toward a final factor analytic solution, Tobachnick and Fidell (1983; see also Gorsuch, 1974) have recommended using Principal Components Analysis (PCA) to identify case and variable outliers. These authors also recommend using PCA results to guide to preliminary estimates of the number of factors to be extracted. Therefore, separate PCA analyses were conducted for males and females to identify case and variable outliers. The BMDP-4M program was used with varimax rotation.

Case Outliers. To identify multivariate outliers with respect to Absorption items, mahalanobis distances (evaluated as X^2_s) were calculated for males and females separately. With an $\alpha = .01$ cutoff level, 13 females and 12 males were identified as case outliers and

excluded from subsequent factor analyses. The factor analytic results for the Criterion Sample, therefore, were based on responses from 245 females and 242 males.

Variable Outliers. Previous factor analytic attempts (e.g., Ronnestad, 1985) have "forced" the use of all Absorption items when developing subscales. One of the objectives of this study was to identify relatively stable clusters of Absorption items and to explore the interrelationship of these clusters. Given this approach, it was considered appropriate to identify those variables degrading or failing to contribute to PCA solutions.

Considerations for dropping particular Absorption items were low communalities, item loading complexity, factor interpretability and/or complexity in the wording of the item itself. Based on initial PCA results for males and females, 5 variables (see Appendix B-3) were identified and dropped from further exploratory analyses. It should be noted that there were other items that met at least one of these criteria. For example, of the remaining 29 items, 45% of these items for females and 34% of these items for males exhibited loadings $> .35$ on more than one factor. Given previous research results, however, it was expected

that the factors emerging for the Absorption scale would be correlated and that oblique rotation to a final solution would be appropriate.

Consequently, "complex" items that appeared to be contributing to a potential factor for either males or females were retained at this stage.

Number of Factors. The initial unrotated PCA analyses extracted 7 components for females and 8 for males with eigen values greater than 1. To ease initial factor estimations, female and male PCA solutions were orthogonally rotated using Varimax rotation. Only principal components with at least 3 variables (loading > .40) were considered for interpretation. The pattern of variable loadings using these criteria suggested an initial estimation of 6 factors for both males and females. It should be noted that unrotated PCA solutions indicated that all but 1 variable for males and all but 3 variables for females produced loadings $\geq .45$ on the first principal component. It was only after rotation that separate components emerged.

Factor Analyses: Criterion Sample

The process of identifying stable and reliable subfactors from the Absorption scale involved two stages of analyses. At Stage 1, outlier

variables were omitted (see above) and the remaining 29 Absorption items were factor analysed. At Stage 2, only those variables which appeared to contribute to a stable solution at Stage 1 were factor analysed. For all analyses BMDP4M's maximum likelihood common factor solution was used. This method of extraction has been recommended by numerous researchers (e.g., Gorsuch, 1974; Tabachnick and Fidell, 1983; BMDP Manual, 1985). Unlike other extraction methods, maximum likelihood assumes sample statistics are involved and centers on generating the best estimates of population factor loadings. Gorsuch (1974) warns, however, that other things being equal (e.g., variables, number of factors), maximum likelihood solutions may produce a more degraded reproduced correlation matrix than other solutions. This warning was taken into consideration when interpreting results, particularly at Stage 1.

Stage 1. At the first stage, the number of factors requested was varied and the different factor solutions for the remaining 29 variables were considered. Preliminary Stage 1 analyses suggested correlated factors, and that oblique rotation to a solution was more appropriate than forcing factors to be uncorrelated. The BMDP manual's recommended

procedure of oblique rotation (DQUART) was used, with gamma set at 0.

Interpretability (and stability) of the factors, as well as examination of the residual correlation matrix, were used as guides for determining the appropriate number of factors. Examining the magnitude of residual matrix values (the difference between the original and reproduced correlation matrix) has been suggested as a guide to determining the appropriate number of factors. Some researchers have suggested that if all residual matrix values are $< .1$, the original correlation matrix has been sufficiently reproduced (e.g., Gorsuch, 1974; Tabachnick and Fidell, 1983). Generally, the presence of residual matrix values greater than .1 indicate that more factors may have to be extracted. At this preliminary stage, attempts were made to minimize residuals, but at the same time to maximize reliability and interpretability of factors.

The 5 factor oblique solutions for males and females produced 4 interpretable factors common to both groups. The Pattern and Structure matrices for males and females are presented in Appendix (B-4). Seven iterations to a solution were necessary for males and 4 iterations to a solution were necessary for females. Inspection of the residual

correlation matrix for males revealed 6 residuals $> .1$, three of which were associated with the same (complex) variable. The 5 factor solution for females produced 3 residual correlations $> .1$. Examination of the 5 factor solutions suggested that the 5th factor was uninterpretable for males and weakly defined for females. Therefore, despite the magnitude of some residual correlations, extracting more factors seemed inappropriate.

Although male and female factor solutions suggested that core items for the first four factors were similar, the pattern of some other variables varied across the two groups. Items exhibiting similar and stable patterns of relationship for males and females were retained for Stage 2 of the analysis⁵. Those variables not included in Stage 2 are listed in Appendix B-5.

While pattern loading for the items used to represent the four factors will be introduced in the next section, a detailed presentation of each factor will follow presentation of the results for the Replication Sample.

Stage Two. Final factor analyses for males and females were conducted on 19 remaining variables. Four factors, with oblique rotation

to a solution, were requested. Again, the number of iterations necessary for the solutions were 7 for males and 4 for females. Communalities for male and female final solutions are presented in Appendix B-6.

Inspection of the residual matrices indicated 0 values greater than .1 for males and only 1 residual values greater than .1 (.102) for females.

Pattern matrices for female and male solutions are presented in Table 4a and 4b, respectively. Pattern loadings less than .25 have been set to zero. Structure matrices associated with the solutions may be found in Appendix B-7. As one can see, similar variables loaded together for males and females, although the order of rotated factors varied across the groups. The variables proposed as representative of the factors, along with their interpretive labels, are listed in Table 5. The range of correlations among the four factors was from .34 to .56 for males and from .41 to .51 for females. As one can see, all factors apparently shared some variance. A complete listing of Factor correlations for both males and females may be found in Appendix B-8.

Replication Sample (Preliminary Considerations)

All subjects included in the Replication Sample had complete data⁶.

Table 4a. Criterion Females : Four Factor Solution Pattern Matrix, Final
19 Selected Absorption Items.

Variables	I	II	III	IV
Introspective Absorption				
A19		.649		
A20		.697		
A22		.430	.253	
A32		.609		
Reality Absorption				
A2	.456			
A6	.719			
A15	.369			
A23	.633			
A34	.590			
Synesthesia				
A10			.522	
A17			.416	
A26			.395	
A27			.500	
A33			.756	
Mysticism				
A5				.360
A8				.453
A9				.717
A11				.588
A31		.417		.358

Pattern loadings less than .25 have been omitted.

Table 4b. Criterion Males: Four Factor Solution Pattern Matrix, Final 19 Selected Absorption Items.

Variables	I	II	III	IV
Introspective Absorption				
A19	.254			
A20				.398
A22				.605
A32				.718
Reality Absorption				
A2			.287	
A6			.388	
A15	.250		.410	
A23			.268	.529
A34			1.066	
Synesthesia				
A10	.564			
A17	.639			
A26	.552			
A27	.516			
A33	.726			
Mysticism				
A5		.534		
A8		.662		
A9		.711		
A11	.357	.526		
A31		.485		

Pattern loadings less than .25 have been omitted.

Table 5. Items and Interpretive Labels, Four Factor Solution, for Final 19 Selected Absorption Items.

Introspective Absorption

- A19 I can sometimes recollect certain past experiences in my life with such clarity and vividness that it is like living them again or almost so.
- A20 Things that might seem meaningless to others often make sense to me.
- A22 My thoughts often don't occur as words but as visual images.
- A32 Sometimes thoughts and images come to me without the slightest effort on my part.

Reality Absorption Items

- A6 I like to watch cloud shapes change in the sky.
- A15 The crackly and flames of a wood fire stimulate my imagination.
- A23 I often take delight in small things (like the five-pointed star shape that appears when you cut an apple across the core or the colours in soap bubbles).
- A34 I can be deeply moved by a sunset.
- A2 I can be greatly moved by eloquent or poetic language.

Synergic Items

- A10 Textures-such as wool, sand, wood- sometimes remind me of colours or music.
- A17 Different colours have distinctive and special meanings for me.
- A26 Some of my most vivid memories are called up by scents and smells.
- A27 Certain pieces of music remind me of pictures or moving patterns of colour.
- A33 I find that different odors have different colours.

Mysticism

- A5 Sometimes I feel as if my mind could envelop the whole world.
- A8 I think I really know what some people mean when they talk about mystical experiences.
- A9 I sometimes "step outside" my usual self and experience an entirely different state of being.
- A11 Sometimes I experience things as if they were doubly real.
- A31 At times I somehow feel the presence of someone who is not physically there.

Unlike the Criterion Sample, sample sizes for the Replication Sample (N=144 females; N=82 males) were not really satisfactory for factor analyses. To minimize problems associated with small subject to variable ratios, the Replication Sample was used primarily to investigate the four factor model presented above. This reduced the number of variables from 34 to 19.

To identify case outliers, the procedure used for the Criterion samples was applied to the Replication sample. Initial Principal Components analyses for males and females, involving all 34 variables, were used to identify case outliers. Four females were identified as outliers and were dropped from subsequent factor analyses. None of the males were identified as outliers.

Factor Analyses: Replication Sample

Squared multiple correlations for the final 19 items for the Replication sample are presented in Appendix B-10. Means, standard deviations and coefficients of skewness for the 19 selected Absorption item may be found in Appendix B-9.

The 19 variables comprising the proposed subfactors from the

Criterion Sample were factor analysed separately for Replication males and females. For males, 9 iterations to a solution were necessary; 5 iterations to a solution were necessary for females. Four factors were requested and then obliquely rotated. Communalities for these solutions are presented in Appendix B-10. Males and females in the Replication sample exhibited, for the most part, the same factor structure generated by males and females in the Criterion sample. There were, however, some inconsistencies across samples (to be considered in the next section- Absorption Subfactors). Pattern and Structure matrices for Replication males and females are presented in Appendices B-11 and B-12 respectively. Intercorrelations among factors, for Replication females and males are presented in Appendix B-13.

Residual correlation matrices for both males and females revealed a number of residual values $> .10$ (6 in female sample; 11 in male sample). The dangerously small N s involved in these analyses may have contributed to the degraded reproduced correlations matrices. It should also be noted, that higher residual values tended to involve variables exhibiting low initial squared multiple correlations.

High residuals, however, may also signal the need to extract more

factors than originally requested. The solution for females produced only 4 unrotated factors with eigenvalues greater than 1. The solution for males, however, produced 5 unrotated factors with eigenvalues greater than 1. A 5 factor solution for males produced the same 4 factors as their original solution and a weakly defined and uninterpretable 5th factor. The 5 factor solution for males also did not appreciably reduce the number of high residual correlations, 7 residual correlations $> .1$ still remained. When males and females were combined to increase the sample size, the same four structure emerged (also 4 unrotated factors with eigenvalues > 1), with the solution resulting in 4 residual correlations $> .1$. While the number of residual values was still unsatisfactory, results indicated that, for both males and females, 4 was the appropriate number of factors present for this set of variables.

Absorption Subfactors

Table 6 lists, for females and males in the Criterion and Replication samples, means and standard deviations for the four primary factors to be discussed in this section. Since the number of items comprising primary factors were unequal, mean values were averaged, with possible

Table 6. For Females and Males in Criterion and Replication Samples: Means and Standard Deviations for Primary Factors.

Sample	Introspective Absorption		Reality Absorption		Synesthesia		Mysticism	
	M	SD	M	SD	M	SD	M	SD
<u>Criterion Sample</u>								
Females	2.80	.692	2.81	.707	2.23	.686	2.01	.659
Males	2.86	.694	2.51	.745	2.19	.719	1.96	.698
<u>Replication Sample</u>								
Females	2.94	.577	2.91	.655	2.33	.672	2.06	.604
Males	2.97	.559	2.70	.719	2.18	.692	1.97	.578

values ranging from 1 to 4. The mean values associated with the first two factors in Table 6 are clearly higher than the means associated with the second two factors listed. This pattern is the same across all four groups. As will be shown, the differential prevalence rate of the experiences associated with primary factors may prove important to

understanding the interrelationship among primary factors.

Introspective Absorption. Table 7 lists, for females and males of both samples, Pattern and Structure loadings for Introspective Absorption Items. This table also contains Cronbach alpha reliability coefficients for the 4 items comprising this factor. The mean values for individual Introspective Absorption items, compared to most other primary factor items, were uniformly high (see Appendices B-1 and B-10). From Table 6, one can see that the Introspective Absorption factor also represents one of the "easier" primary factor generated. Pattern and Structure loadings reported in Table 7, however, suggested that this factor showed some instability from Criterion to Replication sample. In addition, reliability coefficients were substantially lower from Criterion to Replication sample. It was also found that this factor was difficult to interpret precisely.

Several constructs come to mind when one considers Introspective Absorption items. For example, the factor may be tapping the ease with which subjects engage in vivid visual imagery. One item (A22) explicitly concerns itself with visual images and the centrality of visual imagery

Table 7. Introspective Absorption: Alpha Reliabilities, Pattern and Structure Loadings for All Four Samples.

Introspective Absorption

Variables	Criterion Sample			
	Females		Males	
	Pattern II	Structure	Pattern IV	Structure
A19	.649	.645	.250	.507
A20	.697	.774	.398	.578
A22	.430	.594	.605	.606
A32	.609	.697	.718	.772
Alpha=	.76		.71	

Variables	Replication Sample			
	Females		Males	
	Pattern I	Structure	Pattern IV	Structure
A19	.629	.636	.400	.395
A20	.505	.603	.881	.927
A22	.463	.524		.300
A32	.262	.398		.277
Alpha=	.67		.61	

Loadings below .25 have been omitted.

is at least implied by two of the remaining three items. The persistently high loadings for item A20 (see Table 7), however, suggested that an alternative (and hopefully more unifying) interpretation was necessary. A "tendency to make sense of what others appear to consider meaningless" suggests the process of introspective thought. A general notion of introspective absorbed attention seems consistent with all 4 items. It should be kept in mind, however, that possible alternative interpretations of this subfactor underscore its complexity. Lowered reliability coefficient (see Table 7) may indicate that differing interpretations were adopted by subjects as well.

Reality Absorption. Table 8 lists, for all four groups, reliability coefficients, Pattern and Structure loadings of Reality Absorption items.

Most items for this factor appeared stable. As one can see from Table 8, reliability coefficients appeared stable and of acceptable magnitudes from Criterion to Replication sample. The mean values for individual Reality Absorption items showed somewhat more variability than Introspective Absorption items, particularly for males. The overall mean value for Reality Absorption, however, suggested that this factor also

Table 8. Reality Absorption: Alpha Reliabilities, Pattern and Structure Loadings for All Four Samples.

Reality Absorption

Variables	Criterion Sample			
	Females		Males	
	Pattern I	Structure	Pattern III	Structure
A2*	.456	.485	.287	.459
A6	.719	.708	.388	.483
A15	.369	.541	.410	.547
A23	.633	.704	.268	.510
A34	.590	.650	1.066	.990
Alpha=	.74		.74	

Variables	Replication Sample			
	Females		Males	
	Pattern II	Structure	Pattern II	Structure
A2*	.409	.476		.390
A6	.610	.634	.459	.507
A15	.523	.644	.678	.710
A23		.418	.416	.614
A34	.856	.835	.846	.817
Alpha=	.72		.75	

*Item later dropped and factor reinterpreted as Reality (Nature) Absorption.
Loadings below .25 have been omitted.

represented more common ("easier") absorption experiences than Synesthesia or Mysticism subfactors (see Table 6).

The Reality Absorption subfactor contains several of the items that have traditionally been used to describe the Absorption scale as a whole (e.g., Tellegen, 1976). In addition, the factor label itself, was adopted from Tellegen & Atkinson's original interpretation of one of their Absorption subfactors. The type of experiences that reliably loaded together in this study, however, was much more restrictive than those Tellegen and Atkinson suggested for their category Reality Absorption. These authors described Reality Absorption as, "a tendency to become immersed in movies, acting, nature, voices, past events, etc... (p. 270)." The 34 item Absorption scale contains at least 1 (but sometimes several) descriptive items in each of these categories. Initial analyses for the Criterion samples suggested that Absorption items from these different categories failed to form a reliable factor. Rather, predominately experiences involving nature (or alternatively, experiences nonsocial in content) exhibited consistently high factor loadings on a common factor. Only item A2 (see Table 8) describing involvement in poetry failed to fit this description.

With respect to item A2, its pattern of loadings in Table 8 could be used to challenge its inclusion, particularly for males. The pattern and structure loadings for the Poetry item are the lowest for both samples of males. More consistent, though lower loadings for this item were also observed for females. Item A2 also failed to load above .40 during Stage 1 analyses of Criterion males and females. The decision to retain this item for Stage 2 analyses was due primarily to its consistency across male and female samples. Given these results, however, item A2 was dropped and the subfactor relabelled Reality (Nature) Absorption.

The results from Stage 1 suggested that "involvement in nature" items formed their own subfactor, which diverged from other involvement contexts (e.g., involvement in movies, plays, etc.). In fact, if one considers the results from Stage 1, other involvement contexts exhibited low loadings on the Introspective Absorption factor for males, rather than Reality Absorption. For females, these other involvement context items failed to load on any factors. In their original article, Tellegen and Atkinson did make reference to special circumstances when an attentional object is someone else. Involvement in the activities of another individual, such as characters in plays and movies,

or involvement in poetry, may have differing components of influence than those associated with nature involvements. It should be noted, however, that there were comparatively more nature involvement items within the Absorption scale and often only one item representing involvement in other contexts. Nature involvement items, however, do cut across different types of involvements in nature.

Synesthesia. Table 9 lists, for all four groups, reliability coefficients, Pattern and Structure loadings for Synesthesia items. Pattern and structure loadings suggest a high degree of stability for this subfactor across three of the four groups. Only females in the Replication sample showed deviations. Reliability coefficients, however, were comparatively high across all four samples.

Synesthesia refers to the involvement of sensory modalities, other than the one being stimulated, during a particular experience. For example, synesthesia would be used to describe the experience of color when the mode of stimulation was, in fact, sound. Four out of the five Synesthesia items fit this description precisely. Only one item (A17) does not expressly describe crossing sensory modalities. Colors having "special meanings" does, however, suggest the potential for a

Table 9. Synesthesia Factor : Alpha Reliabilities, Pattern and Structure Loadings for All Four Samples.

Synesthesia

Variables	Criterion Sample			
	Females		Males	
	Pattern	Structure	Pattern	Structure
	III		I	
A10	.522	.658	.564	.668
A17	.416	.596	.639	.702
A26	.395	.515	.552	.574
A27	.500	.620	.516	.657
A33	.756	.722	.726	.706
Alpha=	.77		.78	

Variables	Replication Sample			
	Females		Males	
	Pattern	Structure	Pattern	Structure
	IV		I	
A10	.627	.676	.368	.500
A17		.377	.625	.622
A26		.374	.666	.663
A27	.593	.671	.655	.686
A33	.720	.776	.651	.654
Alpha=	.76		.77	

Loadings below .25 have been omitted.

synesthetic experience. It should also be noted that for Synesthesia items, the specific contexts where such experiences might take place is left unspecified.

Tellegen and Atkinson (1974) suggested that the trait Absorption, "...appears to include the ability to operate diverse representational modalities synergistically so that a full but unified experience is realized (p. 275)." None of the factors initially generated by these authors (see Table 2), however, appeared similar to the factor produced here.

Although the mean values associated with Synesthesia items showed some variability, these values tended to be lower than the mean values for subfactor items discussed previously (see Appendices B-1 and B-10). This suggested that the occurrence of Synesthesia experiences may be less frequent than the experiences comprising Reality (Nature) Absorption or Introspective Absorption.

Mysticism. Table 10 lists, for all four groups, reliability coefficients, Pattern and Structure loadings for Mysticism items. As one can see from Table 10, the pattern of loadings for this subfactor (particularly Structure loadings) were highly consistent across all four

Table 10. Mysticism : Alpha Reliabilities, Pattern and Structure Loadings for All Four Samples.

Mysticism

Variables	Criterion Sample			
	Females		Males	
	Pattern IV	Structure	Pattern II	Structure
A5	.360	.540	.534	.612
A8	.453	.656	.662	.710
A9	.717	.750	.711	.717
A11	.588	.676	.526	.684
A31	.358	.565	.485	.574
Alpha=	.78		.77	

Variables	Replication Sample			
	Females		Males	
	Pattern III	Structure	Pattern III	Structure
A5	.579	.633	.476	.558
A8	.539	.679	.559	.617
A9	.655	.680	.594	.703
A11	.568	.624		.395
A31	.318	.475	.412	.451
Alpha=	.75		.70	

Loadings below .25 have been omitted.

groups. All reliability coefficients were in the .70s, with some shrinkage observed from criterion to replication sample. The mean values of Mysticism items, in comparison to the means of other subfactor items, were lower in magnitude. In general, these results suggested that the occurrence rate of "mystical" experiences for subjects in these samples was lower than for other subfactors. This was particularly true when Mysticism items were compared to Introspective and Reality (Nature) Absorption items.

The label, Mysticism, for the items listed in Table 10 was carried over from Ronnestad Factor Analytic results. Marker items listed by Ronnestad suggested that a similar factor emerged in his study (though inclusion of items in the present study may be more restrictive). In addition, the types of experiences described in a number of these items are similar to experiences described on other Mysticism scales (see Hood, 1974). As, O'Hara and Mungar's (1962) original work with "experience" items (pre-dating Tellegen and Atkinson, 1974) also produced a factor with similar content (labelled tolerance for Unusual Experiences). Tellegen and Atkinson's original work, however, failed to produce a similar subfactor. Comparison of the original and 34 item

revised Absorption scale indicated that most of the Mysticism subfactor items were added later.

The tendency for researchers to label the types of experiences listed in Table 10 as "mystical" underscores assumptions that such experiences signal a departure from normal "reality". Yet, a departure from normal reality (or fading of GRO; imaginative involvement) has been assumed to underlie the other three factors generated as well. These items, however, suggest the the degree of reality suspension may be more extreme, something not dealt with by Tellegan and Atkinson. In addition, for Mysticism items (like synesthesia items), the mode of stimulation (whether it be a memory or external stimulus) is left unspecified. The wording of items asks subjects to consider whether any of their previous experiences may be described by Mysticism items (i.e., by metaphors that could be considered inconsistent with one's normal reality orientation).

Relationship Among Factors

Since oblique rotation revealed substantial correlations among all factors, some degree of generality across factors was expected. Higher

order factor analyses involving the 4 primary factors were conducted for all four groups. The results of these analyses are presented in Table 11. For all four groups, one higher order factor "unified" the four primary factors. As one can see from Table 11, all loadings for the primary factors were above .64.

These results, along with other previous indicators, suggested the presence of one unified higher order factor with respect to the Absorption scale⁷. The final test applied investigated whether the primary factors demonstrated unidimensional "scalability". Scalability analyses were introduced to help test the hypothesis that the degree of Absorption systematically varies across the experiences represented. Specifically, if this hypothesis is correct, one should be able to "order" subjects in terms of their responses on the primary factors, with subjects' positively responding to more difficult items (presumably reflecting higher levels of involvement) also responding positively to easier items (presumably reflecting less involvement).

Introduction to Guttman Scaling

Guttman scaling procedures (see Guttman, 1947; 1950), also known

Table 11. Higher Order Analysis of Primary Absorption Subfactors for All Four Samples.

Pattern Loadings for Primary Subfactors

Primary Factor	Criterion Females	Criterion Males	Replication Females	Replication Males
Introspective Absorption	.770	.786	.655	.641
Reality (Nature) Absorption	.669	.648	.727	.677
Synesthesia	.754	.768	.721	.719
Mysticism	.795	.726	.697	.685
Variance Explained	2.43	2.15	1.96	1.85
Proportion of Variance Explained	.56	.54	.49	.46

as scalogram analysis (Coombs, 1964) attempts to determine the degree to which responses to a set of variables may be unidimensionally scaled. As an example, a subject who has "passed" a difficult math problem might also be expected to pass easier math problem. Therefore, a set of math problems varying in difficulty could probably be scaled. For the present set of variables (i.e., primary factors), if the difficulty level suggested by mean values reflects increasing levels of reality suspension, then these variables should exhibit scalability.

Table 12 contains a representation of the perfect scale types associated with this problem. A code of 1 indicates that a subject positively responded or "passed" a particular primary factor, while a code of 0 indicates that the a subject "failed" a particular primary factor. As one can see from Table 12, if a subject successfully passes the most difficult primary factor, they are expected to pass all factors below. Furthermore, if a subject fails easier primary factors, they are not expected to successfully pass more difficult factors. Each perfect scale type in Table 14 is also associated with a score representing the number of levels passed. If all subjects were to exhibit perfect scale types, one would be able to use subjects' summed scores across primary

Table 12. Representation of Perfect Scale Types for Primary Absorption Subfactors.

Perfect Scale Types					
I	R	S	M	Score	
1	1	1	1	4	
1	1	1	0	3	
1	1	0	0	2	
1	0	0	0	1	
0	0	0	0	0	

I= Introspective Absorption
 R= Reality (Nature)Absorption
 S= Synesthesia
 M= Mysticism

factors to reproduce exactly their responses to primary factors (i.e., determine which primary factors were passed and which were failed).

As mentioned earlier, the order of means across groups was used to determine the order of scale components (see Table 6 for the order). It was recognized, however, that the difference between means for Introspective and Reality (Nature) Absorption was small and that these two primary factors probably reflected similar levels of involvement. Nevertheless, on a theoretical level, one could argue that more suspension of reality may be associated with involvement in nature, than introspective thought. The same type of reasoning was applied to the small mean difference between Synesthesia and Mysticism factors. What is interesting about Synesthesia is that it has been interpreted as a cognitive aptitude (Tellegen & Atkinson, 1974). Whether suspending reality leads to synesthesia experiences or the ability itself serves as a catalyst for imaginative involvement experiences is unclear.

Scalogram Analysis. In order to complete hand calculations, subjects responses on all four primary factors were dichotomized on a "pass"/"fail" basis. The range of possible scores for all primary factors was from 1 to 4. The pass/fail cut-off chosen was the same for all

factors. If a factor score was greater than or equal to 2.5, the subject was categorized as passing the factor. Scores less than 2.5 were categorized as failing the factor. It was recognized that dichotomizing factor scores reduced the sensitivity of subsequent analyses (see Coombs, 1964). It was hoped, however, that the precision used to develop the primary factors would lead to an ordering among factors that proved robust.

Males and females within Criterion and Replication samples were analysed separately. Only subjects with complete data for all primary factor items were included (i.e., no estimation of specific items were made). Those identified as outliers in previous factor analyses were also included in scalogram analyses, provided they also had responded to all items comprising primary factors⁸. Results, along with the number of subjects in each group, are presented in Table 13. This table also includes the formulas used to calculate the statistics listed (from Dunn-Rankin, 1983). Marginal proportions used to calculate Minimal Marginal Reproducibility are presented in Appendix B-15.

As indicated in Table 13, approximately 80% of the subjects in each group exhibited perfect scalability (i.e., produced one of the patterns

Table 13. Results of Guttman Scalogram Analysis for All Four Samples.

Group	% Perfect Scalability	Coefficient of Reproducibility (CR)	Minimal Marginal Reproducibility (MMR)	% Improve- ment (PI)	Coefficient of Scalability (CS)
Criterion Sample					
Females (n=258)	79%	.89	.719	.171	.608
Males (n=254)	82%	.91	.698	.212	.702
Replication Sample					
Females (n=144)	82%	.91	.764	.146	.619
Males (n=82)	80.5%	.91	.716	.194	.683

Formulas (From Dunn-Rankin, 1983):

$$1. CR = 1 - \frac{\sum e}{N K}$$

where, e = number of errors
 N = Number of subjects
 K = Number of variables

Note. Product of $N K$ equals the maximum number of possible errors.

$$2. MMR = \frac{\sum_{i=1}^K p_i \text{ or } q_i}{K}$$

where, p or q is maximum

$$3. PI = CR - MMR$$

$$4. CS = \frac{PI}{1 - MMR}$$

depicted in Table 12). Coefficients of Reproducibility, an indicator of the proposed scale's ability to reproduce subjects summed scores, were calculated for all four groups. Guttman (1950) has suggested that coefficients $> .90$ indicate an effective approximation to a perfect scale (see also Edwards, 1957). Only Criterion Females failed to generate a Coefficient of Reproducibility greater than .90.

Dunn-Rankin (1983) has also suggested, "...the effectiveness of a reproducibility coefficient must be made in light of the minimal reproducibility possible...(p. 106)." The formula for determining minimum reproducibility is given in Table 13. As one can see, minimal marginal reproducibility increased as the proportion of subjects passing or failing items became more extreme. The percentage of improvement (see Table 13) for a particular sample is the difference between Coefficient of Reproducibility and Minimum Marginal Reproducibility. Once these values have been determined, the Coefficient of Scalability may be calculated. According to Dunn-Rankin (1983), scalability coefficients $> .60$ may be considered meaningful. All samples, including Criterion Females, exceeded this critical value.

Discussion - Study 1

Absorption: Unidimensional vs. Multidimensional

The primary purpose of this study was to investigate whether the experiences described by items on the Absorption scale are best thought of as unidimensionally related or multidimensionally related. Arguments in the past have been made for both perspectives. To address this issue, this study considered whether the Absorption scale produced stable subfactors and then focused on the interrelationship among these subfactors.

The evidence generated by this study provided impressive support for interpreting at least a subset of Absorption items as unidimensionally related. Even during the initial stages of data cleaning, preliminary unrotated Principal Components Analyses for both males and females in the criterion and replication samples indicated that virtually all variables on the Absorption scale loaded above .45 on the first principal component. Only after rotation did distinct factors emerge.

A number of indicators associated with the final 4 factor solution also suggested the presence of one (unidimensional) higher order factor. First, structure loadings for the final factor solutions revealed that

many variables showed at least moderate structure loadings (greater than .40) on a number of other factors. This was particularly true for the Criterion samples. Further derived factor scores showed moderate to high correlations. These correlations among subfactors were even higher when subfactors scores were averaged across items. More importantly, however, for all four groups in this study, a higher order factor analysis involving the 4 subfactors produced one higher order factor that "unified" the subfactors. This finding was consistent with Tellegen and Atkinson's original finding that a higher order factor analysis unified a subset of their original subfactors. Despite a more restrictive interpretation of subfactors adopted here (which involved attempts to purify the subfactors in a way not adopted by Tellegen and Atkinson, 1974), results were consistent with those of Tellegen and Atkinson.

Finally, scalogram analyses, which test the degree to which variables may be unidimensionally scaled, were conducted on all four groups in Study 1. Results indicated that the responses of subjects in all four groups exhibited a high degree of scalability. Specifically, subjects that responded affirmatively to the "more difficult" subfactors (as indicated by mean values) also tended to respond affirmatively to

"easier" subfactors. Similarly, if subjects failed to respond affirmatively to "easier" subfactor items, they also failed to pass more difficult subfactor items. While the replication of these results across four different groups was impressive, results of a scalogram analysis involving only four variables should not be used to decide whether a scale is unidimensional. The results of this test in conjunction with the results of these factor analyses reported above, however, did provide impressive support that over half of the items on the Absorption scale appear to be unidimensionally related.

Absorption as Involving Levels of Reality Suspension

In their original article Tellegen and Atkinson (1974) argued that the Absorption scale should be considered unidimensional. The subset of items loading on one factor for their higher order analysis was used to operationally define Absorption. According to these authors, different subfactors on the Absorption scale were simply tapping different facets or components of Absorption. All items, however, were viewed as reflecting the primary characteristic of Absorption, that of "total" attention or a unified representation of an attentional object (see p.

274). From their discussion it is clear that the authors considered the degree of representational commitment associated with the experiences described as constant. In other words, Tellegen and Atkinson suggested that the degree of "total" attention underlying Introspective (or Reality) Absorption items should be considered the same as the degree of "total" attention underlying Mysticism (or Synesthesia) items.

As this study showed, however, Absorption subfactors demonstrated not only variability in mean values but also scalability. These findings suggested that Absorption items might be interpreted as demonstrating differing levels of "difficulty". One interpretation of apparent differences in difficulty is that the degree of involvement reflected in items, in fact, differs across Absorption items, with involvement increasing as subfactors become more difficult. This would suggest that the degree to which individuals are willing to suspend their "normal" reality orientation is not constant. Individuals should not be considered as either motivated or unmotivated to become totally absorbed in a particular experience, as implied by Tellegen and Atkinson. This alternative interpretation suggests that "willingness to suspend reality" should be considered a motivational continuum that helps to determine

involvement levels. As involvement levels increase, individuals by definition have suspended reality to a greater degree allowing for the more "intense" experiences implied by more difficult Absorption items (e.g., experiences that include a synesthesia component and/or experiences perceived as mystical). It is interesting to note that Tellegen and Atkinson considered Maslow's description of "peak" experiences as exemplifying absorbed experiences. Generally, Maslow and others have considered peak experiences to be an uncommon phenomenon (e.g., Maslow, 1970; Rogers, 1961). Since Tellegen and Atkinson's discussion did not consider absorbed experiences as uncommon phenomenon, there is room to suggest degrees of Absorption or involvement that are lower than that implied by peak experiences.

Absorption Items: Context Specific vs. Context Neutral

The types of contexts perceived as inspiring imaginatively involved experiences has played an important role in determining the content of involvement scales both within and outside the area of hypnosis. In other areas of research, those attempting to develop scales have also focused on identifying specific contexts that have traditionally been

defined as indicators of imaginative involvement. Within the area of hypnosis, all researchers that have attempted to develop scales have focused on identifying those types of experiences predictive of hypnosis. Even Tellegen (1976) described the Absorption scale in terms of specific contexts.

In conducting the exploratory factor analyses for this study, one of the striking characteristics of the subfactors generated was that only one of the four final subscales was dominated by context specific items. Only Reality (Nature) Absorption contained items that described specific events. If one reviews the items defining the other subfactors, particularly the Synesthesia and Mysticism subfactors, one can see that most of these items are context "neutral". No specific event/context is mentioned within the item. Moreover, if one reviews the content of those items not used in the final four subscales (see Appendix B-3), one will see that the vast majority of these items described a specific context.

The emphasis when developing the Absorption factors in this study was on identifying stable subfactors. While one should not lose sight of the fact that the behaviour of unrotated Absorption items suggested

unidimensionality among all items, the issue of context specific vs. context neutral does help to provide an explanation for why some items on the Absorption scale, nevertheless, defined subfactors. For most factor items, particularly those defining Synesthesia and Mysticism subfactors, the "type" of experience described by items defining a particular subfactor is similar. The content of the items, however, invites the subject to look across their experiences and determine whether there has been any context that has sparked the type of experience described. Consequently, context neutral items do not impose a context for the type of experience described, and appreciate that the experiences leading to, for example, a mystical experience, may be diverse. This may help to explain why three out of the four subfactors generated in this study were dominated by context neutral items. Individuals were not required to match both level or intensity of experience and context. The possible confound with difficulty, however, should not be overlooked. It is possible that "item difficulty" contributed to the stronger association of mysticism and synesthesia factor items. Further research, which attempts to develop context neutral items reflecting "easier" Absorption levels may help to clarify

this issue.

There was one subfactor, Reality (Nature) Absorption, that was dominated by context specific items. Interestingly, Reality (Nature) Absorption items are those most often used to describe the scale. There are several possible explanations for why these context dependent items formed a reliable factor. For example, one explanation may be that the level of Absorption in nature described by these items may be such a common occurrence that individuals are very familiar and, therefore, more consistent in their responses. Alternatively, however, one must also consider that the Absorption scale contains a number of nature items, while other contexts are represented by one or at the most a few items. It is possible that if the scale had contained more items describing a specific context (e.g., involvement in reading), more subfactors may have emerged. Moreover, Reality (Nature) Absorption items tended to suggest a similar (i.e., easier) level of involvement. Other clusters of context specific items that failed to reliably load, however, tended to cut across difficulty levels (see Variables Not Used, Appendix B-3).

The Future of the Absorption Scale

The previous discussion was not designed to downplay the importance of context to involved experiences. The commonality of the type of contexts traditionally defined as promoting imaginative involvement does suggest that our experiences are often similar within this area; that there are societal norms which dictate the types of experiences that signal imaginative involvement and the contexts that these experiences are associated with. We should not lose sight of the fact, however, that each individual's unique experience concerning imaginative involvement is also important. This would seem particularly true when one considers "higher" levels of involvement or Absorption.

One of the reasons the Absorption scale may have survived as a viable measurement tool of imaginative involvement is because it does incorporate a good proportion of items that are context neutral. These items allow individuals to express high levels of involvement without being constrained by a limited set of contexts. Another reason may be that the scale incorporates a number of items that describe more difficult levels of Absorption. As a result, the Absorption scale, in

comparison to other involvement scales, may not impose a ceiling on the degree of involvement measured. Finally, since the analyses pursued in Study 1 were exploratory, the Absorption scale used in the next two studies was defined by all 34 Absorption items. One of the purposes of Study 3, however, was to compare the predictive power of the Absorption scale and its more extended range with other fantasy involvement scales. Where appropriate, the predictive power of the subfactors generated in this study was also explored in Study 3.

Study 2-Introduction

Since its development, the Absorption scale has received extensive usage within the area of hypnosis. For the most part, Absorption and susceptibility scores have exhibited low to moderate correlations, as indicated in Table 14 (from de Groh, 1989; includes most studies prior to 1987). The pattern of these results also suggests that, generally, moderate correlation magnitudes have been achieved in studies employing comparatively small sample sizes. Some exceptions to this observation involve studies using more difficult susceptibility scales (e.g., CURSS; SHSS:C). If more difficult susceptibility scales produce comparatively stronger correlations with the Absorption scale, this would be consistent with Balthazard and Woody (1987) suggestion that the Absorption scale exhibits a stronger relationship with more difficult hypnotic suggestions.

Recently, Kihlstrom and his associates conducted a number of studies investigating the relationship between absorption and susceptibility using much larger sample sizes than most past research. Nadon, et al. (1991) reviewed the results for ten separate mixed gender samples which included from 166 to 1300 subjects (nine out of ten of

Table 14. Correlations for Absorption and Hypnotic Susceptibility (From de Groh, 1989).

<u>Susceptibility Scales</u>	<u>r values</u>	<u>Sample Size</u>
<u>Barber Suggestibility Scale (BSS)</u>		
Spanos, McPeake & Churchill (1976)	$r = -.13$, ns $r = .23$, ns	36(f) 55(m)
<u>Harvard Group Scale of Hypnotic Susceptibility (HGSHS:A)</u>		
Hilgard, et al. (1981)	$r = .13$ $r = .33$	237(c) 92(c)
Spanos, Stam, Rivers & Radtke (1980)	$r = .32$, ns	34(c)
Farthing, Venturino & Brown (1983)	$r = .35$	122(c)
Spanos & McPeake (1975a)	$r = .43$ $r = .37$	83(f) 100(m)
Spanos & McPeake (1975b)		
Hypnotic Context (favorable)	$r = .41$	44(c)
Hypnotic Context (unfavorable)	$r = .17$, ns	42(c)
Spanos, Pawlak, D'Eon, Mah & Ritchie (1980)	$r = .19$, ns	91(c)
Yanchar & Johnson (1981)	$r = .29$	99(c)
Tellegen & Atkinson (1973)	$r = .27$	142(f)
(GSHS, variation of HGSHS:A)	$r = .43$	171(f)
<u>Carleton University Responsiveness to Suggestion Scale (CURSS:O)</u>		
Spanos, Radtke, Hodgins, et al. (1983)		
Study 2	$r = .30$	102(c)
Spanos, Brett, Menary & Cross (1987)	$r = .41$ $r = .18$	250(f) 213(m)
<u>Stanford Hypnotic Susceptibility Scale (SHSS:C)</u>		
Spanos, Pawlak, et al. (1986)	$r = .28$	91(c)
Finke & MacDonald (1978)	$r = .39$ $r = .32$, ns	160(f) 28(m)
Crawford (1982)	$r = .57$	31(f)
Composite scores SHSS:A and SHSS:C	$r = .36$, ns	25(m)
Spanos, Radtke, Hodgins, et al. (1983; Study 2)	$r = .24$, ns	102(c)

Unless otherwise indicated, all r values statistically significant at $p < .05$, two-tailed.

these samples included more than 375 subjects). For these samples, correlations between susceptibility and absorption ranged from $r=.17$ to $r=.27$ (weighted average correlation across samples was approximately $r=.22$). All correlations reported by Nadon, et al. were statistically significant, which is not surprising, given the large sample sizes. These authors, however, interpreted the relationship between Absorption and susceptibility scores as consistent, reliable and meaningful. This interpretation underscores the approach of many researchers in this area who continue to use statistical significance as the sole indicator of whether the relationship between absorption and susceptibility is meaningful when large sample sizes are employed. A correlation of $r=.22$, however, would indicate that the variance absorption and susceptibility "share" is less than 5%, which seriously questions the meaningfulness of absorption as a predictor of susceptibility.

The tendency of hypnosis researchers to interpret low correlation magnitudes between the Absorption scale and susceptibility as meaningful is somewhat understandable. Much time and effort has been expended attempting to identify predictors of susceptibility. Absorption has proved the most promising. Some researchers, however, have also

acknowledged concerns about low correlation magnitudes and have investigated whether attenuating circumstances, such as the presence of moderating variables may be the reason. Both gender (e.g., Bowers, 1971; de Groh, 1989) and attitudes toward hypnosis (e.g., Spanos, Brett, et al., 1987) have been suggested as potential moderating variables.

Gender as a Moderating Variable

As one can see from Table 14, a number of studies have analysed the relationship between absorption and susceptibility separately for males and females. While comparison of correlation magnitudes for males and females across studies suggests that the relationship between absorption and susceptibility may be slightly stronger for females than males, only one study found this difference to be statistically significant (Spanos, Brett, et al., 1987). In Kihlstrom's most recent study, which employed much larger sample sizes than previous research (n=738, Study 1; n=550, Study 2), he and his associates also reported correlations for absorption and susceptibility separately for males and females (see Glisky, Tataryn, Tobias, Kihlstrom & Mc Conkey, 1991). The differences between correlations for males and females were not

statistically significant for any of his three separate samples.

Kihlstrom and his associates, however, also criticized previous researchers for analyzing males and females separately when, "...there does not appear to be any theoretical reason to expect such a gender difference to occur (p. 10)".

Testing for gender differences is consistent with Eichler's (1988) guidelines concerning the conduct of non-sexist research. Moreover, with respect to hypnosis research, some findings do suggest gender differences should be investigated before male and female subjects are combined into one analysis. In particular, as stated earlier there is a suggested trend across studies for absorption and susceptibility to correlate higher for females than for males. While correlation magnitudes differences rarely achieve statistical significance, the trend itself would seem to warrant investigation of gender differences. When considering these results one should also keep in mind that Tellegen and Atkinson's original scale construction involved all female samples⁹.

It would appear that one of Kihlstrom's primary concerns is the interpretation that researchers sometimes place on correlational results for females and males. Kihlstrom is correct in observing that

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PM-1 3½"x4" PHOTOGRAPHIC MICROCOPY TARGET
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researchers often emphasize differences in correlation magnitudes for males and females in the absence of statistically significant differences. This, however, is an issue concerning the interpretation of statistical results, not the analyses themselves, particularly in the presence of an a priori hypothesis. Combining males and females to increase statistical power also seems to be an inadequate excuse for failing to investigate possible gender difference, particularly since many current correlational studies in hypnosis now employ such large sample sizes that statistical significance should not be considered the only indicator of a variable's predictive power. Reporting results for females and males (as well as combined results, if appropriate) can only provide the reader with additional information, since the lack of differences between males and females may also be of interest. This issue, however, cannot be assessed if only the results for males and females combined are reported. This controversy with respect to the relationship of absorption and susceptibility, however, may be moot, given that when reliable sample sizes are employed, neither correlations for males, females, or both combined appear to produce meaningful correlation magnitudes.

Attitudes as a Moderating Variable

Low correlation magnitudes for absorption and susceptibility have also prompted some researchers to investigate whether attitudes toward hypnosis moderate the relationship between these two variables (e.g., Spanos, Brett. et al, 1987; see also Crawford, 1982). Spanos and his associates became particularly interested in this possibility when visual plots of the relationship between absorption and susceptibility appeared to be fan-shaped. Specifically, visual plots suggested that subjects scoring low on the Absorption scale, for the most part, also achieved low susceptibility scores. As Absorption scores increased into the upper range on the scale, however, susceptibility scores varied considerably. Shor, et al.'s (1966) discussion of their results for "experience" items (PEQ) and susceptibility scores also hinted at this relationship.

That the relationship between absorption and susceptibility may violate the assumption of homoscedasticity will be dealt with in more detail in the next section. With respect to attitudes toward hypnosis, the possible moderating (or "interactive) effects of this variable have been suggested as a partial explanation for the fan-shaped relationship

and correspondingly low correlation magnitudes for absorption and susceptibility. Specifically, some subjects high on the Absorption scale may fail to achieve high levels of susceptibility due to detrimental attitudes. Spanos, Brett, et al., found that when only subjects with positive attitudes toward hypnosis were considered (i.e., above the median), the magnitude of the correlation between Absorption and susceptibility scores increased. The increases in correlation magnitudes, however, were not particularly impressive. Categorizing continuous variables, however, greatly reduces the sensitivity of analyses (see Cohen, 1990; Cohen & Cohen, 1975; Pedhazur, 1975). Analyses which maintain the continuous nature of these variables, thus far, have not been conducted.

Shape of the Relationship between Absorption and Susceptibility

As mentioned previously Spanos and his associates have suggested that low correlation magnitudes between absorption and susceptibility may result because the relationship between these two variables is fan-shaped. Technically speaking such a fan-shaped relationship would suggest that the relationship of these two variables violates the

assumption of homoscedasticity. Until recently, no formal assessment for heteroscedasticity had been conducted. Kihlstrom and his associates, however, tested whether the relationship between absorption and susceptibility violated the assumption of homoscedasticity using Bartlett's test for homogeneity of variance. For two separate samples of subjects ($n > 500$ in both studies), Bartlett's test was nonsignificant (see Glisky, et al., 1991).

Kihlstrom and his associates also investigated whether the variability of absorption scores varied as a function of susceptibility (i.e., heteroscedasticity) by categorizing their two continuous variables (absorption and susceptibility) and then comparing the percentage of subjects falling into different cells of his contingency table. These researchers found for their first study: "Dividing both variables at their medians showed that 52.8% of low absorption subjects scored as highly hypnotizable, while only 34.8% of high absorption subjects scored as insusceptible. This pattern -- more low absorption subjects are hypnotizable than high absorption subjects are insusceptible -- is repeated regardless of where the cutpoints are established (p. 9)." The same pattern of results was also observed for their other study

investigating this relationship. Although Kihlstrom and his associates provided no statistical test, such as a X^2 analysis, he interpreted these results as meaningful. Furthermore, Kihlstrom interpreted this analysis as investigating whether the relationship between absorption and susceptibility departs from linearity. Their approach, however, is clearly a less sensitive assessment of the assumption of homoscedasticity, not linearity (Bartlett's test, provides a more sensitive assessment of the assumption of homoscedasticity). It is interesting, however, that the possible trend suggested by their data is a fan-shaped relationship different from the one predicted by Spanos and his associates. Specifically, their data suggested that low absorption subjects exhibited more variability in their susceptibility scores than high absorption subjects. Though Kihlstrom and his associates claimed that "high absorption subjects are infrequently insusceptible to hypnosis", the percentages reported (i.e., 34.8% of high absorption subjects were "insusceptible") underscores the lack of relationship between absorption and susceptibility.

It should be noted that Kihlstrom and his associates also applied appropriate tests for nonlinearity for the relationship of absorption and

susceptibility. Specifically, they also tested for a quadratic trend in the relationship of these two variables, after accounting for the variance associated with a linear trend. Results for their two studies were mixed. For Study 1, their test for nonlinearity was not statistically significant. For their other study, however, the test for a quadratic trend was statistically significant (see Glisky, et al., 1991). The reported R-value for absorption and susceptibility, however, increased from .17 to .20 ($R^2=.04$). Clearly, describing the relationship of absorption and susceptibility as quadratic still does not suggest a particularly meaningful relationship between these two variables.

Absorption and Susceptibility: A Context Dependent Relationship?

The studies reviewed thus far have all measured absorption within the hypnotic context (e.g., right before susceptibility testing). Council, Kirsch and Hafner (1986) have suggested that the relationship that has been observed in such studies is context dependent. Specifically, Council, Kirsch et al. (1986) suggested that statistically significant correlations between absorption and susceptibility are the consequence of administering the Absorption scale within the context of hypnotic

susceptibility testing. These authors noted that all items on the Absorption scale are positively keyed and face obvious (see Appendix A), allowing easy self-assessment by subjects. It is this self-assessment which is viewed by these authors as indirectly influencing subjects' subsequent hypnotic responsiveness. Since this influence can occur only if subjects perceive a connection between their responses on the Absorption scale and susceptibility testing, Council, et al. predicted no relationship between Absorption scores and susceptibility scores when the Absorption scale was administered to subjects outside of the hypnotic context.

To test this hypothesis, Council, et al. compared the correlation between Absorption and susceptibility scores for subjects who rated the Absorption scale outside of the hypnotic context ($n=64$) with the correlation between these two variables for subjects ($n=64$) who rated the Absorption scale just prior to being administered a hypnotic induction. When absorption was measured within the hypnotic context, a subjective measure of subjects' responsiveness significantly correlated with Absorption scores ($r=.31$), while objective susceptibility scores failed to significantly correlate ($r=.22$, ns). When absorption was

measured outside of the hypnotic context, Absorption scores failed to correlate with either subjective ($r = -.14$, ns) or objective ($r = -.03$, ns) susceptibility scores. Furthermore, for subjective susceptibility scores, the joint relationship (i.e., interaction) between Absorption scores and context when subjective susceptibility scores were the criterion was found to be statistically significant. That is, the correlation between absorption and subjective susceptibility scores was significantly higher when absorption was assessed within context than when absorption was measured outside the hypnotic context. This finding provided support for the context dependency hypothesis. Context effects, however, did not emerge for the more traditional measure of susceptibility (i.e., objective susceptibility scores).

Recently, a number of studies have tested the context dependency hypothesis using a variety of different designs. For example, de Groot, Gwynn and Spanos (1988) adopted a between groups design like Council, et al. (1986). In de Groot's study, however, all subjects completed the Absorption scale in a session separate from hypnotic susceptibility testing. During this separate session, however, some subjects were informed of subsequent susceptibility testing (half were told of

subsequent susceptibility testing just prior to completing the Absorption and half were told of subsequent susceptibility testing after they had completed the Absorption scale). A third group completed the Absorption scales, but were not informed of subsequent susceptibility testing. This group was then contacted at a later date for the hypnosis experiment (no mention of the previous session was made). This approach is quite different to that of Council, Kirsch, et al., who measured absorption within context just prior to susceptibility testing.

Drake, Nash and Cawood (1991) tested for context effects with a between group design which included groups similar to both de Groot, et al. and Council, et al. For one group (n=48), the Absorption scale was administered just prior to susceptibility testing, which is the traditional within-context approach in hypnosis research. A second group of subjects (n=43) was recruited for a hypnosis experiment, but were administered the Absorption scale 24-36 hours prior to susceptibility testing. Finally, their third group (n=43) tested subjects on the Absorption scale prior to hypnosis, but in a context presumably unrelated to susceptibility testing. Twenty-four to forty eight hours later, these subjects were independently contacted to participate in an

hypnosis experiment. In another study, Balthazard and Woody (1987) claimed to assess the context dependency hypothesis by measuring absorption in a separate (presumably unrelated) session after hypnotic susceptibility had been assessed. This is also quite different from the studies reviewed above which measured absorption in a separate context prior to susceptibility testing.

Nadon, et al. (1991; Experiment 1) selected a within-groups design, whereby the same subjects received the Absorption in both a nonhypnotic context and later within a hypnotic context. In their second experiment, these authors employed a between groups design, though their methodology was dissimilar to Council, Kirsch, et al.¹⁰ Finally, Perlini, Lee and Spanos (1991) used what they termed a mixed design with some of their subjects completing the Absorption scale twice (both within and outside the hypnotic context) and other subjects completing the Absorption scale only once (some of these subjects completed the Absorption scale prior to susceptibility testing, while others completed the Absorption scale outside the hypnotic context).

These studies have produced produced mixed results with respect to the context dependency hypothesis. For example, Balthazard and Woody

(1987), who measured absorption in a separate context, but after susceptibility testing, reported an impressive correlation between Absorption scores and susceptibility scores ($r=.50$, $n=120$ males and females). This finding is not indicative of previous within context correlations magnitudes and their approach does not reflect a rigorous test of the context dependency hypothesis.

de Groot, et al. (1988) chose, a priori, to analyse males and females separately (approximately 50 female and 50 male subjects were included in each of their experimental conditions). For males, Absorption scores failed to significantly correlate with susceptibility, regardless of the context. For female subjects, however, Absorption scores significantly correlated with CURSS:0 scores when hypnosis was mentioned before ($r=.27$) and after ($r=.32$) the questionnaires were filled out. When no connection between Absorption responses and susceptibility testing was maintained, these two variables failed to correlate significantly ($r=-.16$, ns), with this nonsignificant correlation differing statistically from the other two groups. While the results for males and females did not differ significantly for this study, the results, nonetheless, provided partial support for the context dependency hypothesis. As one can see, however,

female "within context" correlations for Absorption and susceptibility were marginal. Drake, Nash, et al. (1991) have argued that their results also provided support for the context dependency hypothesis. In this study, when the Absorption scale was administered just prior to hypnosis, scores produced a statistically significant correlation with susceptibility ($r=.32$; $n=48$ females and males). When the Absorption scale was linked with hypnosis, but measured days before susceptibility testing, the correlation between these two variables was only $r=.14$ and not statistically significant ($n=42$ females and males). Finally, when Absorption testing and susceptibility testing were kept as independent experiments, these two variables again failed to correlate ($r=.02$; $n=43$ females and males). Drake, et al. argued that Absorption correlated with susceptibility only when measured within context and just prior to hypnosis, since this group was the only one which produced a statistically significant correlation. Differences among the correlations for the three groups, however, were not statistically significant, suggesting that chance fluctuation cannot be rejected as the reason for the differences between critical correlations.

Perlini, et al. (1991) conducted a between groups analysis similar to

Council, et al. (1986), but results failed to support the context dependency hypothesis. This was not surprising, given that correlations between Absorption and susceptibility were extremely low regardless of the context (Hypnotic context, $r=.15$, $n=180$; Nonhypnotic context, $r=.21$, $n=128$). Perlini, et al., however, also reported results for their within group methodology. For subjects in this analysis, Absorption was measured twice, first within a non-hypnotic context and then within the hypnotic context (i.e., just prior to susceptibility testing). Perlini, et al. conducted a regressed-change analysis (reported by Nadon, et al., 1991 see below) to test the context dependency hypothesis. The regressed change procedure resembles an analysis of covariance, whereby the relationship between hypnotizability and within context Absorption scores are assessed after the shared variability of Absorption scores produced outside the hypnotic context have been partialled out of within context Absorption scores. Specifically, for this analysis, within context Absorption scores are defined as the criterion variable. Absorption scores generated outside the hypnotic context are then entered first into the regression equation. This effectively partials out the variance shared by subjects Absorption scores across contexts.

Evidence for a context effect would be suggested if susceptibility measures predicted additional variance in the residualized hypnotic context Absorption scores. Perlini, et al. found that objective susceptibility scores did account for a statistically significant proportion of unique variance in within-context Absorption scores. Though his results were statistically significant, Perlini, et al. pointed out that the effect was small. In this study, objective susceptibility scores accounted for an additional 2.6% of the total variance of within context Absorption scores, which represented 7.3% of the variance in regressed change (i.e., residual variance; "true" variance of difference scores). Cohen and Cohen (1975) suggested that it is the variance in regressed change that should be interpreted. These results, however, should be interpreted in light of overall correlation magnitudes. Once again, objective susceptibility scores produced very low correlations with Absorption scores, regardless of the context (Hypnotic context, $r=.16$; Nonhypnotic context, $r=.01$; $n=90$).

Nadon, et al. (1991) conducted a within groups design similar to Perlini, et al. (1990). Subjects first completed the Absorption scale outside the hypnotic context and then again just prior to susceptibility

testing. Nadon, et al. reported results for a regressed change analysis and found that both objective and subjective susceptibility scores accounted for a statistically significant portion of unique variance in within context Absorption scores once out of context Absorption scores were controlled (1.12% and 1.62%, respectively). Nadon, et al. claimed that this context effect was weak, accounting for only a small portion of unique variance. While this statement may have some validity, Nadon, et al. did not report the proportion of variance accounted for in regressed change. Based on the numbers provided, objective and subjective susceptibility scores accounted for 3.6% and 5.2%, respectively, of the variance in regressed change (i.e., remaining variance, after controlling for out of context Absorption scores). Furthermore, Nadon, et al. failed to interpret his results within the context of overall correlation magnitudes. For this study, objective susceptibility scores correlated $r=.17$ with within context Absorption scores and $r=.14$ with out-of-context Absorption scores. Nadon, et al. interpreted both of these correlations as meaningful because both achieved statistical significance (sample size associated with these correlations, $n=475$).

Finally, for their second experiment, Nadon, et al. claimed that their

results contradicted the context dependency hypothesis. In this experiment 434 subjects received the Absorption scale in a survey context unrelated to hypnosis. Two weeks later, a subset of these subjects ($n=209$) completed the Absorption scale prior to susceptibility testing. The remaining subjects did not. This design allowed both between and within group analyses to be conducted. Results for the within group analysis (i.e., regressed-change analysis) failed to support a context dependency hypothesis. Results for their between group analysis (i.e., test of the incremental effect of a Context X Absorption interaction - see Council, et al, 1986) also failed to support a context dependency hypothesis. As in their first experiment, Nadon, et al. argued that their statistically significant correlations for objective susceptibility scores and within context Absorption scores ($r=.24$, $n=209$) and their statistically significant correlation for objective susceptibility scores and out of context Absorption scores ($r=.25$, $n=209$) reflected a meaningful relationship between these two variables.

As one can see, these results provide mixed support for the context dependency hypothesis. More importantly, however, results across these studies, for the most part, also seriously question the meaningfulness of

the relationship between susceptibility and Absorption, regardless of the context. Obviously, a meaningful within context relationship between these two variables is necessary before context dependency even becomes an issue. How can a context dependent relationship for Absorption scores and susceptibility be assessed in the absence of a meaningful relationship between these two variables to begin with? This issue has been recognized by some researchers (e.g., Perlini, et al., 1991), but ignored by others (e.g., Nadon, et al. 1991). That context effects have been produced at all is surprising and it is to Council, et al.'s credit that they recognized this potential effect. Study 2 was designed to take yet another look at the relationship of Absorption scores and susceptibility, in general, and the context dependency hypothesis, in particular.

Study 2

Study 2 represents an experimental test of whether the relationship between absorption and susceptibility is context dependent. All subjects in this study responded to the Absorption scale during the mass testing session (i.e., out of context). Subjects were then contacted and randomly

assigned to one of two conditions ($n=100$ for each condition; 50 males and 50 females). For the Prior to Hypnosis condition, subjects responded to the Absorption scale for the second time just prior to susceptibility testing (i.e., the traditional within context assessment of Absorption). For the After Hypnosis condition, subjects were not exposed to the Absorption scale prior to susceptibility testing. Rather, these subjects responded to the Absorption scale for the second time after their susceptibility level had already been tested.

For the Prior to Hypnosis Condition, the critical correlation was between subjects' Absorption responses just prior to susceptibility testing and subsequent susceptibility levels. For the After Hypnosis Condition, the critical correlation was between Absorption scores generated during the mass testing session (i.e., out-of-context) and susceptibility levels. If the relationship between the Absorption scale and susceptibility is context dependent or context effects are present, then the correlation between these two variables across Condition should differ significantly. The design of this study also allowed regressed change analyses to be conducted for two differing conditions. Subjects in both of the conditions in this study responded to the

Absorption scale twice, once during mass testing and once within the hypnotic context. Subjects in the two conditions, however, differed on when they were exposed to the Absorption scale. As previously stated, half of the subjects completed the Absorption scale Prior to Hypnosis testing and half completed the Absorption scale After Hypnosis testing had been completed. Difference across these two conditions, in terms of the magnitude of regressed change, may have important implications for the way context effects are interpreted.

Method-Study 2

Subjects

The only prerequisite for participation in Study 2 was the successful completion of the Absorption scale during the Mass Testing session at Carleton University, 1987-88 academic school year.

Volunteers for Study 2 were contacted by telephone and asked to participate in a Hypnosis Testing session lasting one hour. No mention of the mass testing session was made to subjects. One hundred male and 100 female Introductory Psychology students were tested, receiving either course credit or \$5 for their participation.

Materials

All subjects in Study 2 responded to the following questionnaires during the hypnosis session in the order listed: 1) A modified version of the Absorption scale (see Materials-Study 1); 2) The Bett's Vividness of Mental Imagery Questionnaire (VMI; Shor, et al., 1966), a 15-item scale assessing subjects' imagery vividness across several sensory modalities; 3) The Carleton University Attitude scale (Spanos, Brett, Menary & Cross, 1987), a 15-item scale assessing subjects' attitudes toward hypnosis and being hypnotized (the scale contains items assessing subjects' positive attitudes toward hypnosis, fearfulness of being hypnotized, and perceptions regarding the mental stability of successful hypnotic subjects); and 4) A one-item Expectancy measure asking subjects to estimate their expected level of responsiveness during the hypnotic procedure (this scale ranges from 0 - Not at all to 6 - A great deal). Copies of all measures used in this Study 2, except for the Absorption scale, may be found in Appendix C. Although all subjects in this study responded to all questionnaires, *the time during the hypnosis session when questionnaires were administered depended on the*

experimental condition in which subjects were randomly assigned (see Procedure-Study 2).

All subjects in Study 2 were administered the Carleton University Responsiveness to Suggestion Scale (CURSS; Spanos, Radtke, Hodgins, Stam, & Bertrand, 1983). The CURSS is comprised of 7 hypnotic suggestions varying in difficulty. A list of CURSS test suggestions may be found in Appendix D.

The CURSS yields three different types of susceptibility scores for each subject. On a pass/fail basis subjects are asked (after the hypnotic procedure has been terminated) to indicate whether they made overt responses to the suggestions they received. Positive responses are summed to generate CURSS:O scores. Traditionally, hypnosis researchers have operationally defined susceptibility levels in terms of overt (i.e., observable) responding. For each suggestion on the CURSS subjects were also asked to: 1) Indicate the degree to which they subjectively experienced suggested effects, and 2) Indicate, for suggestions "passed", the degree to which their overt responding was experienced as involuntary. Both of these experiences were rated by subjects on a 4 point scale ranging from "Not at all" (0) to "To a great degree" (3).

Summed responses for the degree to which subjects' subjectively experienced suggested effects defined CURSS:S scores. Scores on this scale, therefore, may range from 0 to 21. Overt-Involuntariness scores (CURSS:IO) were calculated by summing the suggestions "passed" and rated as occurring at least moderately involuntarily. Like CURSS:O scores, CURSS:IO scores may range from 0 to 7.

Procedure

Subjects were randomly assigned to one of two treatment conditions, with the restriction that 50 males and 50 females be included in each condition. Hypnosis sessions were conducted in groups of no more than six subjects. Individual hypnosis sessions were made available for those subjects unable to attend group sessions.

Procedure for Prior to Hypnosis Condition. Subjects in the Prior to Hypnosis Condition completed the set of questionnaires just prior to being administered the hypnotic induction associated with the CURSS. As stated previously, the order in which questionnaires were administered to subjects was: 1) The Absorption Scale; 2) Bett's VMI scale; 3) Carleton University Attitude Scale, and 4) One item Expectancy

measure. Subjects were also asked to sign a standard consent form. It should be emphasized that for subjects in the Prior to Hypnosis Condition, the Absorption scale was completed before completing the other questionnaires and before susceptibility testing commenced.

After the questionnaires were completed, subjects were administered a tape recorded standard 5 minute hypnotic induction procedure followed by the seven test suggestions associated with the CURSS. The voice on the tape was female. After completion of test suggestions, subjects received a standard hypnotic wake-up procedure. Subjects then completed the post-test CURSS booklet assessing their objective and subjective responses during the session. After the session was completed, subjects were debriefed and thanked for their participation.

Procedure for After Hypnosis Condition. The procedure outlined above was identical for the After Hypnosis Condition except that the Absorption scale, Bett's VMI and the Carleton Attitude scale were administered (in the order listed) to subjects after the post-test CURSS booklets had been completed. Therefore, unlike the Prior to Hypnosis Condition, subjects in the After Hypnosis condition were not

exposed to the Absorption scale until after their hypnotic susceptibility has been assessed. It should be noted that the one-item expectancy measure was administered to the After Hypnosis Condition just prior to undergoing the hypnosis procedure. Given that the Expectancy measure assesses expected responsiveness during the subsequent hypnotic session, it did not seem reasonable to administer this questionnaire post-experimentally.

Study 2- Results

Preliminary Considerations: Primary Variables

Missing Values. There were no missing values for CURSS:O, CURSS:S and CURSS:OI measures. Administration of the Absorption scales during the Mass Testing and Hypnosis Sessions resulted in only a small number of missing or out-of-range values¹¹. Out-of-range values were recoded in the manner adopted in Study 1. Due to procedural errors, however, a Mass Testing Absorption score was unavailable for 1 female in the Prior to Hypnosis Condition and a Hypnosis Session Absorption score was unavailable for 1 female in the After Hypnosis Condition. These subjects were deleted from further analyses on a casewise

basis¹².

Distribution of Primary Variables. The distributions of scores for the three CURSS measures, as well as Mass Testing and Hypnosis Session Absorption scores, were examined for skewness. Appendix E-1 contains the coefficients of skewness for these variables, broken down by Condition (i.e., Prior to Hypnosis and After Hypnosis Conditions) and Gender. Neither Absorption scores generated during the Mass Testing or Hypnosis Session were significantly skewed for any of the groups. Coefficients of skewness also failed to reach statistical significance (at $p < .01$) for CURSS:O scores.

For CURSS:S scores, only the distribution for males in the Prior to Hypnosis condition was significantly skewed. Examination of CURSS:S scores for males in this condition revealed one extreme outlier. This male evidenced a maximum score on CURSS:S (i.e., 21), the most extreme value for males in either experimental condition of this study. In order to temper the influence of this one score, with respect to other males in the Prior to Hypnosis Condition, this extreme outlier's score was recoded to a value one unit higher than the next highest CURSS:S score for males in the Prior to Hypnosis Condition (i.e., 17). Once recoded, CURSS:S

scores for males in the Prior to Hypnosis Condition, although still moderately skewed, were no longer severely skewed ($p > .01$).

As expected from previous research, CURSS:OI scores were severely skewed for males and females in both experimental conditions (see Appendix E-1). Since CURSS:O and CURSS:S scores were of primary interest (and not severely skewed), results for CURSS:OI scores have been included primarily for completeness. The distribution of CURSS:OI scores, however, should signal caution when interpreting results for this variable.

Susceptibility Measures: Gender and Treatment Differences

A 2 X 2 (Condition: Prior to Hypnosis/After Hypnosis X Gender: Females/Males) Multivariate Analysis of Variance (MANOVA) with three dependent variables (CURSS:O, CURSS:S and CURSS:OI) yielded a statistically significant main effect for Gender [$F_{(3,194)}=3.20, p < .05$] and a marginally significant main effect for Condition [$F_{(3,194)}=2.58, p=.055$]. Table 15a and 15b present the means and standard deviations, across all variables, for the Gender and Condition main effects. Table 15a and 15b also list the univariate F-ratios associated with each

Table 15a. MANOVA Gender Main Effect: Means, Standard Deviations and Univariate F-Ratios for Susceptibility Measures.

Dependent Variables	Males		Females		Univariate F-Ratio
	<u>M</u>	<u>sd</u>	<u>M</u>	<u>sd</u>	
CURSS:O	2.03	1.74	2.49	1.87	3.27, $p = .072$
CURSS:S	5.22	3.66	7.01	4.79	7.78, $p = .003$
CURSS:OI	.81	1.24	1.23	1.60	4.38, $p = .038$

Table 15b. MANOVA Condition Main Effect: Means, Standard Deviations and Univariate F-Ratios for Susceptibility Measures.

Dependent Variables	Prior to Hypnosis Condition		After Hypnosis Condition		Univariate F-Ratio
	<u>$\bar{X}$</u>	<u>sd</u>	<u>$\bar{X}$</u>	<u>sd</u>	
CURSS:O	2.51	1.93	2.01	1.68	3.86, $p = .051$
CURSS:S	6.94	4.50	5.29	4.03	7.45, $p = .007$
CURSS:OI	1.23	1.61	.81	1.23	4.38, $p = .038$

dependent variable. The standardized coefficients and structure coefficients associated with the Gender and Condition Main effect solutions are reported in Appendix E-2. The intercorrelations among susceptibility measures, broken down by Condition and Gender, are reported in Appendix E-3.

The mean values reported in Table 15a suggested that there is a tendency for females to exhibit higher scores than males across all susceptibility measures. Results in Table 15b suggest that those assessed on Absorption for the second time prior to hypnosis (i.e., Prior to Hypnosis Condition) tended to exhibit higher susceptibility scores (across all susceptibility measures) than those assessed on Absorption for the second time after hypnosis (i.e., After Hypnosis Condition).

The magnitude of Gender and Condition Main effects, however, were quite small. The canonical correlation associated with the Gender main effect was only $R = .22$, suggesting that group membership (i.e., gender) only accounted for approximately 5% of the variance in susceptibility scores. The magnitude of the canonical correlation associated with the Condition main effect was $R = .20$, suggesting that Condition accounted for only about 4% of the variance in susceptibility. Although both main

effects were statistically significant, the magnitude of the effects questions whether results were meaningful.

Absorption: Gender and Treatment Differences

Recall that the Absorption scale was administered twice to both Conditions in this study. *All subjects in Study 2 responded to the Absorption scale during the mass testing session.* All subjects in Study 2 also responded to the Absorption scale during the hypnosis testing session. The critical difference between the two conditions is the time of exposure to the Absorption scale during the hypnosis session (i.e., Prior to Hypnosis Condition-Absorption assessed just prior to susceptibility testing; After Hypnosis Condition-Absorption assessed after susceptibility testing).

Two temporally defined Absorption scale scores for all subjects made it possible to, not only assess whether differences in Absorption scores were associated with Gender and Treatment Conditions, but also whether the context (i.e., Mass Testing/Hypnosis session) in which the Absorption was administered to subjects was associated with differences among subjects' scores. A 2 X 2 X 2 Split-plot factorial,

with two between subjects' factors (Gender: Male/Female; Condition: Prior to Hypnosis/After Hypnosis) and one within subjects' factor (Context: Mass Testing/Hypnosis Session) was performed on Absorption scores. The Source Table for this analysis is presented in Appendix E-4. Neither of the between subjects' main effects nor the Gender X Condition interaction were statistically significant. The main effect associated with the Context in which the Absorption scale was administered to subjects, however, was highly significant [$F_{(1,194)} = 45.7, p < .001$]. The Condition X Context interaction was also significant [$F_{(1,194)} = 4.64, p < .05$]. Interpretation of these statistically significant results, however, was precluded by a statistically significant Condition X Gender X Context interaction [$F_{(1,194)} = 7.746, p < .006$]. Table 16 presents the means and standard deviations for this 3-way interaction. Figure 1a and 1b presents a plot of the means listed in Table 16. Figure 1a plots the Condition X Context Absorption means for females, while Figure 1b plots the Condition X Context Absorption means for males. From the mean values and figures presented, one can see that there is a tendency for Absorption scores to decrease from the first testing session to the second for all four groups. The standard error bars plotted in Figures 1a

Table 16. Means and Standard Deviations for both Mass Testing and Hypnosis Session Absorption Scores, Broken down by Gender and Condition.

Condition	Mass Testing Absorption Scores		Hypnosis Session Absorption Scores	
	$\bar{X}$	<u>SD</u>	$\bar{X}$	<u>SD</u>
<u>Prior to Hypnosis</u> <u>Condition</u>				
Males	78.32	19.27	76.5	16.17
Females	84.92	14.61	79.41	14.45
<u>After Hypnosis</u> <u>Condition</u>				
Males	86.14	17.57	76.46	16.23
Females	85.90	20.07	81.39	19.83

Results for 50 males in each Condition and 49 females in each Condition.

Figure 1a and 1b. Absorption Means and Standard Error Bars for Statistically Significant Condition (Prior to Hypnosis/After Hypnosis) X Gender (Females/Male) X Context (Mass Testing/Hypnosis Session) Interaction.

Figure 1a. Condition X Context for Females

Figure 1b. Condition X Context for Males

and 1b also suggest that the decreases observed may be unreliable. Only for males in the After Hypnosis condition do standard error bars for the two testing sessions fail to overlap. It appears that this group may also be primarily responsible for the significant three way interaction.

Absorption: Test-Retest Reliability

Separate reliability coefficients for males and females within each of the two experimental conditions were computed. As indicated in Table 17, females in the Prior to Hypnosis Condition exhibited the lowest reliability coefficient ($r=.73$). Reliability coefficients associated with the other groups, however, were all approximately $r=.80$.

Although subjects' Absorption scores did exhibit a tendency to decrease from the first testing context (i.e., mass testing) to the second i.e., hypnosis session; see above), all reliability coefficients were of acceptable magnitudes.

Context Dependency Tested

Tables 18a and 18b present the correlations between subjects' Absorption scores and the three susceptibility measures. Both of these

Table 17. For Males and Females in Each Experimental Condition:
Test-Retest Reliability Coefficients for Absorption.

Condition	Males	Females
Prior to Hypnosis Condition	.79	.73
After Hypnosis Condition	.80	.83

Results for 50 males and 49 females in each Condition.

Table 18a. Correlations Between Absorption scores and Susceptibility Scores for Subjects in the **Prior to Hypnosis Condition**.

Subjects	Absorption (Mass Testing) Column 1	Absorption (Hypnosis Session) Column 2
<u>Females</u>		
CURSS:O	.16	.21
CURSS:S	.18	.26
CURSS:OI	.08	.17
<u>Males</u>		
CURSS:O	.08	.26
CURSS:S	.16	.37**
CURSS:OI	.19	.35*
<u>All Subjects</u>		
CURSS:O	.14	.25*
CURSS:S	.21*	.33**
CURSS:OI	.16	.26*

Note: Bracketed correlations represent those used in Between-Subjects tests of the Context Dependency Hypothesis.

* $p < .05$

** $p < .01$

Table 18b. Correlations Between Absorption scores and Susceptibility Scores for Subjects in the **After Hypnosis Condition**.

Subjects	Absorption (Mass Testing) Column 1	Absorption (Hypnosis Session) Column 2
<u>Females</u>		
CURSS:O	.11	.15
CURSS:S	.26	.26
CURSS:OI	.15	.20
<u>Males</u>		
CURSS:O	.21	.27
CURSS:S	.27	.36**
CURSS:OI	.15	.25
<u>All Subjects</u>		
CURSS:O	.16	.21*
CURSS:S	.26**	.31**
CURSS:OI	.15	.23*

Note: Bracketed correlations represent those used in Between-Subjects tests of the Context Dependency Hypothesis.

* $p < .05$

** $p < .01$

tables present two columns of correlations. The first column of correlations in Tables 19a and 19b represent the correlations between subjects' mass testing Absorption scores and susceptibility scores. The second column of correlations in Tables 18a and 18b represent the correlations between subjects' Absorption scores generated during the Hypnosis session and susceptibility scores. Table 18a reports the results for the Prior to Hypnosis Condition and Table 18b reports the results for the After Hypnosis Condition (recall that the time at which subjects filled out the Absorption scale was different for these two conditions). Results for all subjects in a particular condition, as well as results for males and females in a particular condition, are reported.

As one can see, correlation magnitudes for susceptibility measures with Absorption scores were marginal, regardless of the context. Those correlations bracketed in Tables 18a and 18b were used to test the hypothesis that the relationship between absorption and hypnotic susceptibility is context dependent. To test this hypothesis in a manner similar to Council, Kirsch and Hafner (1986) required that one group (Prior to Hypnosis Condition) respond to the Absorption scale just prior to susceptibility testing. The correlations bracketed in Table 18a,

therefore, represent a Within-Context assessment of absorption and susceptibility similar to that of Council, et al. To test the context dependent hypothesis also requires that one group respond to the Absorption scale prior to hypnosis *but in a context different from susceptibility testing* (After Hypnosis Condition). The correlations bracketed in Table 18b represent a Out-of-Context assessment of absorption and susceptibility similar to that of Council, et al.

In answers to criticisms expressed by Nadon, et al. (1991) regarding analysing males and females separately in the absence of gender differences, hierarchical regression analyses were performed with susceptibility measures as dependent variables and gender included as an "independent" variable. None of the three dependent variables produced a Gender X Context X Absorption interaction term that even approached statistical significance ($p > .50$ for all analyses). Therefore, gender was dropped as an independent variable and the analyses were again conducted without this variable.

The analysis approach reported here is identical to that performed by Council, Kirsch and Hafner (1986). Results for all subjects combined are reported in Table 19 (separate analyses for males and females are

Table 19. Summary of Hierarchical Regression Analyses: Testing the Context Dependency Hypothesis for Absorption Scale, All Subjects.

Entry Level	IV Entered	CURSS:O		CURSS:S		CURSS:OI	
		t	p	t	p	t	p
<hr/>							
<u>All Subjects</u>							
1.	ABS	2.25	.03	3.33	.00	2.30	.02
2.	Context	2.61	.01	3.77	.00	2.75	.01
3.	ABS X Context	1.11	.27	1.15	.25	1.50	.13
Overall		R ² = .06**		R ² = .12**		R ² = .07**	

* $p < .05$

** $p < .01$

Note: t-values reported for Absorption and Context do not represent a test of the unique variance shared by these variables and the dependent variable for the interactive model. All t-values in the table represent a test of the contribution of a variable, with all other variable entered previously into the equation controlled. For the interactive model, only t-values associated with ABS X Context represent a test of the unique variance shared with a particular dependent variable.

reported in Appendix E-5). As one can see, the order independent variables were entered into regression analyses was fixed. First, appropriate absorption scores (see Tables 18a and 18b) were entered. Second, a coding vector representing the Context in which absorption was assessed was entered. Effect coding was used, with Within-Context subjects coded 1 and Out-of-Context subjects coded -1. Finally, the interaction term between Context and Absorption was generated and entered last into the regression equation. A test of the interaction term represents a test for contextual effects hypothesized by Council, Kirsch, et al. (1986). In order to reduce the probability of Type II error, test of the interaction was set, a priori, at $\alpha = .10$. Pedhazur (1982) has recommended setting liberal alpha levels when testing interaction terms (e.g., $\alpha = .10$ or $.25$).

Table 19 also includes Overall R^2 values associated with the full interactive model depicted. As one can see, results failed to reveal a context dependency effect and the proportion of variance (i.e., R^2) accounted for by this interactive model was low, particularly for traditional objective susceptibility scores (i.e., CURSS:O).

Since Study 2 did employ a within subjects design, regressed change

analyses, similar to those performed by Nadon, et al. (1991) and Perlini, et al. (1991), were initially calculated separately for the two conditions in this study. Recall that for this analysis, hypnotic context Absorption scores serve as the dependent variable. The relationship between these scores and susceptibility scores is assessed after the variability shared with mass testing Absorption scores has been partialled out (see Cohen and Cohen, 1975 for a description of this approach). For these analyses mass testing Absorption scores were entered at the first step. Stepwise regression analysis then proceeded with CURSS:O and CURSS:S as potential independent variables. For all analyses the mass testing Absorption X Susceptibility interaction was tested before proceeding with regressed change analyses. This interaction, which would have precluded proceeding with the regressed change analysis, was not statistically significant for any of the analyses.

For the Prior to Hypnosis condition, a context effect was observed. At the first step, results indicated that 58.5% of the variance of within context Absorption scores was linearly accounted for by mass testing Absorption scores. The remaining variance (in this case $[1-.585]$ or 41.5%) is variance in regressed change or variance of the residuals.

Stepwise regression results indicated that only CURSS:S was entered and accounted for a statistically significant amount of unique variance

($R^2_{\text{(unique)}}=.029$; $t_{(96)}=2.68$, $p < .01$). This finding indicated that 2.9% of the total variance in hypnosis Absorption scores was uniquely accounted for by CURSS:S scores, which constituted approximately 7% of the variance in regressed change.

It should also be noted that, for this analysis (i.e., Prior to Hypnosis Condition), if CURSS:S scores had not been offered as a predictor, objective (i.e., CURSS:O) scores would have been entered at step two. A test of the beta weight associated with CURSS:O at this step was statistically significant ($t_{(96)}=2.17$, $p=.03$). That is, in the absence of CURSS:S scores, CURSS:O scores would have been entered and uniquely accounted for 1.9% of total variance in hypnosis Absorption scores, which constituted approximately 4.6% of the variance in regressed change.

For the After Hypnosis condition, once the variability shared with mass testing Absorption scores was partialled out of hypnosis Absorption scores (measured after susceptibility testing), stepwise regression analysis failed to enter either CURSS:O or CURSS:S scores.

The beta weight associated with CURSS:S scores at this second step, however, did approach statistical significance ($t_{(96)}=1.92$; $p=.057$).

Since results for CURSS:S approached statistical significance, the proportion of variance in regressed change was assessed. At step one, approximately 65.8% of the variance of within context Absorption scores was linearly accounted for by mass testing Absorption scores. At step 2, CURSS:S scores accounted for an additional 1.3% of the total variance in hypnosis Absorption scores, which constituted approximately 3.7% of the variance in regressed change. A summary of regressed change analyses for both conditions are reported in Appendix E-6.

It would appear from these results that the within subjects' context effect was stronger for subjects who completed the Absorption scale for the second time just prior to hypnotic susceptibility testing, compared to subjects who completed the Absorption scale for the second time after susceptibility testing. To assess this possibility, the regressed change analysis was conducted adding Condition and Condition X CURSS:S as independent variables. As before, mass testing Absorption scores were entered at the first step. The two main effects, CURSS:S and Condition were entered at the second step (at this step, only CURSS:S

was statistically significant). Finally, the Condition X CURSS:S interaction was entered at the third step. A test of the interaction term constituted a test of whether the regressed change variance accounted for by CURSS:S differed across the two conditions. Results indicated that the Condition X CURSS:S interaction failed to approach statistical significance [$t_{(193)}=.145, p=.88$]. Regressed change results for all subjects combined (i.e., collapsing across Condition) indicated that CURSS:S uniquely accounted for 2.28% of the variance of within context Absorption scores (i.e., total variance). This represented 5.99% of the variance in regressed change (.0228/.3803).

Finally, the same analysis was performed adding Condition and Condition X CURSS:O as independent variables. A test of the Condition X CURSS:O interaction term at Step 3 was not statistically significant [$t_{(193)}=-.159, p=.87$]. At step 2, however, the CURSS:O main effect alone was statistically significant. Regressed change results for all subjects combined (i.e., collapsing across Condition) indicated that CURSS:O alone accounted for an additional 1.3% of the variance of within context Absorption scores (i.e., unique proportion of the total variance). This represented 3.4% of the variance in regressed change (.013/.380).

Absorption and Susceptibility: Fan-shaped?

In recent years, some researchers have described the relationship between absorption and susceptibility as "fan-shaped", attributing low correlation magnitudes to the presence of heteroscedasticity (e.g., Spanos, Brett, et al., 1987)¹³. Visual plots of mass testing Absorption scores with CURSS:O and CURSS:S and hypnosis session Absorption scores with CURSS:O and CURSS:S are also presented in Appendix E-7. Bartlett's Box-F test of homogeneity of variance test was used to test whether the relationship between Absorption scores and susceptibility (using CURSS:O) violates the assumption of homoscedasticity. Neither the relationship between mass testing Absorption scores and CURSS:O nor the relationship between hypnosis session Absorption scores and CURSS:O suggested the presence of heteroscedasticity ($F < 1$ for both analyses).

Tests of a nonlinear additive model were also performed although this author does not perceive any theoretical reason to expect this relationship (and scatterplots failed to suggest a curvilinear relationship). Separate curvilinear regression equations were tested with CURSS:O and CURSS:S as the dependent variable. Second and third

degree polynomials were generated separately for within context and out of context Absorption scores (i.e., ABS^2 ; ABS^3). Therefore, a total of four analyses testing a nonlinear additive model were performed. Second and third degree polynomials failed to achieve statistical significance for either susceptibility measure (and both within context and out of context Absorption score produced null results).

Attitudes Toward Hypnosis: Preliminary Results. In order to investigate whether attitudes toward hypnosis moderate the relationship between Absorption and Susceptibility, subjects' responses to the Carleton Attitude scale were used. Before investigating the relationship of absorption and susceptibility at different attitude levels, the distribution of attitude scores for subjects in this study was considered. A 2 X 2 (Condition: Prior to Hypnosis/After Hypnosis X Gender: Males/Females) completely between subjects ANOVA was performed on Total Attitude scores to determine whether there were any systematic variation in attitude scores across groups. Appendix E-8 contains the Summary Table for this ANOVA. Neither the main effects for Condition or Gender nor the interaction of these two variables approached statistical significance.

The zero order correlations of Attitude scores with susceptibility measures and Absorption are presented in Appendix E-9. Overall, correlation magnitudes were unimpressive. The Attitude scores of subjects in only one group produced correlation magnitudes with susceptibility measures that were greater than $r=.30$. The Attitude scores of females who completed all questionnaires prior to susceptibility testing correlated marginally with CURSS:O. The difference between correlations for males and females, however, was not statistically significant.

Attitudes as a Moderating Variable. The approach taken for investigating the moderating effects of Attitudes on the relationship between Absorption and susceptibility scores was similar to that used to look at the relationship of context and absorption to susceptibility. Specifically, hierarchical regression analyses were applied to investigate whether the strength of the relationship between absorption and susceptibility meaningfully varies as a function of attitude levels (i.e., a test of the joint relationship between absorption and attitudes).

Results testing the joint relationship of mass testing Absorption scores and Attitude scores with CURSS:O and CURSS:S as criterion

variables are presented in Appendix E-10. For these analyses, mass testing Absorption scores were used since these scores would not be confounded with hypnosis context effects. Results have been broken down by Condition and Gender. This approach was adopted because testing for gender effects produced a statistically significant Gender X Attitude X Absorption interaction for both CURSS:O ($p < .10$) and CURSS:S ($p < .05$) scores for the Prior to Hypnosis condition.

For males in the Prior to Hypnosis Condition (i.e., attitudes and other measures completed prior to hypnosis), overall R^2 values associated with the overall additive [$R^2_{(add)}=.02$] and the overall interactive model [$R^2_{(inter)}=.03$] failed to achieve statistical significance for CURSS:O. When CURSS:S was the criterion variable, the overall additive model was not statistically significant [$R^2_{(add)}=.05$, $p=.34$]. The Attitude X Absorption product term, however, was marginally significant ($p=.10$) for males in the Prior to Hypnosis Condition, though the overall R^2 associated with this model failed to achieve statistical significance [$R^2_{(inter)}=.10$, $p=.18$]. For females in the Prior to Hypnosis Condition, the overall interactive model was statistically significant for

CURSS:O ($R^2_{(inter)} = .20, p = .02$) and marginally significant for CURSS:S ($R^2_{(inter)} = .16, p = .05$). In both cases the Absorption X Attitude product term was statistically significant at $p < .10$ and "explained" approximately 6% of unique variance in CURSS:O and 7% of unique variance in CURSS:S scores.

Review of the results for males and females in the Prior to Hypnosis condition indicated that the "interactive" pattern for males and females was different. This, of course, was supported by the statistically significant Gender X Attitude X Absorption product term for both CURSS:O and CURSS:S. To review the suggested pattern differences across gender, CURSS:S was selected as the criterion variable (since both females and males exhibited a statistically significant interaction term for this criterion variable).

To avoid dichotomizing the continuous predictor variables, the method used for describing the joint relationship of Attitudes and Absorption with CURSS:S has been taken from Cohen and Cohen (1975). Generally speaking, the presence of a joint relationship or "interaction" suggests that the regression of the criterion on one predictor (i.e., X_2)

depends on the value on another predictor (i.e., X_1). As Cohen and Cohen (1975) state: "each different value we assign to X_1 defines a different [regression] line, thus justifying the conditional formulation (p. 313)." These authors provide a method which allows the calculation of these separate regression lines, based on estimates of X_1 . Comparison of the slopes of these regression lines provides a description of the joint relationship.

To examine the joint relationship of Attitudes and Absorption with respect to CURSS:S, for females and males, Attitudes were selected as the moderating variable. For females and males separately, two separate regression lines from the family of lines associated with the "interactive" model (see Cohen and Cohen, 1975) were calculated, one for a representative Low Attitude value and one for a representative High Attitude value. Since females and males failed to differ on the Attitude scale, selection of the 25th percentile value (to represent Low Attitudes) and selection of the 75th percentile value (to represent High Attitudes) was based on all subjects in the Prior to Hypnosis condition. The following representative lines were calculated for females in the

Prior to Hypnosis condition:

$$\text{Low Attitude (61)} \quad y'_{(\text{CURSS:S})} = .1031(\text{ABS}) - .9667$$

$$\text{High Attitude (79)} \quad y'_{(\text{CURSS:S})} = -.0309(\text{ABS}) + 12.37$$

These lines have been plotted in Figure 2a. Solving for the two unknowns in these equations (i.e., y' and ABS) allowed the point of intersection for the two equations to be determined as indicated in Figure 2a. Vertical hatched lines included in Figure 2a represent Absorption values one and two standard deviations from the mean for females in the Prior to hypnosis condition. These vertical lines help to evaluate whether the intersection of these two lines occurs within the range of values of Absorption scores of interest. Pedhazur (1982; see also Cohen & Cohen, 1975) state that convergence outside the range of interest for an independent variable suggest a ordinal interaction. A ordinal interaction implies that predicted y' values associated with the high and low regression lines differ significantly across values on the X-axis.

As one can see in Figure 2a, the High and Low Attitude regression lines converge at a very high Absorption score, but that this convergence is still within the range of Absorption scores. The result did suggest that, for most Absorption values, particularly low and moderate

Figure 2a and 2b. For Females and Males in the Prior to Hypnosis Condition: Visual Representation of the Joint Relationship of Attitudes and Absorption with CURSS:S as the Criterion.

Figure 2a. Females

Figure 2b. Males

Absorption values, High Attitude subjects exhibited higher predicted CURSS:O scores than Low Attitude subjects. As Absorption scores become more extreme, however, the difference between Low and High Attitude subjects becomes less and less. Figure 2a also suggests that for Low Attitude subjects, Absorption and CURSS:S exhibited a slight positive relationship, whereas these two variables exhibited a slight negative relationship for High Attitude subjects.

This pattern of results was contrary to expectations. Traditional views of attitudes as a moderating variable predict that low attitude scores should be associated with low susceptibility scores regardless of Absorption levels. While lower Attitude female subjects in this condition did have comparatively lower susceptibility scores than higher Attitude females for most values of Absorption, Absorption appeared to enhance the susceptibility level of lower Attitude subjects.

Two separate regression lines from the family of lines for the interactive trend observed for males in the Prior to Hypnosis condition were also calculated:

$$\text{Low Attitude (61)} \quad Y'_{(\text{CURSS:S})} = -.0064(\text{ABS}) + 5.9$$

$$\text{High Attitude (79)} \quad Y'_{(\text{CURSS:S})} = .0900(\text{ABS}) - .94$$

These lines have been plotted in Figure 2b. As one can see, the point of intersection for these two regression lines, as well as the pattern of results for males, differed markedly from females (see Figure 2a). The two representative regression equations for males in Figure 2b are clearly disordinal. Specifically, for males with lower Absorption scores (below the point of intersection) predicted CURSS:S scores were higher for males who also exhibited Low Attitudes than the predicted CURSS:S scores for males who also exhibited High Attitudes. For males with higher Absorption scores (above the point of intersection) this pattern was reversed and more consistent with traditional views of the "moderating" effects of Attitudes. That is, for Low Attitude males, predicted CURSS:S scores were highly similar across all values of Absorption. For High Attitude males, Absorption values exhibited a positive relationship with CURSS:S and higher predicted scores than Low Attitude males for moderate to high values of Absorption. When interpreting results for males, however, one should keep in mind that the proportion of variance accounted for in CURSS:S by this interactive model was marginal and failed to achieve overall statistical significance [$R^2_{(inter)} = .10$, $p = .18$]. Therefore, predicted CURSS:S scores for High and

Low Attitude males may meaningfully differ only for more extreme high and low values on Absorption. For moderate (i.e., middle range) values on Absorption, variation in attitudes scores probably failed to produce meaningful differences in predicted CURSS:S.

The same analyses for females and males in the After Hypnosis Condition (i.e., attitudes assessed after susceptibility testing) were conducted and are also presented in Appendix E-10. For males in the After Hypnosis condition, the overall interactive model for Absorption and Attitudes was not statistically significant when either CURSS:O or CURSS:S was the dependent variable. The overall additive model for these males, however, did produce marginally significant results for both CURSS:O [$R^2_{(add)}=.10$, $p=.08$] and CURSS:S [$R^2_{(add)}=.12$, $p=.05$]. For females in the After Hypnosis Condition, the overall interactive models associated with the two susceptibility measures failed to achieve statistical significance. The overall additive model for CURSS:O also failed to achieve statistical significance [$R^2_{(add)}=.05$, $p = .31$], though the overall additive model with CURSS:S as the dependent variable was marginally significant ($R^2_{(add)}=.10$, $p = .07$). Therefore, the pattern of

results observed for females in the Prior to Hypnosis Condition failed to emerge for females in the After Hypnosis Conditions.

CURSS-Test Suggestion Difficulty and Absorption

Balthazard and Woody (1987) suggested that the magnitude of the relationship between Absorption scores and individual test suggestions increases as a function of the difficulty of test suggestions. To test this hypothesis these authors calculated biserial correlations between Absorption scores and each dichotomously scored (i.e., pass/fail) test suggestion. Biserial correlations were calculated as estimates of what the pearson product-moment coefficient would have been had the dichotomous variable (i.e. objective test suggestion scores) been measured on a continuous scale. Balthazard and Woody, however, did not gather subjects' subjective ratings of their experience during each test suggestion.

Item Difficulty: CURSS:O. Item difficulty was determined by the proportion of subjects who passed a particular test suggestion. The order of CURSS test suggestion, based on item difficulty, was determined separately for males and females in each experimental

condition. The order of CURSS suggestions, in terms of difficulty, was highly similar across the four groups (see Appendix E-11). Rho coefficients comparing the order of difficulty for male and females within the Prior to Hypnosis Condition and order of difficulty for males and females within the After Hypnosis Condition, were .96 and .93 respectively. Rho coefficients comparing order of difficulty for females across conditions and males across conditions also produced high coefficients ($\rho=.81$ and $\rho=.96$ respectively). All coefficients were statistically significant.

Absorption and Individual Test Suggestions. The present study tested Balthazard and Woody's hypothesis that the strength of the relationship between absorption and susceptibility test suggestions increases as a function of item difficulty. Biserial correlations between Absorption (measured within the hypnotic context) and each dichotomously scored CURSS item were calculated. Also available, however, were subjects' subjective ratings for each CURSS item. Recall that subjects rated their subjective experience to each test suggestion on a scale ranging from 0 to 3. The high degree of convergence between CURSS:O and CURSS:S scores has led some hypnosis researches to view

subjective ratings of test suggestions as representing susceptibility, measured on a more continuous scale. Therefore, in addition to biserial correlations, pearson product-moment correlations between subjective test suggestion ratings and absorption scores were also calculated. The results reported in Tables 20a and 20b pertain to all subjects in the Prior to Hypnosis and After Hypnosis Conditions, respectively. The results for subjects, broken down by both Condition and Gender may be found in Appendix E-11. For each CURSS test suggestion, item difficulty, biserial correlations for overt scores and Absorption and correlations for subjective test suggestion scores and Absorption are reported. As one can see there is no evidence to support Balthazard and Woody's hypothesis. The magnitude of biserial correlations does not appear to increase as a function of item difficulty. Correlation magnitudes between absorption and subjective item ratings, while somewhat higher than biserial correlations, also do not support Balthazard and Woody's hypothesis¹⁴.

Table 20a. For Prior to Hypnosis Condition: CURSS Item Difficulty, and Test Suggestion Correlations with Hypnosis Session Absorption Scores.

Prior to Hypnosis Condition

CURSS Suggestion	Item Difficulty ^a	r_{biserial}	r_{pearson}
Arms Apart	.61	.20	.23
Arm Rigidity	.48	.09	.26
Arm Heavy	.46	.25	.34
Arm Rising	.26	.28	.11
Music Hallucination	.28	.12	.18
Kitten Hallucination	.22	.19	.32
Hypnotic Amnesia	.20	.25	.09

^aValues reported indicate the proportion of subjects passing each test suggestion.

biserial - CURSS:O scores for test suggestion with Absorption scores.

pearson - CURSS:S scores for test suggestion with Absorption scores.

Table 20b. For After Hypnosis Condition: CURSS Item Difficulty, and Test Suggestion Correlations with Hypnosis Session Absorption Scores.

After Hypnosis Condition

	Item Difficulty	r_{biserial}	r_{pearson}
CURSS			
Suggestion			
Arms Apart	.50	.06	.24
Arm Rigidity	.38	.24	.22
Arm Heavy	.38	.19	.32
Arm Rising	.33	.20	.24
Music Hallucination	.20	.17	.23
Kitten Hallucination	.07	.16	.14
Hypnotic Amnesia	.15	.10	.03

^aValues reported indicate the proportion of subjects passing each test suggestion.

biserial - CURSS:O scores for test suggestion with Absorption scores.

pearson - CURSS:S scores for test suggestion with Absorption scores.

Exploratory Results: Influence of Hypnotic Context on Expectancy

Ratings

Subjects in both experimental conditions in Study 2 made Expectancy ratings, regarding their subsequent hypnotic performance, just prior to receiving the hypnotic induction and test suggestions. Although all subjects made expectancy ratings prior to hypnosis, the context within which ratings were made varied across the two conditions. For subjects in the Prior to Hypnosis Condition, Expectancy ratings were made after responses to all other questionnaires (including Absorption and Attitude scales) had been completed but before any hypnotic induction. Therefore, before Expectancy ratings were made, these subjects were exposed to questions of obvious theoretical interest to the researcher and to their own responses to these questions. For subjects in the After Hypnosis Condition, the expectancy scale was the only questionnaire subjects were exposed to prior to receiving the hypnotic induction.

Table 21 contains correlations between CURSS:O, CURSS:S and Expectancy ratings. As one can see, the pattern of correlations suggests a stronger relationship between expectancy ratings and susceptibility

Table 21. Expectancy Estimates: Correlations with Subsequent Susceptibility for Females and Males in Each Experimental Condition.

Expectancy with:	CURSS:O	CURSS:S
<u>Prior to Hypnosis Condition</u>		
Females (n=47)	.32*	.30*
Males (n=49)	.41**	.48**
All Subjects (n=96)	.37**	.40**
<u>After Hypnosis Condition</u>		
Females (n=50)	-.01	.04
Males (n=49)	.21	.31*
All Subjects	.10	.15

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

for subjects in the Prior to Hypnosis Condition. For this condition, all correlations between expectancy ratings and susceptibility scores were $\geq .30$. Correlations among susceptibility measures and Expectancy ratings in the After Hypnosis Condition, however, were generally lower in magnitude and not statistically significant (see Table 21). To investigate whether the linear relationship between expectancy ratings and susceptibility scores differed across the two conditions, regression analyses were conducted in order to test Expectancy X Condition interactions. Before formally proceeding, a hierarchical regression analysis was performed with gender included as a "independent" variable. The Gender X Condition X Expectancy interaction was not statistically significant [$t_{(187)}=.13$, $p=.90$]. Therefore, the formal analyses reported here collapsed across gender.

Regression Results. Separate regression analyses with CURSS:O and CURSS:S scores as dependent variables were conducted. Both Expectancy and Condition vectors were entered into regression analyses before the product of these two vectors (i.e., Condition X Expectancy Interaction) was introduced. A test of the Condition X Expectancy product term represents a test of whether correlation magnitudes for

Expectancy and Susceptibility differed across the two conditions.

Regression results for these two analyses are presented in Appendix E-12. Results indicated that the Condition X Expectancy Interaction term was statistically significant (at $p < .05$) for both CURSS:O and CURSS:S. With respect to the correlations listed in Table 21, these findings suggested that subjects in the Prior to Hypnosis condition exhibited statistically significant higher correlations between Expectancy scores and these dependent variables than subjects in the After Hypnosis Condition. Overall R^2 values for interactive models were not particularly large, with the model accounting for 9% of the variance in CURSS:O and 12% of the variance in CURSS:S. The condition (or context) in which subjects made expectancy ratings did appear to influence the relationship between Expectancy scores and subsequent susceptibility. Subjects in the Prior to Hypnosis Condition who completed scales of interest to the researcher (e.g., Absorption scale) were slightly better at predicting their subsequent susceptibility level than subjects in the After Hypnosis Condition.

Discussion - Study 2

One of the primary purposes of Study 2 was to further investigate the hypothesis that measuring Absorption within the context of susceptibility testing is responsible for the positive and statistically significant correlations traditionally reported between Absorption and susceptibility. To test this hypothesis, it was necessary that Absorption scores measured outside the hypnotic context (i.e., Out of Context Group) be available for one group and that Absorption scores generated within the hypnotic context (i.e., Within Context Group) be available for a second group. For this study, Absorption scores generated outside the hypnotic context were available for all subjects, since a pre-requisite for participation in the study was that subjects had completed the Absorption scale during the mass testing session conducted at the beginning of the school year. During this mass testing session subjects were exposed to numerous different questionnaires and then contacted at a much later date for participation in the hypnosis session. It is highly unlikely that these subjects linked the two sessions.

In order to compare the magnitude of the relationship between Absorption scores and susceptibility scores when Absorption is

measured within or outside the hypnotic context, the regression analysis approach adopted by Council, Kirsch, et al. (1986) was the primary analysis of interest. This approach tested whether the Absorption X Context interaction term accounted for unique variance in subjects' susceptibility scores above that accounted for by a mere additive model involving these two variables. A statistically significant interaction term would have suggested that the magnitude of the relationship between Absorption and susceptibility differed across the two contexts.

For this study, the Absorption X Context interaction term failed to reach statistical significance for any of the susceptibility dependent variables (i.e., CURSS: O; CURSS:S; CURSS:OI). This was true even though the test of statistical significance was, a priori, set at $p < .10$ to decrease the probability of committing a Type II error. This finding suggested that the magnitude of the correlation between out of context Absorption scores and susceptibility scores failed to differ from the magnitude of the correlation between within context Absorption scores and susceptibility scores. Consequently, even though, for all subjects combined, within context Absorption and susceptibility score correlations all achieved statistical significance (see Table 18), the

nonsignificant Absorption X Context interaction terms suggested that any difference between within and outside Absorption score correlations with susceptibility scores may be reasonably attributed to chance.

These findings are consistent with Council, Kirsch and Hafner's (1986) results for objective susceptibility scores. In their study they also found the Absorption X Context interaction term to be nonsignificant when objective susceptibility scores were the dependent variable. They did, however, report a statistically significant Absorption X Context interaction term when subjective susceptibility scores were the dependent variable. In their study, however, the magnitude of the within context correlation between Absorption and subjective susceptibility scores was marginal ($r=.31$).

The mixed design for Study 2, however, also made it possible to compare, for the same subjects, correlations between susceptibility and Absorption when measured within and outside the hypnotic context. Since error variance is reduced with within subjects comparisons, this allowed for a more powerful test for context effects. When the two Conditions were analysed separately, a statistically significant context effect was observed for the Prior to Hypnosis Condition and a marginally

significant context effect was observed for the After Hypnosis Condition. These results provided support for the context dependency hypothesis. Further results, however, also indicated that the observed context effect failed to differ across the two groups, despite the experimental manipulation of gathering within context Absorption scores before hypnosis testing in one group and after hypnosis testing in the other group. Council, et al. (1986) have argued that completing the Absorption just prior to susceptibility testing influences subjects' expectancies, which then ultimately determine hypnotic responding. This position suggests that within context correlations between Absorption and susceptibility result because of changes in susceptibility scores, not changes in Absorption scores. Results, however, suggested a marginal context effect for the After Hypnosis Condition. Moreover, as stated earlier, the magnitude of the context effect failed to differ across the two conditions.

To date, three different studies using within subject designs have produced results suggesting that context does influence the magnitude of the relationship between Absorption and susceptibility. Both Nadon, et al. (1991) and Perlini, et al. (1990) produced results suggesting that

subjective and/or objective susceptibility scores account for approximately 7% of the variance in regressed change Absorption scores. The current study found that, for all subjects combined, CURSS:S scores accounted for almost 6% of the variance in regressed change Absorption scores. It would appear that context does influence the relationship of these variables, though the strength of this impact is not particularly strong (as evidenced by marginal within context correlations between Absorption and susceptibility). Unlike previous research, however, Study 2 would appear to have important implications for the interpretation of context effects. Results for Study 2 suggested that context may be influencing subjects' Absorption scores, rather than susceptibility scores, as suggested by Council, et al. (1986).

Further research, however, is necessary to fully understand this issue, since different influences across the two conditions may have produced the same overall result. One possible way of further investigating this issue may be to look at the relationship of regressed change in susceptibility scores to within context Absorption scores (the opposite of the current study). Specifically, such a study would measure susceptibility twice (rather than Absorption). At the second

susceptibility testing, the context would be manipulated by introducing Absorption testing just prior to susceptibility testing. If Absorption scores accounted for a statistically significant proportion of variance in regressed change for susceptibility, it would suggest that completing the Absorption just prior to hypnosis testing influenced susceptibility scores. It should be recognized, however, that such a study would provide just one piece of the overall puzzle. Initial susceptibility testing is likely to provide strong expectations regarding subsequent susceptibility levels, which may prove robust, even in the presence of context manipulations. Depending on the results of such a study, stronger context manipulations, such as emphasizing to subjects the importance of Absorption as a predictor of susceptibility, might be introduced to further tease out whether context is influencing Absorption, susceptibility or both.

Context also exhibited an impact for the exploratory results generated in Study 2, which suggested that the context in which subjects made expectancy ratings influenced the relationship between expectancy and susceptibility scores. Specifically, statistically significant, though moderate correlations between expectancy and susceptibility were

demonstrated by subjects who completed expectancy ratings prior to the hypnotic susceptibility testing, but after responding to questions concerning their involvements in certain experiences and their attitudes toward hypnosis. For subjects in this study who were not exposed to these questions before making expectancy ratings, the relationship between expectancy scores and susceptibility measures not only failed to achieve statistical significance, correlation magnitudes for this group differed significantly from correlation magnitudes for subjects who made expectancy ratings after completing Absorption and Attitude questionnaires.

These findings complement results reported by Council, Kirsch, et al. (1986) concerning how context influences the predictive power of expectations. In their study, pre-induction expectancy ratings made after completing the Absorption scale, but before hypnotic induction, accounted for a moderate proportion of the variance in objective susceptibility scores. Post-induction expectancy ratings, however, accounted for significantly more variance in subsequent hypnotic responsiveness. These results suggested that, as the hypnotic session progresses, the context changes by providing the subject with more

information for self-assessment. As a result, the predictive power of expectancy ratings increases. Consistent with this interpretation, results from Study 2 found that expectancy ratings made prior to hypnosis exhibited no significant relationship to susceptibility when subjects had to make these ratings "cold", that is, in a context that lacked cues concerning expectancy related cognitions. When the context provided subjects with information for self assessment, correlations between expectancy ratings (prior to induction) and susceptibility were significantly higher, though still modest in magnitude. It would appear that, as the hypnotic situation provides the subject with more information, expectancy ratings become more accurate.

According to Kirsch and Council's (1989) Response Expectancy Theory, the correlation between expectancy ratings and hypnotic responding becomes stronger as the hypnotic session progresses because response expectancies are the immediate cause of the hypnotic responses. Consistent with the studies above, these authors do acknowledge that response expectancies and their relationship to subsequent responding can change dramatically as the hypnotic situation changes. Response Expectancy Theory also acknowledges the importance

of subjects' cognitions (termed expectancy related cognitions) in hypnotic responding. However, subjects' thought and behaviour prior to actual responses are viewed as having only an indirect effect on actual hypnotic behaviour. According to Kirsch and Council (1989), the hypnotic context gives rise to expectancy related cognitions which indirectly influence hypnotic behaviour through their influence on a subject's response expectancies. Ultimately, however, it is subjects' response expectancies that immediately cause hypnotic responses to test suggestions.

Response Expectancy Theory rests on the premise that responses to test suggestions within a hypnotic context represent nonvolitional behaviour. Like many state theorists, Kirsch and Council have taken subjects' reports of the "effortless" and "non-voluntary" responding during hypnotic sessions at face value. These reports are viewed as indications of an underlying automatic mechanism that is the actual determinant of the subject's behaviour. Specifically, Kirsch and Council explain the "non-voluntary" behaviour observed in hypnotic sessions with a causal model that is different from the model used to explain voluntary, goal-directed behaviour. Since interpreting the automatic

mechanism as "hypnotic trance" is rejected as unparsimonious, Kirsch and Council argue that response expectancies are the immediate cause of non-voluntary behaviour. The advantage over theorizing the presence of a "hypnotic trance" is that Response Expectancy Theory may be applied to situations, other than hypnosis, where presumably non-voluntary behaviour is observed.

An alternative interpretation of hypnotic behaviour maintains that responses within the hypnotic context are goal-directed and that introducing special processes to explain this behaviour can be misleading (see Spanos, 1982, for a review). From this perspective, the experience of involuntariness so often assumed to accompany hypnotic behaviour is conceptualized as an interpretation applied by subjects to their goal-directed behaviour. Of course, the phenomenological experience of hypnotic nonvoluntariness is often the central focus for both state and non-state theorists. Those who view this behaviour as "truly" non-voluntary, however, sometimes fail to consider that subjects often attribute the cause of hypnotic responding to the self. For example, Spanos, Rivers and Ross (1977) found that almost one-half of the subjects who overtly responded to an arm rigidity suggestion defined

their hypnotic behaviour as primarily a voluntary action. It should be noted that, Kirsch and Council view the subject as voluntarily adopting the hypnotic role. These authors would also probably concede that subjects' expectancy-related cognitions represent voluntary behaviour. Nevertheless, responses to test suggestions are viewed as non-voluntary or automatic.

One important question with respect to Kirsch and Council interpretation, therefore, is: when does an individual's behaviour in the hypnotic context become non-voluntary? Kirsch and Council's presentation of Response Expectancy Theory suggests that hypnotic induction gives rise to important expectancy-related cognitions which the authors imply are under the voluntary control of the subject. If this premise is accepted, the continuity of subjects' behaviour prior to responding to test suggestions makes it difficult to define the point at which voluntary cognitions and behaviour end and non-voluntary cognitions and behaviour begin. Maintaining that a subject's behaviour within the hypnotic context, including responses to test suggestions, is goal-directed avoids this difficulty.

When one assumes that hypnotic responding is goal-directed, the

hypnotic subject is viewed as an active participant in the hypnosis session. Traditionally, hypnotic procedures have suggested to subjects that hypnosis will be experienced as non-voluntary. The content of hypnotic procedures, however, may also be seen as providing cues to subjects concerning the type of responses (i.e., cognitive processes) necessary to "pass" test suggestions. As a result, subjects are given an opportunity, as the session progresses, to actively test their motivation and skill at producing the phenomenological experience of non-voluntary responding. From this perspective, subjects who are asked to assess their expectancies after induction procedures make more accurate ratings regarding subsequent susceptibility because at this point they have more experience with the type of cognitions necessary to pass test suggestions.

Study 3-Introduction

Study 3 was concerned with several different theoretical and empirical issues. Of particular interest was the predictive power of the Absorption scale with scales from two other areas of research where notions of absorption and fantasy involvement have been introduced. Specifically, Stotland and his associates have assigned a major role to fantasy or imaginative involvement in empathic responding. In addition, Hirschman attempted to associate willingness to engage in absorbing experiences with levels of "femininity" as opposed to "masculinity". As will be shown, these two areas of research may also be interrelated.

The interrelationship of these three areas is discussed here within a framework that reinterprets multidimensional scales purporting to assess an individual's degree of masculinity and femininity. Focusing on one of the most popular and widely used scales in this area, Bem's Sex Role Inventory (BSRI; Bem, 1974), the rationale for dropping the constructs masculinity and femininity will be presented. The BSRI factor structure (based on results generated by Pedhazur and Tetenbaum, 1979) will be reinterpreted as providing indirect measures of the degree to which an individual is actively guided by self and/or other oriented

perspectives. This re-interpretation allows a smoother integration with other research areas, such as empathy. In most empathy research, empathic responding is considered to be other oriented behaviour.

The measure of empathic tendency used in this study was the Empathic Concern scale from Davis' Interpersonal Reactivity Index (IRI; Davis, 1983). While the Empathic Concern scale will be the primary focus, results for Davis' other IRI scales are also reported. For the most part, scales of the IRI focus on specific "types" of responses to different interpersonal situations. In addition, Study 3 included Stotland's Denial-Avoidance scale, where agreement with items suggests a lack of affective involvement in interpersonal situations. Finally, subjects in Study 3 also responded to questionnaires purporting to measure Self-Esteem, Private Self-Consciousness, and Self-Actualization. Since these measures were not the primary focus of this research project, discussion of them was brief, and focused primarily on their expected relationship with the major variables in this project.

Masculinity and Femininity

Historically, the concepts of masculinity and femininity have been

implicitly and explicitly tied to the biological dichotomy of male and female. In her review of the development of Masculinity-Femininity (M-F) scales prior to 1973, Constantinople (1973) noted that researchers generally agreed that these concepts were:

"...relatively enduring traits which are more or less rooted in anatomy, physiology and early experience, and which generally serve to distinguish males from females in appearance, attitudes and behavior (p. 390)."

What emerged from this perspective was the assumption that masculinity and femininity should be represented as bipolar opposites on a single continuum. As one might expect, Constantinople found that most researchers prior to 1973 also believed that masculinity and femininity were best represented by items shown to discriminate females from males.

Constantinople questioned not only the major assumptions that had guided M-F scale construction, but also the efficacy of these concepts for either the prediction, control or understanding of behaviour. Her review suggested that the scales in use reliably predicted little more than biological sex (Constantinople, 1973). That these M-F scales often failed to empirically demonstrate unidimensionality is one partial

explanation for these disappointing results. The M-F scales considered by Constantinople had not only demonstrated low internal reliabilities but also low convergent validity. Constantinople concluded that despite general agreement regarding what should be measured, researchers were, in actuality emphasizing different dimensions (both within and across scales) for the concepts of masculinity and femininity. In fact, the diversity of referents used to denote these concepts was one of the findings that led Constantinople to question the utility of masculinity and femininity as guiding constructs.

As noted above, Constantinople also questioned the assumption that masculinity and femininity should be considered bipolar opposites. At the time of her writing, only bipolar M-F scales existed. Although Constantinople found some evidence contradicting the notion of bipolarity, her arguments were primarily theoretical. For example, Constantinople (1973) noted that personality theorists such as Erikson, Jung and Maslow often concerned themselves with the dual possession of characteristics that M-F theorists had treated as "at odds" within their scales. In fact, Constantinople pointed out that the writing of these theorists, "...imply that the healthy adult of either sex will incorporate

characteristics which are generally designated as opposite-sex appropriate by the stereotypes, such as sensitivity in men and self confidence in women (p. 405)." Such an observation not only underscores the problem of treating M-F as a bipolar continuum, but also points to difficulties with the masculinity/femininity labels themselves.

As a response to some of Constantinople criticisms, Bem (1974) and others (e.g., Spence & Helmreich, 1978) developed scales that treat masculinity and femininity as separate and independent dimensions. The Bem Sex-Role Inventory (BSRI; Bem, 1974), presently the most popular scale in this area, was developed by having judges initially respond to 400 adjectives in terms of either their stereotypic appropriateness for a woman in our society or the stereotypic appropriateness for a man in our society. Bem then performed 400 separate t-tests and compared the mean desirability rating for the male target and the female target. Those adjectives for which male desirability ratings were statistically higher than the female desirability ratings comprised the masculinity scale and those adjectives on which female desirability ratings were statistically higher than male desirability ratings were chosen to represent the femininity scale. Those adjectives that failed to attain

statistical significance were considered "neutral".

Sensitive to Constantinople's arguments that behaviour patterns stereotypically associated with a specific gender need not (and probably are not) mutually exclusive, Bem (1974) argued that, theoretically, "masculinity" and "femininity" should be considered independent dimensions. Consequently, the BSRI yields two scores: a Masculinity subscale score and a Femininity subscale score. More importantly, however, Bem (1974) also introduced a method of distinguishing "androgynous" individuals from what she termed "sex-typed" individuals. Sex-typed individuals are those who endorse predominately those adjectives stereotypically associated with their respective gender. Thus, for example, a male high on the masculinity subscale and low on the femininity subscale would be considered sex-typed. This categorization scheme also identifies cross-typed individuals (e.g., a female high on masculinity, but low on femininity). Androgynous individuals were originally identified by Bem as those individuals whose masculinity and femininity "levels" failed to diverge.

Soon after introducing the BSRI, Bem (1977) acknowledged that a distinction should be made between subjects who score high on both the

masculinity and femininity subscales and those individuals who score low on both M-F subscales (see Spence & Helmreich, 1978). As can be seen, Bem's original categorization scheme failed to distinguish between these two response patterns. Spence & Helmreich (1978) suggested that the distinction is important because of results showing, for example, that subjects scoring high on both M-F subscales reported significantly higher levels of Self-Esteem than subjects scoring low on both subscales. (see also Whitley, 1983). Given such results, Spence and Helmreich argued that only those individuals scoring high on both the masculinity and femininity subscales should be categorized as androgynous. They labelled individuals scoring low on both subscales as "undifferentiated", a label Bem also adopted.

Both Bem's BSRI scale and the concept of Androgyny have received extensive criticism in recent years (e.g., Daly, 1978; Locksley & Colten, 1979; Lott, 1981; Myers & Gonda, 1982; Pedhazur & Tetenbaum, 1979). Although Bem appears to have been guided by many of Constantinople's arguments, her insistence on the labels of masculinity and femininity invites many of the same criticisms Constantinople applied to bipolar scales. According to Myers and Gonda (1982), Bem and others appear to

have moved from primarily biological definitions of masculinity/femininity to socio-cultural definitions, which are no less vague. Further, as with bipolar scales, empirical studies attempting to establish the construct validity of these labels have failed. Several studies have found a minimal degree of overlap between item content on the BSRI and both male and female open-ended definitions of masculinity and femininity (Locksley & Colten, 1979; Myers & Gonda, 1982). Finally, the factor analytic results of Pedhazur and Tetenbaum (1979) suggested that masculinity and femininity simply were not good markers for the adjectives that appear to comprise some of the independent dimensions tapped by the overall scale. Although the scale (with some revision) does appear to have a stable factor structure, the adjectives, masculine and feminine, emerged as a separate bipolar factor for both male and female self-ratings.

It is apparent that the appropriateness of masculinity and femininity labels for describing scale content is questionable. Given the long standing value statements society attaches to these labels (Constantinople, 1973; Lott, 1981), the negative consequences of their continued usage may be far reaching. It is important to recognize that

the use of these labels on multidimensional M-F scales may serve to perpetuate the association between certain types of behaviour and biological sex. For example, de Groh (1987) found psychologists and clinicians investigating alcohol misuse often used multidimensional M-F scales (e. g., BSRI) as a guide to their subject's degree of deviation from "sex-appropriate" behaviour. Further, the theoretical interpretation of cross-typed individuals has been problematic. Lott remarked that those researchers using multidimensional M-F scales often described women high on self-reliance and assertiveness as "masculine women", and men high on compassion and tenderness as "feminine men". Given Bem's framework, one is left with the highly value laden statement that cross-typed individuals have internalized the gender identity of the opposite sex. Constantinople warned of the same type of interpretative problems with respect to bipolar ... F scales.

According to Spence and Helmreich (1979), the ultimate justification for "masculinity" and "femininity" labels lies in the demonstration that the clusters of items on multidimensional M-F scales discriminate between the sexes in their self-reports. Lott (1981) and others (e.g., Pedhazur & Tetenbaum, 1979), however, argued that women

and men cannot be dependably distinguished on the majority of attributes comprising multidimensional M-F scales. More importantly, however, Lott pointed out that:

"[although]...our culture systematically attempts to teach one set of behavior to girls and women and another set of (opposed) behavior to boys and men...for us to label the former as feminine and the latter as masculine is to obscure the essential humanness of the behaviors and to dull our appreciation of their fundamental teachability and modifiability (p. 172; Lott, 1981)."

The position held here is that alternative labels may be more appropriate for summarizing some BSRI items. Using Pedhazur and Tetenbaum's (1979) reported factor structure for the BSRI as a guide, revised BSRI subscales have been viewed and tested as indirect measures of the degree individuals are guided by "self" and "other" oriented perspectives.

Revision of the BSRI

One of Bem's theoretical goals in the development of the BSRI was the identification of desirable characteristics presumably associated

with masculinity and femininity in our culture. Bem's empirical method of item selection, however, may have violated her rational criterion that items be culturally desirable characteristics. As Pedhazur and Tetenbaum (1979) noted, basing item selection solely on male-female target differences, "...may have resulted in the inclusion of traits that are not desirable, but, rather, *less undesirable* for one of the sexes (p. 998; italics original)." This may help to explain how items such as gullible, childlike and shy were included on the BSRI-F subscale. The factor analytic results of Pedhazur and Tetenbaum (see also Gaudreau, 1977) suggested that these items are unrelated to other "femininity" BSRI items.

The factor analytic results of Pedhazur and Tetenbaum are presented in Table 22. This table suggests an interpretable factor structure, particularly for a subset of the items previously included on the BSRI-F subscale (i.e., items 22-40). As can be seen, the same 11 "femininity" items (see Table 22) showed high loadings for the self-ratings of both male and female college students. The authors concluded that items such as compassionate, tender, understanding, and

Table 22. BSRI Factor Loadings for Females and Males (From Pedhazur & Tetenbaum, 1979).

Self-Descriptors	Female Factors				Male Factors			
	1	2	3	4	1	2	3	4
16. Aggressive	.674				.667			
17. Acts as a leader	.738				.627			
7. Forceful	.768				.655			
13. Dominant	.687				.648			
9. Has leadership abilities	.731				.568			
20. Ambitious	.502				.533			
19. Competitive	.506				.398*			
11. Makes decisions easily	.464				.360*			
5. Assertive	.770				.680	.451		
6. Strong personality	.689				.632	.466		
1. Self-reliant			.492				.524	
3. Independent	.442		.480				.657	
12. Self-sufficient	.468		.460				.597	
2. Defends own beliefs	.506						.422	
10. Willing to take risks	.437						.405	
15. Willing to take a stand	.615						.588	
18. Individualistic	.519						.431	
22. Cheerful	.423				.426			
24. Affectionate	.545				.646			
28. Sympathetic	.689				.702			
29. Sensitive to needs of others			.679			.687		
30. Understanding	.713				.593			
31. Compassionate	.741				.743			
32. Eager to soothe hurt feelings			.541			.534		
34. Warm	.626				.734			
35. Tender	.727				.755			
39. Loves children	.434				.547			
40. Gentle	.671				.732			
23. Shy	-.422				-.400			
26. Loyal					.422			
36. Gullible			-.480					-.428
37. Childlike			-.461					-.489
14. Masculine			-.507					.416
27. Feminine	.447		.511					-.748

*Marginal loadings consistent with pattern of results for females.

Adjectives not loading above .40 for either males or females. Athletic (M). Flatterable (F); Does not use harsh language (F). Yielding (F). Analytical (M). Soft-spoken (F)

sympathetic reflected an overriding theme of sensitivity in interpersonal situations (Interpersonal Sensitivity).

As can be seen from Table 22, however, the results for Bem's BSRI-M items were more complex. For males, most items previously included on the BSRI-M subscale yielded two factors. Items such as aggressive, forceful, dominant, ambitious appear to reflect a self-oriented perspective with power and control in interpersonal situations optimized for the self. Pedhazur and Tetenbaum labelled this factor Assertiveness. The other factor emerging for males, to be labelled here as Self-Reliant comprised items such as self-reliant, independent, self-sufficient. Here perceptions of one's self-efficacy are reflected. While these two factors might be expected to correlate to some degree, the response pattern of the male subjects suggest at least some degree of perceived independence. In the case of both factors, the notion of the self as central and "in control" is evident. The "self-reliance" items, however, do not appear to imply the necessity of an interpersonal context in which there is a power relationship. It would appear that females may make this distinction to a lesser degree.

Based in part on the factorial complexity of "masculinity" items across the genders, Pedhazur and Tetenbaum rejected the usefulness of the BSRI. Some evidence suggests, however, that some items on the BSRI demonstrate a stable factor structure and that a revised scoring scheme (and interpretation) may prove useful. For example, Gaudreau (1977) published one of the first attempts to factor analyse the BSRI. Pedhazur and Tetenbaum list numerous flaws in the design and execution of her study. Gaudreau not only combined males and females in a single analysis, her sample was also heterogeneous (including clerical workers, supervisors, managers, executives, police officers and women at home). Gaudreau also included three linear dependencies in her factor analysis (subjects' masculinity, femininity and androgyny scores). As a consequence, Pedhazur and Tetenbaum failed to discuss the similarities of Gaudreau's results to their own. With a factor loading cut-off of .40, however, Pedhazur and Tetenbaum's interpersonal sensitivity factor is duplicated almost exactly by Gaudreau. One item (cheerful) failed to load above .40, whereas the vast majority of items (8 out of the remaining 10) produced loadings above .55. Gaudreau's factor structure for the

BSRI-M items matches the structure found for Pedhazur and Tetenbaum's female subjects. The Assertiveness factor items (see Table 22) all showed the strongest loadings (all above .60), as was found for female subjects in Pedhazur and Tetenbaum's study.

Pedhazur and Tetenbaum were correct in noting that Gaudreau's study had numerous methodological flaws. However, the high similarity between their results and Gaudreau's should also have been noted. At the very least, these two studies combined suggest a stable and reliable factor structure across heterogeneous subject samples. In addition, item content of the BSRI has emerged in other research areas. For example, Wiggins and Holzmuller (1978) argued that the BSRI M-F scales show a high degree of overlap with two orthogonal dimensions of a well preceded model of interpersonal behaviour. The "positive" ends of the two orthogonal dimensions to which Wiggins and Holzmuller referred are Dominant- Ambitious and Warm-Agreeable. These authors found that many of the BSRI-F adjectives fell within the Warm-Agreeable vector and many of the BSRI-M items fell within the Dominant-Ambitious vector. This tentative integration of some BSRI items into a more

established area of personality research suggests that the scale does merit further study. Moreover, the immense popularity of the BSRI almost necessitates the investigation of scale revision and interpretation.

Study 3 explored the efficacy of the three subscales suggested by Pedhazur and Tetenbaum's factor analytic results. The inclusion of the Interpersonal Sensitivity factor seems straight forward since the same factor structure emerged for males and females. The treatment of BSRI-M items as two separate (but correlated) factors follows from several considerations. First, the possible distinction being made by Pedhazur and Tetenbaum's male subjects may have some merit. Assertiveness items appear to reflect a subordination of others in relations to the self. This self/other power relationship is not as obvious for Self-Reliant items, suggesting that some divergence among traditionally defined masculinity items may be present. Second, the examples given by Wiggins and Holzmuller as representative of BSRI-M items that cluster toward the Dominant-Ambitious extreme of his interpersonal model are all from Pedhazur and Tetenbaum's

Assertiveness factor (e.g., assertive, ambitious, dominant, forceful).

Lippa (1977-cited in Wiggins & Holzmuller, 1978) also considered the adjectives, dominant and assertive, as the best markers of the BSRI-M subscale. Again both of these items are contained within the

Assertiveness factor only. Finally, there is some tentative evidence that gender differences may emerge when BSRI-M adjectives are divided into two factors instead of one. Pedhazur and Tetenbaum found gender differences on the BSRI M-F subscales only when the adjectives masculine and feminine were included within their respective subscales.

Re-calculations of Pedhazur and Tetenbaum's data suggested that, while their male and female subjects may not have differed on either the Interpersonal Sensitivity or Self-Reliant factors, gender differences were suggested for the Assertiveness factor. As well, Thompson (1989) recently conducted a meta analysis of the factor structure of the BSRI.

Results led Thompson to conclude that: "...the masculine scale was somewhat less invariant than its feminine counterpart (p.187)." For these reasons, a three factor structure was explored.

Reinterpretation of the BSRI

As mentioned in the introduction of this paper, BSRI-Revised scales were used as proxy variables for the degree to which an individual is overtly self and/or other oriented. Gilligan (1982) has suggested that interpersonal orientation (i.e., other and/or self) greatly influences the interpretation that individuals hold of a interpersonal situation and, by extension, their responses to that situation. According to Gilligan a purely self-oriented individual perceives and organizes (structures) others in relation to the self, while a other-orientation views the self in relation to others. More specifically, the former perspective views the self as primary, while the latter perspective views relationships as primary. It should be stressed that Gilligan sees as a developmental goal, a perspective that synthesizes both self and other orientations.

In this study, the Interpersonal Sensitivity scale was used as an indication of the degree to which perceived behaviour is other-oriented. This interpretation has been adopted by researchers in other areas, such as empathy (e.g., Davis, 1983). Assertiveness and Self-Reliant scales were both viewed as indications of the degree to which perceived

behaviour is "self" orientated. Whether future research should focus on a finer discrimination of these scales would depend on the degree to which the scales diverge in their relationship with other variables, including Interpersonal Sensitivity scores. It was expected that Interpersonal Sensitivity and Self Reliance would emerge as independent dimensions. The Assertiveness scale, however, suggests elements of subordinating others in relation to the self, which may be less consistent with high scores on the Interpersonal Sensitivity scale. As a consequence, it was predicted that these scales might not emerge as independent dimensions.

Interpersonal Orientation and Absorption (Fantasy Involvement)

Starting from the premise that masculinity and femininity are bipolar opposites (i.e., dichotomous), Hirschman (1985) made some specific predictions regarding the relationship between scores on multidimensional M-F scales and the frequency with which individual's report involvement (i.e., absorption) in some everyday experiences. Specifically, Hirschman suggested that individuals with higher

"masculinity" scores may seek out (i.e., desire) experiences that permit "rational" comprehension and control of a situation. Those with higher "femininity" scores, however, may seek out (i.e., desire) those experiences that permit emotional self-projection.

Hirschman's measure of absorption consisted of a brief description of absorbing metaphors¹⁵, followed by 13 categories (e.g., watching movies, T.V. and plays; reading novels; dancing; attending a concert). Subjects were asked to indicate for which categories, if any, the absorption description was relevant to them. Consistent with the traditional treatment of multidimensional M-F scales, Hirschman categorized her male and female subjects into four categories (masculinity, femininity, androgynous and undifferentiated). With male and female scores pooled, these categories were determined by M-F subscale median splits. Based on the above interpretation of the behaviour expected from masculinity and femininity subjects, Hirschman predicted that those categorized as feminine would endorse significantly more categories as "absorbing" than those categorized as masculine. A 2 X 4 (Gender X Sex-Role Category) factorial ANOVA produced a significant

main effect for sex role category. Post hoc comparisons revealed that those categorized as feminine ($\bar{X}=7.17$) and androynous ($\bar{X}=7.89$) endorsed significantly more categories than did those subjects categorized as masculine ($\bar{X}=6.60$). Hirschman (1985) concluded that "...high levels of femininity, even when coupled with high masculinity, may contribute to the acquisition of some absorbing and absorbing like experiences (p. 71)."

Although Hirschman did find a statistically significant difference among some of her groups, the Sex-Role Category main effect only accounted for about 2% of unique variance in the dependent variable. This finding may be due, in part, to the loss of information (predictability) associated with categorizing the M-F subscales. A categorization approach decreases sensitivity and may generate misleading results (see Cohen, 1990; Pedhazur, 1982). Predictive power may have been enhanced by keeping the scales continuous. Further, sensitivity may have been increased with a more structured measure of absorbing experiences.

With respect to her interpretation of the scales themselves, Hirschman adopted an uncritical acceptance of traditional M-F referents.

She even took a step backward by describing the concepts as bipolar. Masculinity is described as an indication of "...objectivity, emotional control, the manipulation of people and objects and an independent nature...(p. 66)", while Hirschman (1985) considered femininity to be associated with "...subjectivity, emotional expressiveness, receptivity to external events, and a dependent nature...(p. 66)." The reinterpretation of M-F scales presented here has little more than tangential connection with Hirschman's interpretation of multidimensional M-F scales.

Two other studies, however, have reported correlations between levels of Interpersonal Sensitivity (F-subscales) and measures of "fantasy involvement". Davis (1983) found small, though statistically significant correlations between the Femininity scale of the PAQ (see Spence & Helmreich, 1978) and a fantasy scale generated for use in empathy research (females $r=.15$; males $r=.29$; see also Appendix G for fantasy scale content). However, the proportion of variance shared among the variables for males (8%) and females (2%) was not much better than Hirschman's findings. Lubinski, Tellegen and Butcher (1983) reported on the relationship of the Absorption scale scores to both the

BSRI-F and the PAQ-F. In a mixed gender sample, Absorption scale scores correlated $r=.26$ with subjects' BSRI-F scores and $r=.31$ with subjects' PAQ-F scores. Both of these correlations were statistically significant. These results indicated that scales traditionally labelled as "femininity" do demonstrate a small, though reliable relationship with measures of "fantasy involvement".

An alternative interpretation to that of Hirschman's, however, comes from the area of empathy. Stotland, et al. (1978) suggested that fantasy involvement plays an important role in the development of an "other-oriented" perspective. High fantasizers, according to Stotland may have had extensive practice at taking the role of others and, therefore, feeling the emotions others feel. This type of reasoning may help to explain the small association between an other oriented variable such as Interpersonal Sensitivity and measures of absorption and fantasy involvement.

Extending this interpretation to the self-oriented measures of the revised BSRI, it was predicted that these measures would demonstrate no relationship to levels of fantasy involvement. This prediction was based on the assumption that, for the most part, self and other

orientations are logically independent. This interpretation is contrary to that of Hirschman, but consistent with her results and those of Lubinski, et al. (1983). These authors also investigated the relationship of the Absorption scale to the traditionally defined masculinity subscales of the BSRI-M and the PAQ-M subscales. Both "masculinity" subscales produced near zero correlations with the Absorption scale. The present study was expected to replicate these results.

Empathy

Researchers have varied considerably in the type of responses they have have considered empathic (see Davis, 1983; Stotland, et al., 1978). The general definition of empathy to be adopted here is from Stotland (1969; Stotland, et al., 1978). Empathy is defined as the emotional reaction of an observer resulting from, "...perceiv[ing] that another is experiencing or about to experience an emotion (p. 12; Stotland, et al., 1978)." This definition is more restricted than some other definitions in that the empathic responses of the observer must display an affective component. This is in contrast to definitions of empathy that emphasize cognitive understanding of an "others" emotions and experiences, rather

than emotional involvement (e.g., Bork, 1971; Cline & Richards, 1960; Hogan, 1969; Piaget, 1932; see also Hoffman, 1977 and Stotland, et al., 1978 for reviews). The present study has also been restricted to what Stotland has termed "simple empathy": those affective responses that are similar to (rather than in contrast to) the experiences of the observed other (see Stotland, et al., 1978; p. 12).

There are several reasons for why this restricted definition of empathy has been adopted. First, this definition corresponds closely to what is considered to be an empathic response in our society (i.e., as containing affective and nonegocentric components). Second, numerous researchers have argued that the mere recognition of affect by the observer is insufficient to constitute an empathic response (e.g., Brems, 1989; Hoffman & Levine, 1976; Stotland, et al., 1978). Specifically, Hoffman (1977) has noted that the capacity to vicariously experience another's emotions has been of central importance to theories of social life, moral action, as well as altruistic behaviour. Several studies have found that perceptual accuracy in judging the emotion of a target person is often unrelated to presumed behavioural indices of empathy (e.g., helping behaviour and altruism), whereas affective empathy measures

have shown a relationship to such behavioural indicators (see Hoffman, 1977 and Davis, 1983 for reviews).

Finally, small though reliable gender differences have been reported for empathy measurement scales incorporating an affective component, but not for scales emphasizing recognition of affect. In his 1977 review Hoffman found that when empathy was defined as a recognition of affect, males and females essentially failed to differ. However, in 16 independent samples where empathy was defined as vicarious affective arousal, the mean responses for females were higher than the mean responses for males.

For these reasons, the Empathic Concern measure from Davis' (1983) Interpersonal Reactivity Index (IRI) was the primary measure of empathic tendency. Davis has explicitly defined this subscale as a measure assessing, "...'other-oriented' feelings of sympathy and concern for unfortunate others...(p.114; Davis, 1983)." Items on this subscale reflect the definition of empathy presented here (i.e., emphasis on vicarious affective arousal). Although the index is relatively new, Davis (1982-cited in Davis, 1983) found scores on his empathic concern scale to be strongly related to subjects' emotional reactions following

exposure to a woman in distress. Emotion levels were, in turn, associated with subsequent helping behaviour.

Interpersonal Orientation and Empathy

Until recently, empathy theorists have treated the potential components of empathy (i.e., cognitive and affective) as separate areas of research. Although the definition of empathy adopted here does emphasize the affective component, the importance of subjects' cognitive interpretation should not be overlooked. Those that emphasize the vicarious affective response of the individual have sometimes failed to recognize that subjects' cognitive interpretation of a situation may be an important mediator of empathic responses (e.g., Hoffman, 1975b; Stotland, et al., 1978). Such researchers have often failed to recognize that a distinction may be made between the capacity for nonegocentric thought (as stressed by cognitive theorist) and the cognitive adoption of an other-oriented perspective.

The work of Gilligan (1982) has suggested that one's interpersonal orientation (i.e., other and/or self) will greatly influence one's interpretation of a situation. According to Gilligan, an other oriented

perspective (or schema) leads to an Ethic of Care (rather than Justice), which attempts to minimize hurt and maintain connectedness.

Interpretations from an other-oriented perspective, therefore, will be contextually based, with the maintenance of relationships (rather than the self) as primary. As a consequence, Gilligan suggested that an other-orientation will foster the development of empathy. Some preliminary results from Davis (1983) are consistent with this interpretation.

Since empathy may be viewed as other-oriented behaviour Davis (1983) predicted and subsequently demonstrated a strong relationship between the Empathic Concern scale and his measure of other-directedness (PAQ-F). Empathic Concern scores and PAQ-F scores correlated $r=.58$ for females and $r=.55$ for males. Sample sizes were quite large ($n > 200$ for both males and females) and these correlations were highly significant. It was expected that Study 3 would replicate these results. Specifically, Interpersonal Sensitivity was expected to exhibit a strong relationship with Empathic Concern.

Review of the literature suggests that, unlike traditionally defined "femininity" scales, the relationship of "masculinity" scales to empathy

has not been investigated. When self and other perspectives are discussed they have been treated as dichotomous or inconsistent. (e.g., Hoffman, 1975a). In this study, the relationship of Empathic Concern to the self-oriented measures discussed previously will also be investigated. Since it is subjects' degree of other-orientedness that is presumed critical for empathic responding, it might be predicted that self-oriented measures will be unrelated to levels of Empathic Concern. This prediction arises from the assumption that an individual may possess both self and other orientations (see Gilligan, 1982). For the Self-Reliant subscale this prediction appears straight forward, since it is expected that Interpersonal Sensitivity and Self-Reliance will emerge as independent dimensions. The Assertiveness subscale, however, suggests a self-orientation that may subordinate others in relation to the self. Some individuals high on this scale may state less concern for others. Therefore, it is possible that the Assertiveness scale may be negatively related to Empathic Concern. This prediction, however, should be considered tentative, since the relationship of the Assertiveness scale to the Interpersonal Sensitivity scale has not been established.

Absorption and Empathy

Stotland suggested that one of the basic elements in the process of empathy may be the level of imaginative self-involvement of the observer. Stotland, et al. interpreted the results of two separate experimental studies as support for this hypothesis. In these studies, the perceptual set of subjects were manipulated prior to watching a demonstrator undergo a painful treatment. Subjects' physiological responses were used as an indicator of empathy.

In the first study, subjects (males and females combined) were instructed to either: 1. Watch the demonstrator's physical movements ("Watch Him" condition); 2. Imagine the demonstrator's sensations and thoughts ("Imagine Him" condition), or 3. Imagine what your own sensations and thoughts would be if you were the demonstrator ("Imagine Self" condition). In general, those in the two "Imagine" conditions demonstrated more physiological arousal than those in the "Watch Him" condition. In the second study (all male sample), subjects were instructed to either: 1. Try to experience the same type of emotions as the person receiving the treatment ("Empathize" condition); 2. Try not to experience the same type of emotions as the person receiving the

treatment ("Avoid Empathy" condition); or 3. No manipulating instructions given to subjects ("No Instruction" condition). According to Stotland, while all three groups exhibited physiological arousal¹⁶, no differences among the three instruction conditions emerged. With respect to Study 2, Stotland, et al. (1978) concluded, "...the results do not support the hypothesis that subjects will empathize as a result of being told to do so (p. 49)." Generalizing across Study 1 and 2, Stotland, et al. further concluded that experimentally enhancing empathy levels requires explicit instructions for imaginative involvement (i.e., subjects must be told what to do).

With respect to individual differences, Stotland suggested that those who report higher levels of fantasy in their everyday lives may be more likely to apply this tendency in situations that may arouse empathy. As a result, high fantasizers may be more likely to exhibit an empathic response. In Study 2 reported above, Stotland found a marginally significant correlation ($r=.29$) between his fantasy involvement measure (reflecting the degree individuals adopt the perspective of characters in plays, novels and movies) and physiological arousal (collapsed across experimental groups). In two other studies, where physiological arousal

was measured while subjects watched a painful treatment, fantasy levels correlated to a low but marginally significant degree with arousal (reported in Stotland, et al., 1978). These two studies also gathered post-test data on the degree to which subjects imagined how the demonstrator felt during the experiment and the degree to which they imagined how they would feel if they were the demonstrator. In one study (mixed gender sample) fantasy levels failed to correlate with either of these post-test measures. In the second study (all female sample), however, the correlations for post-test measures and fantasy levels were quite high ($r=.63$ and $r=.51$ respectively).

These results are cited by Stotland, et al. as support for the predictive validity of fantasy involvement, particularly when empathy is measured via physiological arousal. There are several caveats, however, with respect to Stotland's interpretation of these results. For example, whether subjects demonstrate more physiological arousal (while watching a painful demonstration) when instructed to Imagine versus when instructed to Empathize was not directly tested by Stotland. Therefore, his conclusion that subjects, in general, must be explicitly told what to do in order to enhance empathic responses in experimental

situations is unfounded. More importantly, however, while physiological arousal may be indicative of an empathic response, it may also be associated with other experiences during the experiment (e.g., fear that the same procedure would be applied to them; see also Krebs, 1975 for a critique of these studies).

Other results from the last two studies reported above indirectly suggest that experiences, other than empathy, may be contributing to the relationship of fantasy levels to physiological arousal. Unlike Stotland's fantasy measure, two measures of simple empathy (Stotland's Involvement-Concern and Friend-Empathy scales) were unrelated to physiological measures of arousal. Stotland failed to address why his fantasy scale, as opposed to his more explicit empathy measures, would be predictive of arousal. While imaginative involvement (i.e., Absorption) may be an important process underlying empathic responses, whether a measure of general involvement levels will effectively predict empathy remains to be demonstrated.

The intuitive appeal of Stotland's arguments, however, has persuaded some researchers. For example, Davis (1983) has included a measure of fantasy involvement levels (similar to Stotland's) in his IRI.

Davis found, however, that the shared variability of his Fantasy scale and his Empathic Concern scale to be only around ten percent. This general finding held for both males and females across two large samples. One possible explanation for these results is that the range or intensity of involvement experiences tapped by Davis' measure of fantasy involvement is too restricted. Effectively determining subjects' differential levels of involvement may require a measure tapping a broader range of involvement experiences. Of interest in this study, therefore, was the magnitude of the relationship between subjects' Absorption scores and Empathic Concern scores. These were also compared to the correlation magnitudes of Davis' Fantasy scale and Empathic Concern. It may be that only involvement in certain types of situations will show a relationship to empathy.

If lower correlations persist for fantasy measures and Empathic Concern, this may provide evidence for the presence of an important intervening variable. For example, an other oriented perspective may be necessary before individuals apply their representation system in ways that arouse empathy. Within this framework, imaginative involvement "tendencies" may be better construed as influencing the intensity of

empathic experiences.

Other Measures from Empathy Research

In Study 3, subjects' responses to Davis' entire Interpersonal Reactivity Index were gathered. This approach was adopted, in part, to maintain the continuity of Davis' IRI format. As a result, this study had access to scores on two other IRI scales: Perspective Taking and Personal Distress. Davis has argued that all of his scales fit a broad definition of empathy as the reactions of an observer to the observed experiences of another. As will be shown, however, the content of Davis various scales diverge substantially. Brief reviews, as well as predictions associated with these scales are presented below. In addition, subjects in Study 3 also responded to Stotland's Denial-Avoidance scale, which assesses subjects' expressed tendencies not to adopt the perspective of another.

Perspective Taking Scale. Davis described his Perspective Taking scale as a measure of the tendency to adopt the psychological viewpoint of an other. Davis believes that Perspective Taking scores reflect the capacity for nonegocentric thought, a dimension cognitive theorists have considered central to empathic responding. Unlike

Empathic Concern levels, however, Davis (1982) found Perspective Taking to exhibit no direct relationship to either subjects' emotional reaction after observing a woman in distress or their subsequent helping behaviour. Consistent with these divergent behavioural results, Empathic Concern and Perspective Taking scores exhibited only a modest relationship with each other. These variables correlated $r=.30$ and $r=.38$ in two separate samples of female subjects ($N=378$ and $N=235$ respectively). For males Empathic Concern and Perspective Taking correlated $r=.33$ and $r=.32$ in two separate samples ($N=392$ and $N=225$ respectively).

In Davis' 1983 study, the Perspective Taking scale also demonstrated only a modest relationship with the PAQ-F scale. These two variables correlated only $r=.33$ for females and $r=.37$ for males. While these relatively low correlation magnitudes may be attributed to the imprecision of the measurement scales, an alternative explanation may also have some merit. One might argue that the items on Davis' Perspective Taking scale (see Appendix G) reflect an integration of self and other perspectives. Positive responses to items on the scale suggests that individuals give weight to all perspectives in an

interpersonal situation (including their own). Those who are primarily other-oriented may be exhibiting more variability in their responding on the Perspective Taking scale as a consequence of differential levels of self-orientation. If this is the case, the joint relation of self and other orientation measures may exhibit a stronger relationship with Perspective Taking scores than a mere additive model.

Consistent with the findings of Davis, it was expected that subjects' Interpersonal Sensitivity scores would exhibit a modest relationship with Perspective Taking scores. Since it is assumed that an other oriented perspective may be necessary (but not sufficient) for successful Perspective Taking, it was expected that Self-Reliant scores alone would be unrelated to Perspective Taking. Of particular interest, however, was the predictive power of the joint relationship of Interpersonal Sensitivity and Self-Reliance (i.e., product term). If the reasoning presented above has some validity, then the product term of these two variables should share unique variance with Perspective Taking scores. Use of the Self-Reliance scale as opposed to the Assertiveness scale arose from predictions that the Self-Reliance and

Interpersonal Sensitivity would emerge as independent dimensions, while the Assertiveness and Interpersonal Sensitivity might not. Perspective Taking was expected to be either unrelated or negatively related to the Assertiveness scale.

With respect to the relationship of imaginative involvement measures and Perspective Taking, results were expected to replicate those of Davis (1983). In two separate samples, Davis' Fantasy and Perspective Taking scales failed to meaningfully correlate for either males or females (all four correlations $r < .15$). These results are not surprising given that, from a theoretical standpoint, imaginative involvement is presumed to contribute to the affective response associated with empathy (Stotland, et al., 1978). Perspective Taking items do not include the affective component reflected in, for example, Empathic Concern items.

Personal Distress. Unlike the Empathic Concern scale, Davis described high scores on his Personal Distress scale as indicating a strong tendency toward a particular type of emotionality characterized by fearfulness, uncertainty and vulnerability (p. 121; Davis, 1983). In Davis' study, Personal Distress scores exhibited their strongest

relationship to measures of shyness, social anxiety, fearfulness as well as being negatively related to self-esteem. Also unlike the Empathic Concern scale, Davis considered items on the Personal Distress scale to reflect "self-oriented" feeling of personal anxiety when faced with a tense interpersonal situation.

As support for his notion that the emotionality expressed in Personal Distress items should be viewed as "self-oriented", Davis noted that Personal Distress scores were unrelated to his measure of other-directedness (i.e., PAQ-F). As further support Davis noted that Personal Distress scores were also unrelated to Empathic Concern scores and exhibited a small negative relationship with Perspective Taking scores. Again these patterns of results were exhibited for males and females across two separate samples (though the negative relationship between Perspective Taking and Personal Distress scores was somewhat stronger for females than for males).

Most of the items on the Personal Distress scale are concerned with an individual's perceived capacity to act when faced with another person in distress. Since positive responses to most Personal Distress items suggest a failure to respond effectively in emergency situations, it is

not surprising that the scale exhibited a strong negative relationship with two separate measures of self-esteem in Davis' study. An alternative interpretation to that of Davis', however, is that the distress exemplified by Personal Distress items may be initially motivated by other oriented feelings of concern. One might argue that those with higher Personal Distress scores are empathizing, but that their perceived inability to effectively act in ways that may alleviate the others hurt may exacerbate their emotional response to the situation. That Personal Distress scores failed to correlate with either Empathic Concern or PAQ-F scores does not necessarily contradict this interpretation. Neither Empathic Concern nor the PAQ-F in Davis' study were systematically related to self-esteem measures. Consequently, whether an other oriented individual expresses feelings of personal distress may be dependent on their level of self-esteem. Unfortunately, both of these interpretations predict the same pattern of results. Therefore, whether Personal Distress may be initially motivated by feeling of concern for an other or motivated by self oriented feelings of fear and insecurity is not testable in this study. The former interpretation is simply offered as an alternative. It is possible, of course, that both interpretations have

some merit.

Denial-Avoidance Scale. Responses to Both Davis' Empathic Concern and Perspective Taking scale are directionally similar in that affirmative responses are interpreted as positively related to an other oriented perspective. Stotland, et al. (1978), however, introduced a scale where agreement with scale items implies, according to the authors, a defense or resistance against empathy. Labelled Denial-Avoidance, this scale contains items, such as: "I seldom get deeply involved in the problems and experiences of others"; "I feel other people ought to take care of their own problems themselves" (see also Appendix 1). In two of his laboratory studies, Stotland, et al. reported that Denial-Avoidance scores were marginally related to levels of relaxation while watching a demonstrator undergo a painful treatment (i.e., high deniers showed slightly more relaxation during the treatment). According to Stotland, et al., high deniers in both studies also imagined less how the demonstrator felt ($r=.33$; $r=.36$; $p < .05$) and imagined less how they would have felt had they been the experimenter ($r=.42$; $r=.30$; $p < .05$; see Stotland, et al., 1978; p. 37).

Given Stotland's theoretical definition of his Denial-Avoidance

scale (i.e., as measuring resistance against empathy) it was predicted that Denial-Avoidance would exhibit a strong negative relationship with Empathic Concern. Stotland also predicted, and his empirical results suggest, that the tendency to become imaginatively involved may demonstrate a negative relationship to Denial-Avoidance.

Since affirmative responses to Denial-Avoidance items suggest an explicit lack of concern for the perspective and experiences of others, it was expected that this scale would demonstrate a strong negative relationship with Interpersonal Sensitivity. Whether Denial-Avoidance demonstrates any systematic relationship to either self oriented measures is unclear. Tentatively, it was expected that Denial-Avoidance would be unrelated to self oriented measures, particularly Self-Reliance, since it appears that it is level of other directedness that is the determinant of lower Denial-Avoidance scores.

Gender Differences. Davis (1983) reported that females in his study exhibited significantly higher scores than males on all Interpersonal Reactivity Index scales. Unfortunately, mean values and standard deviations were not reported. Given the large samples of males and females involved in the study ($n > 200$ for both genders), it is

possible that "trivial" differences emerged as statistically significant.

Recently, Riggio, Tucker and Coffaro (1989) partially replicated these results finding statistically significant differences for males and females on all IRI subscales, except Perspective Taking. For all statistically significant results, mean values for females (n=27) were higher than mean values for males (n=27).

Davis' suggestion that gender differences existed for his Empathic Concern scale is consistent with general trends in the area of empathy (see Hoffman, 1977 for a review). Gender differences have also emerged for the Denial-Avoidance scale. Stotland, et al. (1978) found the mean Denial-Avoidance scores of 292 females ($\bar{X}=14.2$; $sd=4.8$) to be significantly lower than the mean scores of 224 males ($\bar{X}=17.8$; $sd=5.0$). The magnitude of this difference is rather impressive when compared to the magnitude of gender differences for other empathy related measures.

Consistent with Davis' and Stotland's reported results, statistically significant gender differences were expected for the empathy related measures (particularly Empathic Concern and Denial-Avoidance). The magnitude of differences, however, were of particular interest and guided interpretations of whether differences should be considered

meaningful. Furthermore, it was not expected that gender would emerge as a moderator variable, though analyses were conducted to explore this possibility. Specifically, it was expected that the pattern of relationships among variables would be the same for males and females.

Study 3: Other Measures

In addition to the scales discussed thus far, subjects in Study 3 also responded to Rosenberg's (1965) Self-Esteem scale, Fenigstein, Scheier and Buss' (1975) Self-Consciousness scale and a recent scale developed by Jones and Crandall (1986) purporting to measure Self-Actualization. As mentioned previously, these areas of research were not of primary interest to this research project. Discussion of these variables, therefore, will be brief.

Self-Esteem

Bem's suggestion that individuals high on both masculinity and femininity (i.e., androgynous) may be better able to cope with diverse situations than sex-typed individuals led to predictions that "androgynous" subjects will exhibit higher levels of "psychological

well-being" than sex-typed subjects. Measures of self-esteem have emerged as the most commonly used indicator of psychological well-being. Although many studies have demonstrated that subjects categorized as androgynous exhibited higher levels of Self-Esteem than those categorized as feminine and undifferentiated, those categorized as masculine also exhibited higher levels of self-esteem than subjects in these latter categories. This has led to the suggestion that it is predominately the masculine component of androgyny scores that are responsible for higher levels of self-esteem (e.g., Taylor & Hall, 1982; Whitley, 1983). In a meta-analysis of research results for self-esteem and multidimensional M-F scales, Whitley (1983) found that, on average, "masculinity" scores accounted for approximately 27% of unique variance in self-esteem measures (i.e., after controlling for "femininity"), while "femininity" levels accounted for only about 3% of unique variance in self-esteem (i.e., after controlling for "masculinity").

Within the present framework, it is assumed that a self-oriented perspective starts from the premise that the self is primary. Although self-esteem measures vary widely, items have been primarily concerned with an individual's perceived status of or contentment with the self.

Therefore, if an individual successfully engages in behaviour that reinforces self-efficacy, it is not surprising that self-oriented measures (i.e., "masculinity" measures) and self-esteem share common variance. While the successful execution of other-oriented behaviour may also contribute to positive self-concept (i.e., self-efficacy in relation to others), it appears that self-esteem measures have not been designed to measure the possible positive aspects of interpersonal success.

Alternatively, as Kelly and Worell (1977) have pointed out, behaviour traditionally associated with masculinity scales may have a greater potential for reinforcement in our society. From this perspective, those who engage in self-oriented behaviour, as opposed to primarily other-oriented behaviour, interpret their behaviour as successful and appropriate because the rewards of society are incurred for such behaviour. Since self-oriented behaviour conforms more closely to socially accepted ideas of what is necessary for success, self-oriented individuals exhibit correspondingly higher levels of self-esteem.

In this research project I proposed an alternative and, as yet

untested, scoring scheme for both traditionally defined masculinity and femininity items. Consistent with previous research results, however, Self-Esteem scores are expected to exhibit a strong positive relationship with both measures of self orientation. It is also expected that, despite the "purer" measure of Interpersonal Sensitivity, the other oriented measure will exhibit at best only a weak relationship with Self-Esteem.

Exploratory analysis of the joint relation of self and other oriented measures have also be included. For a subset of studies ($n=8$), Whitley found the $\bar{X}$ effect size of masculinity, femininity and the product term of these two variables all to be significantly associated with self-esteem. The magnitude of effects associated with femininity and the "interaction" term, however, were small and Whitley questioned the meaningfulness of the results.

Self-Consciousness

Fenigstein, Scheier and Buss (1975) introduced a scale designed to assess the different degree to which individuals engage in the process of self-focused attention (i.e., self-consciousness). The authors argued

that the process of self-focused attention may be inferred:

"When the person is focusing on his thoughts, feelings, behaviors or appearance; when he is reflecting, fantasizing, or daydreaming about himself; or when he is making decisions or plans that involve himself (p. 522; Fenigstein, et al., 1975)."

In conjunction with the development of the Self-Consciousness scale, factor analytic results for their initial item pool identified three stable and largely orthogonal dimensions. According to the authors two of the dimensions suggested that self-consciousness has two major components, one private and one public. The focus of Private Self-Consciousness is on thoughts and reflections that deal solely with the self (e.g., "I reflect about myself a lot."). In contrast, Public Self-Consciousness items focus on an individual's awareness and concern over the self as a social stimulus (e.g., "I'm very concerned about the way I present myself."). Both private and public self-consciousness involve the process of self-focused attention. According to Fenigstein, et al. the third factor to emerge, labelled Social Anxiety, refers to an individual's reaction to the process of self-focused attention. Items on this scale reflect a discomfort in the presence of others (e.g., "I feel anxious when I

speak in the presence of others."). The authors argued that public self-consciousness may be a necessary antecedent of social anxiety.

Of particular interest in this research project was the relationship of Private Self-Consciousness to imaginative involvement levels. The degree to which individuals become absorbed in everyday experiences may influence the degree to which they focus their attention on themselves. Many of the items on the Private Self-Consciousness scale, however, reflect thought processes that seem incongruent with the "nonanalytic" flavour of Absorption items. Although "the self" is the object to which individuals apply their representational system during self-focused attention, the goal of many Private Self-Consciousness items appears to be planning, problem-solving, and self-understanding. Given this divergence in emphasis, it is expected that scores on the Private Self-Consciousness scale and the Absorption scale will exhibit only moderate correlations, at best.

Davis investigated the relationship of Public Self-Consciousness and Social Anxiety to the different scales of his IRI. Given that Public Self-Consciousness emphasizes sensitivity or awareness of others only in terms of the consequences for the self, Davis expected an inverse

relationship between Public Self-Consciousness and Perspective Taking scores. Contrary to expectations, Public Self-Consciousness scores failed to meaningfully correlate with any of Davis' IRI scales. As one might expect, Social Anxiety scores exhibited meaningful correlations with Davis' Personal Distress scale ($r=.39$ females; $r=.43$ males) only. The results of the present research project were expected to replicate Davis' results. Private Self-Consciousness was also not expected to correlate with any of Davis' measures.

Self-Actualization

Self-actualization has often been advanced as a positive conception of mental health (Cofer & Appley, 1964; Maslow, 1962, 1970; Rogers, 1963; Shostrom, 1964). Self-actualized people are seen as in the process of maximizing their full potential. In recent years, a variety of scales have been introduced that purport to measure self-actualization. Although the content of scales is quite diverse, the concepts of inner or self directedness and other directedness have continually emerged (Jones & Crandall, 1986; Knapp & Knapp, 1978; Riesman, Glazer & Denney, 1950; Shostrom, 1964). Although the importance of a positive

self-orientation is often dominant in discussions of self-actualization, the importance of a positive other orientation has also been stressed. For many theorists, however, it appears that the "stage" of self-actualization is qualitatively different from a perspective dominated by either a self or other orientation. This suggests that the joint relation of these two perspectives may show a stronger relationship to measures of self-actualization than a mere additive model.

Recently Jones and Crandall (1986) introduced a short index of Self-Actualization, a modified version of Shostrom's Personal Orientation Inventory (POI) which is one of the most widely accepted measures of self-actualization. The authors argued that the extensive length and cost of the POI may preclude use of this measure in many research areas. Jones and Crandall's Self-Actualization Index has shown a moderate degree of convergence with the POI and has successfully discriminated among 18 matched pairs of individuals nominated either as self-actualizing or nonactualizing.

It should be stressed that use of Jones and Crandall's Self-Actualization Index in this research project is purely exploratory.

The scale is very new and, unlike other measures of self-actualization, contains only 15 items. While the development of a short index was the goal of the authors, reliability of the scale may have been sacrificed. After a 12-day interval, the test-retest reliability of the scale was only $r=.69$. The authors argued, however, that their scale's reliability is comparable to longer versions of self-actualization scales. Further, assuming that the scale has some validity, it was unclear whether using this scale with a college population would be meaningful. It may be that only a very small proportion of introductory psychology students (if any) have reached the "stage" of self-actualization. These caveats were important when interpreting research results.

The Self-Reliant and Interpersonal Sensitivity scales were used as the measures of self and other orientations. The choice of the Self-Reliant scale over the Assertiveness scale seemed obvious, particularly after investigating the list of descriptive adjectives a group of psychotherapists used to describe "Self-Actualized" persons (see Shostrom, 1964). Descriptives similar to both Interpersonal Sensitivity adjectives (e.g., giving, helpful, warm, empathetic, sensitive, sympathetic, feeling) and Self-Reliant adjectives (self-assured,

independent, reliable, competent, capable) were included. The adjectives included on the Assertiveness scale, however, were conspicuously absent from the list of adjectives used to describe a "self-actualized" person.

The tentative prediction put forth was that the joint relation or "interaction" of self and other measures would account for more variance in self-actualization scores than a purely additive model. It should be noted that one study (Ginn, 1975) attempted to look at the relationship of the BSRI to a self-actualization measure. Given Bem's suggestion that "androgynous" individuals may be either "masculine" or "feminine", depending on situational demands, Ginn hypothesized that the androgynous person would be better adjusted or self-actualized in comparison to individuals defined as either masculine or feminine. Unfortunately, Ginn trichotomized subjects' scores into three groups based on Bem's old method of t-ratios. This method lumps together individuals traditionally defined as androgynous and undifferentiated. As might be expected, given this approach, the self-actualization scores of androgynous subjects' were no higher than the scores of those categorized as "masculine" or "feminine". It was hoped that the procedure adopted here would prove more sensitive.

Method-Study 3

Subjects and Procedure

During Carleton University's mass testing session (1987-88) 258 females and 256 males with English as their first language responded to the Absorption and BSRI scales. At a later date, attempts were made to contact these subjects by telephone to participate in an Experience Survey. The researcher varied the time and days of recruitment, with call backs being conducted, if necessary. Subjects that were contacted were informed that the Experience Survey contained questions about some of their everyday experiences and self-perceptions. No mention of the mass testing session was made. A total of 103 females and 101 males participated, receiving either course credit or \$5.00 for their participation.

As suggested above, Absorption and BSRI data were available for those subjects not participating in the Experience Survey. Where appropriate, results for these variables for subjects not participating in the Survey have been reported (see Results section). This sample served as a Comparison sample for Absorption and BSRI results.

For those willing to participate in the Experience Survey, a time

was scheduled for completing the Experience Survey. Before completing the questionnaires associated with this session, subjects were asked to read and sign an obligatory consent form (see Experience Survey: Cover Page-Appendix H). All subjects were informed that their responses were voluntary and would be kept confidential. During this session, subjects completed a set of questionnaires, which were presented in the following order: 1. Interpersonal Reactivity Index; 2. Self-Actualization scale; 3. Denial-Avoidance scale; and 4. Self-Esteem scale. After completion of the Experience Survey, subjects were debriefed, asked not to discuss the content of the Survey to anyone who might participate and then thanked for their participation.

Materials

As described above, subjects' responses to the following questionnaires were gathered during one of two session. Some questionnaires were given to subjects during the mass testing session, while others were given to subjects during the Experience Survey session.

Absorption Scale. All subjects in Study 3 completed the

Absorption scale during the mass-testing session. A description of the Absorption scale may be found under Materials-Study 1 (see also Appendix A).

Bem Sex-Role Inventory. All subjects in Study 3 completed the BSRI during the mass-testing session. The BSRI contains 60 descriptive adjectives Bem (1974) categorized as masculine (N=20), feminine (N=20) and neutral (N=20). Bem's original presentation and scaling format was adopted. For this scale, subjects responded to each adjective in terms of a 7-point scale with extreme anchors of "never or almost never true" (1) and "always or almost always true" (7). All relevant adjectives are scored in the same direction. Appendix F contains the lists of the adjectives that were used to define the Interpersonal Sensitivity, Assertiveness and Self-Reliant scales. A copy of the BSRI, as it was presented to subjects, is included in Appendix G.

Interpersonal Reactivity Index. The IRI was presented to subjects during the Experience Survey session. Davis' IRI is a 28-item self-report questionnaire consisting of four 7-item subscales each tapping different aspects of potential responses in interpersonal situations. Davis has labelled his four subscales: Empathic Concern

(tendency to experience nonegocentric affective arousal when faced with others less fortunate than the self); Perspective Taking (tendency to consider an others point of view in interpersonal situations); Fantasy (tendency to experience the feelings and actions of characters in books, movies and plays); Personal Distress (tendency toward detrimental emotional reactivity when faced with emergency situations). The IRI includes a 5-point scaling format ranging from 0 (Does Not Describe Me Well) to 4 (Describes Me Very Well). Appendix I includes all items on the IRI organized by scale. Most of the items comprising IRI scales are positively keyed. As indicated in Appendix I, however, some items are reverse scored. A copy of the IRI, as it was presented to subjects may be found in Appendix J.

Denial-Avoidance. This scale was included in the Experience Survey. The Denial-Avoidance scale (from Stotland, et al., 1978) contains 9 items measuring subjects failure to become involved in interpersonal situations. All items are positively keyed, with high scores indicating high denial. Denial-Avoidance items were embedded in the short form of Stotland's Empathy Scale. This scale contains 12 items, three of which are Denial-Avoidance items. All items were measured on

a 4 point scaling format, ranging from 1 (Agree) to 4 (Disagree).

Appendix K includes a list of Denial-Avoidance items and Appendix L includes a copy of Stotland's revised Empathy scale, as it was presented to subjects.

Self-Consciousness. Subjects responded to the Self-Consciousness scale (Fenigstein, Scheier and Buss, 1975) during the mass testing session. The Self-Consciousness scale contains 23 items defining three subscales: Private Self-Consciousness (the degree to which one attends to inner thoughts and feelings about the self; n=10 items); Public Self-Consciousness (the degree to which an individual is aware of the self as a social object; n=7 items), and Social Anxiety Self-Consciousness (the degree to which an individual is uncomfortable in interpersonal situations; n=6 items). All Self-Consciousness subscales were measured on a 5 point scaling format ranging from "Extremely Uncharacteristic" (0) to "Extremely Characteristic" (4) for each item. Appendix M includes all Self-Consciousness items organized by subscale. A copy of the overall Self-Consciousness scale, as it was presented to subjects, may be found in Appendix N.

Self-Esteem. Rosenberg's (1965) 20-item Self-Esteem

questionnaire was included in the Experience Survey. This scale has been described as a "global" measure of self-esteem (see Whitley, 1983).

Rosenburg's Self-Esteem measure includes a 4 point scaling format, ranging from 1 (Almost Never) to 4 (Almost Always). All items are positively keyed, with high scores indicating high self-esteem. A copy of this scale, as it was presented to subjects, may be found in Appendix Q

Self-Actualization. Jones and Crandall's (1986)

Self-Actualization scale was included in the Experience Inventory. This questionnaire contains 15 items and a 4-point rating scale ranging from "Agree" (1) to "Disagree" (4). Approximately half of the items on this scale are positively keyed, with agreement being scored as "self-actualizing". Disagreement with the remaining items is scored as "self-actualizing". Appendix N contains a list of positively and negatively scored self-actualizing items and Appendix Q contains a copy of the questionnaire, as it was presented to subjects.

Results - Study 3

Preliminary Considerations

Missing Values. Ninety-four of the 103 females and 88 of the 101 males completed all questionnaire items for Study 3. Of those with missing data, most failed to complete at most two items. For these subjects, mean value estimations for a particular item were used. Appropriate mean values were determined for females and males separately. There was, however, one female subject who failed to complete all Self-Consciousness subscales and one female subject who failed to complete the Denial-Avoidance Questionnaire. Instead of dropping these subjects from all analyses, they were dropped only from those analyses involving these variables. Therefore, for analyses involving the Self-Consciousness subscales and the Denial-Avoidance questionnaire, results for females were based on 102 subjects.

Distribution of Variables. Coefficients of skewness for all variables were calculated separately for males and females (see Appendix R-1). For females, only Interpersonal Sensitivity exhibited a statistically significant skewed distribution, at $p < .01$. For males, only Self-Esteem exhibited a statistically significant skewed distribution, at

$p < .01$. Both of these variables were negatively skewed. In general, the pattern (i.e., direction) of skewness for males and females across variables was similar. It should be noted that for some variables the distributions for females tended to be more "moderately" skewed than the distribution for males (see Appendix R-1). The degree of skewness for most variables in both groups, however, was substantially reduced once case outliers were taken into consideration (see below).

Case Outliers. All variables were checked for univariate case outliers. Outliers for males and females were identified separately. Those subjects exhibiting a Z-score, for a particular variable, greater than ± 3.00 were considered outliers. For females, four variables, Interpersonal Sensitivity, Self-Reliant, Empathic Concern and Public Self-Consciousness, exhibited low extreme outliers. While the latter three variables exhibited only one outlying case, Interpersonal Sensitivity produced two case outliers with extreme Z-scores less than -3.00 . For males, Empathic Concern, Self-Esteem and Denial-Avoidance all exhibited extreme outliers. Empathic Concern and Self-Esteem produced only one low extreme outlier each. For Denial-Avoidance, two outliers were detected, one low extreme outlier and one high extreme

outlier.

Instead of dropping outliers (and possibly reducing the generalizability of the results), outlier scores were recoded to one unit larger or smaller than the next most extreme score in the distribution. This method was chosen to preserve the representation of case outliers without allowing the extremely deviant score to distort subsequent correlations (see Tabachnick & Fidell, 1983).

Once female Interpersonal Sensitivity outliers were recoded, the coefficient of skewness associated with this variable was no longer statistically significant, at the .01 level (see Appendix E-1). The recoding of other female case outliers also substantially reduced the degree of skewness associated with these variables (e.g., Self-Reliant, Empathic Concern and to a lesser extent Public Self-Consciousness; see Appendix E-1). Recoding outlier males substantially reduced the degree of skewness associated with Empathic Concern, but did not substantially reduce the degree of skewness associated with Self-Esteem. As indicated in Appendix E-1, Self-Esteem remained highly skewed for both males and females (though not statistically significant at $p < .01$, for females). This finding should be taken into consideration when

interpreting results involving the Self-Esteem variable. In general, however, once outliers were identified and modified, deviations from a normal distribution were within acceptable limits for all variables¹⁷.

Analyses Considerations

Investigation of the interrelationship among the variables in Study 3 focused primarily on correlation magnitudes. Given the relatively large sample sizes, correlations as low as $r=.20$ would emerge as statistically significant. Therefore, it was decided, a priori, that only correlations $r= \pm .30$ ($r^2=.09$) would be interpreted as a meaningful association. This cut-off rule also helped to control the alpha "experiment-wise" error rate by keeping alpha "per comparison" below $p < .002$ for zero-order correlations

Since possible gender differences were of particular interest for Study 3, it was decided a priori, to report results for males and females separately. For the interested reader, correlation magnitudes for all subjects combined may be derived by appropriately weighting zero-order correlations based on the number of females ($n=103$) and males ($n=104$) in this study. As one can see, however, sample sizes for these two

groups were quite close, allowing for quick estimates of the correlation for all subjects by simply averaging unweighted correlations for females and males. In most cases, Fisher's Z-test (see Kleinbaum and Kupper, 1978) was used to test the magnitude of correlation differences for females and males, with alpha set at .05 (two tailed test; $Z_{(critical)} = \pm 1.96$). This approach, however, is conservative and it is recommended that suggested trends be considered when the magnitude of correlation differences for females and males exceed $Z_{(critical)} = \pm 1.65$ (two tailed test, $\alpha = .10$).

Finally, for some variables in this study, it was predicted that the "interaction" or joint relation among certain variables would account for more variance in a criterion variable than a mere additive model. To lessen the possibility of committing a Type II error concerning the joint relation of two variables, Pedhazur (1982) recommended that a more liberal alpha level ($p < .10$) be used when testing product terms (see also, Tabachnick & Fidell, 1983). This recommendation was adopted for tests of product terms in this study. The pattern of statistically significant joint relationships for females and males was also of particular interest, so the results for females and males were analysed separately.

Whether the pattern of results differed statistically, however, was also tested by conducting appropriate analyses which included gender as an "independent" variable and testing the 3-way interaction term (i.e., gender, plus the two variables suggesting a joint relationship).

Three-way interaction terms were tested against the same alpha level set for "two-way" interaction terms (i.e., joint relationships), that is, alpha set at $p < .10$.

BSRI-Revised: Subscales

Reliability. A copy of the items comprising Interpersonal Sensitivity, Self-Reliant and Assertiveness scales are presented in Appendix F. Cronbach alpha reliabilities for these three scales are listed in Table 23. Females and males exhibited uniformly high reliability coefficients for Interpersonal Sensitivity. Reliability coefficients were somewhat lower for the self oriented scales, particularly the Self-Reliant subscale. As one can see from Table 23, however, all reliability coefficients were $> .70$.

Gender Differences. Table 24 contains the means and standard deviations of the three BSRI-Revised scales, computed separately for

Table 23. For Females and Males in Survey Sample: Alpha Reliability Coefficients for BSRI-Revised Scales.

	Females	Males
<u>BSRI-Revised Scales</u>		
Interpersonal Sensitivity	.85	.37
Self-Reliant	.79	.74
Assertiveness	.86	.75

Survey males and females. To test whether females and males differed on the three BSRI-Revised scales, Hotelling's T^2 was computed with the three scales as dependent variables. A statistically significant

difference between females and males emerged ($X^2_{[3]} = 27.64, p < .001$).

Appendix R-2 contains standardized and structure coefficients for this

solution. The overall R^2 indicated that, knowing whether a subject was male or female, accounted for 13% of the variance in the linear combination of BSRI-Revised scale scores. Classification results indicated that 64.7% of the subjects in this sample could be correctly classified. The percentage of females correctly classified (67%) was slightly higher than the percentage of males correctly classified (62.4%). As one can see, a substantial proportion of males and females were incorrectly classified, with only extreme scores successfully discriminating among males and females.

The pattern of structure coefficients (see Appendix R-2) as well as gender difference F-ratios associated with each variable indicated that only Interpersonal Sensitivity and Assertiveness produced statistically significant gender differences (see also Table 24). The pattern of means indicated that females tended to score higher than males on Interpersonal Sensitivity, but lower than males on the Assertiveness Scale. When each variable was considered alone, however, gender failed to account for a particularly meaningful proportion of variance for these variables.

Correlations Among BSRI-Revised scales. Table 25 lists the

Table 24. Females and Males in Survey Sample: Means and Standard Deviations for BSRI-Revised Scales.

Subjects	Interpersonal Sensitivity		Self-Reliant		Assertive	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Females	61.48	7.22	36.88	5.44	42.00	9.04
Males	58.17	8.48	37.37	5.35	46.34	7.60
	$r^2=.04^{**}$		$r^2=.00$		$r^2=.06^{**}$	

* $p < .05$

** $p < .01$

Table 25. Females and Males in Survey Sample: Correlations Among BSRI-Revised Scales.

	Interp. Sens.	Self- Reliant	Assertive
Interp Sens.	—	.36	.25
Self- Reliant	.24	—	.57
Assertive	.17	.60	—

Correlations for females are above the diagonal; correlations for males are below the diagonal.

correlations among BSRI-Revised scales, computed separately for males and females. Although mean differences for some scales were observed for females and males, the pattern of relationship among scales was similar for males and females. As expected, correlation magnitudes for both groups indicated a high degree of convergence between Self-Reliant

and Assertiveness scales. These self oriented scales produced, for the most part, only "trivial" correlations with Interpersonal Sensitivity. Interpersonal Sensitivity and Self-Reliant scales, however, did correlate .36 for females. The difference between correlation magnitudes for females and males for these variables, however, failed to approach statistical significance ($Z=.93$).

BSRI-Revised Scales: Subjects Not Participating in Survey.

Subjects who completed the BSRI scale during the mass testing session, but failed to participate in the Experience Survey session, were available for analysis. For this Comparison Sample, a total of 153 females and 152 males were considered¹⁸. Case outliers on BSRI-Revised scales were identified and recoded in a manner similar to the Survey sample. For Interpersonal Sensitivity, 2 low extreme male case outliers and 1 low extreme female case outlier were identified. Once recoded, Interpersonal Sensitivity remained significantly skewed (negatively; $p < .01$) for Comparison males. No extreme outliers were present for the Assertive scale. One male exhibited a low extreme score for the Self-Reliant scale. Even after this outlier was recoded, the Self-Reliance scale remained negatively skewed at $p < .01$. The

Self-Reliance scale was also negative skewed at $p < .01$ for Comparison females, though no extreme outliers were present (see Appendix R-3).

Table 26 contains the means and standard deviations for the three BSRI-Revised scales, computed separately for males and females. To test for gender differences in the Comparison sample, Hotelling's T^2 was computed with the three BSRI-Revised scales as dependent variables. Although the overall R^2 was statistically significant ($R^2 = .08$), only the univariate F-value associated with Interpersonal Sensitivity was statistically significant (see also Appendix R-4). Like the Survey sample, the mean value for females on Interpersonal Sensitivity was higher than the mean value for males. Males and females in this sample failed to differ on either of the self oriented measures.

Table 27 lists the correlations between BSRI-Revised scales, computed separately for males and females in the Comparison sample. The pattern of results was similar to those found in the Survey sample. For both males and females, Self-Reliant and Assertiveness measures were highly correlated. Furthermore, Interpersonal Sensitivity failed to produce meaningful correlations with either Self-Reliant or

Table 26. Females and Males in Comparison Sample: Means and Standard Deviations for BSRI-Revised Scales.

Subjects	Interpersonal Sensitivity		Self-Reliant		Assertive	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Females	61.59	7.87	38.59	4.93	45.05	9.94
Males	56.69	9.71	38.16	5.61	46.59	10.00
	$r^2=.07^{**}$		$r^2=.00$		$r^2=.01$	

* $p < .05$

** $p < .01$

Table 27. Females and Males in Comparison Sample: Correlations Among BSRI-Revised Scales.

	Interp. Sens.	Self Reliant	Assertive
Interp Sens.	—	.28	-.01
Self Reliant	.20	—	.59
Assertive	.23	.61	—

Correlations for females are above the diagonal; correlations for males are below the diagonal.

Assertiveness scales for both females and males. In particular, the meaningful correlation between Interpersonal Sensitivity and Self-Reliance observed for females in the Survey sample failed to replicate for females in the Comparison sample (i.e., the correlation failed to achieve the $r = \pm 3.0$ cut-off defining a meaningful relationship for this study).

Absorption: Gender Differences. Separate t-tests were performed to compare mean values for females and males in the two samples. For the Survey sample, the mean value for females ($\bar{X}=84.64$; $sd=18.49$) failed to differ statistically from the mean value for males ($\bar{X}=80.69$; $sd=16.94$) on the Absorption scale [$t_{(202)}=1.59$; $p > .05$]. For subjects not participating in the Survey (i.e., Comparison sample), results were similar. For the Absorption scale, the mean value for females ($\bar{X}=82.18$; $sd=17.63$) failed to differ statistically from the mean value for males ($\bar{X}=80.05$; $sd=19.26$; $t_{(303)}=1.00$, $p > .05$).

BSRI -Revised Scales and Absorption

For females and males in the Survey sample, correlations between the total Absorption scale and the three BSRI-Revised scales were

calculated and are reported in Table 28a. Although Interpersonal Sensitivity and Absorption were correlated for males, these two variables failed to meaningfully correlate for females. Although a gender difference trend between these two correlations was observed, the difference failed to achieve statistical significance at $p=.05$, two-tailed test ($Z=1.76$). As predicted, Assertiveness failed to correlate with Absorption for either females or males in the Survey sample. The Self-Reliant scale, however, exhibited an unexpected positive correlation with Absorption for males. These two variables failed to meaningfully correlate for females in the Survey sample. Though a gender difference trend was present, the difference between these two correlation magnitudes failed to achieve statistical significance at $p=.05$, two tailed test ($Z=1.73$).

. For subjects in the Comparison sample, correlations for the Absorption scale with BSRI-Revised scales were computed. Table 28b lists these correlations for the Comparison sample, computed separately for males and females. As one can see, the pattern of correlations from the Survey sample to Comparison sample were similar. The correlation between Absorption and Self-Reliant scales observed for

Table 28a. Females and Males in Survey Sample: Correlations Between Absorption and BSRI-Revised Scales.

	Interpersonal Sensitivity	Self- Reliant	Assertive
with Absorption			
Survey Females	.16	.13	.12
Survey Males	.39	.36	.11

Table 28b. Females and Males in Comparison Sample: Correlations Between Absorption and BSRI-Revised Scales.

	Interpersonal Sensitivity	Self- Reliant	Assertive
with Absorption			
Comparison Females	.20	.21	.13
Comparison Males	.41	.15	.15

Survey males, however, failed to replicate for Comparison males. For Interpersonal Sensitivity and Absorption, however, the difference between correlation magnitudes for males and females in the Comparison sample did achieve statistical significance ($Z=2.01$). This statistically significant difference for this sample and the trend in the same direction for the Survey sample suggested an unexpected gender difference for the association between the Absorption scale and Interpersonal Sensitivity scale.

Interpersonal Orientation: Testing Hirschman's Hypothesis

A number of analyses were conducted to investigate the joint relationship of self and other oriented measures to the Absorption scale. Since it was unclear (from the pattern of correlations with Absorption) which of the self oriented measures would be more appropriate, exploratory analyses were conducted for each self oriented variable separately. The approach adopted by Hirschman of dichotomizing her continuous variables, however, was rejected for these analyses. Pedhazur (1983) outlined a variety of reasons for not categorizing continuous variables, including loss of valuable information (i.e.,

predictable variability; see also Cohen & Cohen, 1975) and difficulties generalizing from one study to another (since median splits may vary from one study to another). Pedhazur also severely criticized categorizing attribute (i.e., non-experimental) variables because of the illusion it creates that the researcher has experimental control over the categorized continuous variable. Therefore, for all analyses, the other and self oriented scales in this study were left "continuous".

A test of the joint relationship of self and other oriented measures to the criterion (Absorption) is equivalent to a test of the product term for these two variables. To test whether product terms accounted for a meaningful proportion of unique variance in Absorption scores, variance associated with an additive model was controlled first. That is, Interpersonal Sensitivity and the self oriented measure of interest for a particular analysis were entered first into the equation. Therefore, product terms were always entered last into the regression equation. Results for the interactive models proposed were of primary interest and will be reviewed in detail. While results for appropriate additive models have been generated, discussion of these results were limited to general observations.

Self-Reliant as Self-Oriented Measure. For females and males in the Survey sample, results for Self-Reliant as the self-oriented measure are presented in Appendix R-5. Results for both additive and interactive models are presented. Results indicated that the joint relationship between Interpersonal Sensitivity and Self-Reliant scores for both female and male Survey samples failed to account for a statistically significant proportion of variance in Absorption scores over and above that accounted for by the interpersonal orientation variables alone (i.e., additive model). The proportion of variance of Absorption scores accounted for by the overall additive models (i.e., Interpersonal Sensitivity and Self-Reliance) for females ($R^2_{(add)}=.03$, ns) and males ($R^2_{(add)}=.23$, $p < .05$), however, did differ statistically. Fisher's Z-test, modified to reflect the estimate of an additional variable in the analysis, achieved statistical significance ($Z=2.46$, $p < .05$).

The pattern of results for these variables in the Comparison sample, however, differed from the Survey sample. For females and males in the Comparison sample, results for Self-Reliance as the self-oriented measure are presented in Appendix R-6. For females in the Comparison sample, the Self-Reliant X Interpersonal Sensitivity interaction term

accounted for a statistically significant proportion of unique variance in Absorption scores. For these female subjects, the overall R^2 value associated with the interactive model was $R^2_{(inter)}=.13$, $p < .05$. For males in the Comparison sample, however, the Self-Reliant X Interpersonal Sensitivity interaction term with Absorption as the criterion failed to even approach statistical significance. This apparent gender difference was supported by a statistically significant Gender X Interpersonal Sensitivity X Self-Reliance interaction with Absorption as the criterion [$t_{(298)}=1.78$, $p < .01$].

To examine the joint relationship of Self-Reliance and Interpersonal Sensitivity with Absorption observed for Comparison sample females, two separate regression lines from the family of lines associated with the interactive model (see Cohen & Cohen, 1975) were calculated. Self-Reliance was selected as the "moderating" variable. A representative value for Low Self-Reliance scores was selected by taking the 25th percentile value for Criterion females on this variable. A representative value for High Self-Reliance was selected by taking the 75th percentile value for Criterion females on this variable. The following representative regression lines were calculated:

$$\text{Low Self-Reliance (36)} \quad y'(\text{ABS}) = -.104(\text{IS}) + 85.45$$

$$\text{High Self-Reliance (42)} \quad y'(\text{ABS}) = .573(\text{IS}) + 48.58$$

These two lines have been plotted in Figure 3. Solving for the two unknowns in these equations (i.e., $y'(\text{ABS})$; $\text{IS} = \text{Interpersonal Sensitivity}$) allowed the point of intersection of these two equations to be determined, as indicated in Figure 3. Vertical hatched lines included in this figure represent Interpersonal Sensitivity values one and two standard deviations from the Interpersonal Sensitivity mean for Comparison females. These vertical lines help to evaluate whether the intersection of these two lines occurs within the range of Interpersonal Sensitivity values of interest. In general, these results suggested that, for lower Self-Reliant values, Interpersonal Sensitivity and Absorption exhibited little or no relationship. For higher Self-Reliant values, however, Interpersonal Sensitivity and Absorption exhibited a positive relationship. As suggested in Figure 3, the joint relationship of Interpersonal Sensitivity and Self-Reliance with Absorption clearly suggested a disordinal "interaction". The two regression lines cross well within the range of Interpersonal Sensitivity scores of interest.

Figure 3. For Females in the Comparison Sample: Visual Representation of the Joint Relationship of Interpersonal Sensitivity and Self-Reliance with Absorption as the Criterion Variable.

Figure 3. Comparison Sample Females Only

For Interpersonal Sensitivity values below the point of intersection, Self-Reliant scores were associated with higher predicted values on Absorption than higher Self-Reliant scores. This pattern, however, was only observed for extreme low values on Interpersonal Sensitivity (i.e., lower than one standard deviation from the Interpersonal Sensitivity mean value). For Interpersonal Sensitivity values above the point of intersection, higher Self-Reliant scores were clearly associated with higher predicted values on Absorption. This pattern was observed for a much broader range of Interpersonal Sensitivity values.

Assertiveness as the Self-Oriented Measure. For females and males in the Survey sample, results for Assertiveness as the self-oriented measure are presented in Appendix R-7. Results indicated that, for males in the Survey sample, the joint relationship between Interpersonal Sensitivity and Assertiveness scores for Survey males failed to account for a statistically significant proportion of variance in Absorption scores over and above that accounted for by these interpersonal orientation variables alone (i.e., additive model). For Survey males, the overall additive model was statistically significant and accounted for 16% of the variance in Absorption scores. Only

Interpersonal Sensitivity, however, accounted for unique variance in Absorption scores for Survey males.

For Survey females, the Interpersonal Sensitivity X Assertiveness interaction term approached statistical significance ($p=.11$; see Appendix R-7), but the overall interactive model was not statistically significant ($R^2_{(inter)}=.06$, $p > .05$). The additive model for Survey females also failed to achieve statistical significance ($R^2_{(add)}=.03$, $p > .05$). Although the additive model for Survey males did achieve statistical significance, this model's overall R^2 values for Survey males failed to differ from this model's overall R^2 value for Survey females (Modified Fisher $Z=1.61$).

For females and males in the Comparison sample, results for Assertiveness as the self-oriented measure are presented in Appendix R-8. Results for males in the Comparison sample were highly similar to results for males in the Survey sample. For Comparison males the joint relationship between Interpersonal Sensitivity and Assertiveness scores failed to account for a statistically significant proportion of variance in Absorption scores over and above that accounted for by these interpersonal orientation variables alone (i.e., additive model). The

overall additive model was statistically significant and accounted for 17% of the variance in Absorption scores. Like Survey males, only Interpersonal Sensitivity accounted for a statistically significant proportion of unique variance in Absorption scores for Comparison males. For females in the Comparison sample, however, the Interpersonal Sensitivity and Assertiveness product term was statistically significant for Comparison females ($p < .05$) and the overall $R^2_{(inter)} = .09$ for the interactive model was also statistically significant at $p < .05$. The apparent gender difference for Comparison sample results, however, was not supported by results testing the Gender X Interpersonal Sensitivity X Assertiveness interaction. With Absorption scores as the criterion variable, this 3-way interaction failed to achieve statistical significance [$t_{(298)} = .85$, $p > .10$]. Given these results, the data for females and males were combined. Results for additive and interactive models for Interpersonal Sensitivity and Assertiveness with Absorption as the criterion, all subjects combined, are presented in Appendix R-8. For all subjects in the Comparison sample, the Interpersonal Sensitivity and Assertiveness product term was statistically significant ($p < .05$).

The overall $R^2_{(inter)}=.12$ for the interactive model was also statistically significant.

To examine the joint relationship of Interpersonal Sensitivity and Assertiveness with Absorption, two separate regression lines associated with the interactive model were calculated. Assertiveness was selected as the "moderating" variable. Low and High Assertiveness values were defined by 25th and 75th percentile values, respectively for the total Comparison sample. The following representative regression lines were calculated:

$$\text{Low Assertiveness (40)} \quad y'_{(ABS)} = .5003(IS) + 50.25$$

$$\text{High Assertiveness (52)} \quad y'_{(ABS)} = .7199(IS) + 39.59$$

These two lines have been plotted in Figure 4a. Overall, results suggested that, for the Comparison sample, Interpersonal Sensitivity and Absorption were positively related, but that the strength of this relationship was stronger when subjects were higher on Assertiveness. Only for more extreme levels of Interpersonal Sensitivity, however, did this pattern suggest a potentially meaningful difference. Figure 4b plots the joint relationship of Assertiveness and Interpersonal Sensitivity

Figures 4a and 4b. Visual Representation of the Joint Relationship of Interpersonal Sensitivity and Assertiveness with Absorption, for All Subjects in the Comparison Sample (Figure 4a) and Comparison Sample Females Only (Figure 4b).

Figure 4a. All Subjects in Comparison Sample

Figure 4b. Females Only in Comparison Sample

with Absorption for Comparison females only. Representative regression lines depicted in this figure are:

$$\text{Low Assertiveness (40)} \quad y'(\text{ABS}) = .1722(\text{IS}) + 70.47$$

$$\text{High Assertiveness (52)} \quad y'(\text{ABS}) = .6390(\text{IS}) + 44.41$$

The strength of the interaction for females does appear stronger, though as stated previously, the 3-way interaction testing for gender differences failed to approach statistical significance. Recall, however, that when Self-Reliance served as the self-oriented measure, the pattern of results for Comparison females (i.e., interaction) differed significantly from Comparison males (i.e., interaction, ns). Figure 4b for Comparison females alone, "more easily" resembles the pattern suggested when Self-Reliance served as the self-oriented measure (see Figure 3).

Comparison of Figure 3 and Figure 4b suggested that, for Comparison females, the pattern of results (i.e., "performance") of the two self-oriented measures was somewhat similar. Interpersonal Sensitivity scores appeared associated with little change in predicted Absorption scores when scores on the self-oriented scale were lower. When a higher self-oriented score was selected, Interpersonal

Sensitivity appeared positively associated with Absorption. One should keep in mind, however, that while these results suggested a meaningful joint relationship for self and other oriented measure with Absorption, the results were not dramatic. For Comparison females, the Interpersonal Sensitivity X Self-Reliance interactive model accounted for 13% of the variance in Absorption. The Assertiveness X Interpersonal Sensitivity interactive model for Comparison females accounted for a marginal 9% of the variance in Absorption.

Empathy and Related Variables

The variables considered in this section included the four subscales associated with Davis' Interpersonal Reactivity Index and the Denial-Avoidance scale (from Stotland, et al., 1978). The correlations among these variables, computed separately for Survey females and males, are presented in Table 29. For IRI subscales, the results reported here generally replicated those reported by Davis for these scales. In Davis' study, Empathic Concern correlated with Perspective Taking and Fantasy scales. No other subscales in Davis' study meaningfully correlated (i.e., all other correlations < .30). In the present study,

Empathic Concern and Perspective Taking were also meaningfully correlated for both males and females. As one can see from Table 29, the strength of the relationship between these two variables appeared stronger for females than for males, though the difference failed to achieve statistical significance ($Z=1.36$). Unlike Davis' study, however, Empathic Concern and Davis' Fantasy scale failed to meaningfully correlate in this study.

As expected, Empathic Concern and the Denial-Avoidance scale exhibited a strong negative correlation for both male and female samples, particularly males. The difference between correlations for males and females was statistically significant ($Z=2.00$).

Denial-Avoidance also exhibited a small, though meaningful negative association (i.e., $r > .30$) with Davis' Fantasy scale for both males and females. Denial-Avoidance also exhibited a marginal negative relationship with Perspective Taking for males, and with Personal Distress for females. Comparison of correlation magnitudes for females and males, however, failed to produce statistically significant differences in either case.

Table 29. Correlations Among Empathy Related Variables for Survey Females and Males.

	Empathic Concern	Perspective Taking	Fantasy	Personal Distress	Denial
Empathic Concern	-.-	.49	.20	.20	-.40
Perspective Taking	.33	-.-	-.23	-.05	-.13
Fantasy	.25	.22	-.-	.25	-.36
Personal Distress	.22	-.16	.04	-.-	-.36
Denial	-.61	-.30	-.32	-.13	-.-

Females above the diagonal; Males below the diagonal.

In order to determine whether mean values for males and females differed for "empathy related" variables, a Hotelling's T^2 was performed with the 5 variables included in Table 29. Standardized and Structure coefficients for this analysis are presented in Appendix R-9. This Hotelling's T^2 was statistically significant [$X^2_{(5)} = 44.68, p < .001$], with an overall $R^2 = .20$, indicating that group membership accounted for 20% of the variance in the linear combination of empathy related variables. The linear combination of these variables correctly classified approximately 71% of the males and 72% of the females.

The means, standard deviations and the proportion of variance accounted for by group membership (i.e., Gender) for each empathy related variable alone are presented in Table 30. Statistically significant differences between females and males emerged for 4 out of the 5 variables listed; only Perspective-Taking failed to show a statistically significant gender difference. Females exhibited higher mean values than males on all statistically significant variables except Denial-Avoidance. Males exhibited higher Denial-Avoidance scores than

Table 30. Comparison of Survey Females and Males on Empathy Related Variables: Means, Standard Deviations and Proportion of Variance Accounted for by Gender for Each Variable Alone.

Dependent Variables	Females		Males		r^2 - value
	$\bar{X}$	sd	$\bar{X}$	sd	
Empathy	21.21	3.39	18.78	3.83	.10**
Perspective-Taking	17.09	4.66	16.84	4.69	.00
Fantasy	18.33	5.77	15.94	5.53	.04**
Personal Distress	12.38	4.69	9.86	4.30	.07**
Denial ^a	21.84	3.93	25.44	4.72	.15**

^an=102 females.

*p < .05

**p < .01

females (i.e., "unwillingness to empathize").

The BSRI, Absorption and Empathy Related Variables

Empathic Concern. Correlations for Davis' Empathic Concern scale with BSRI-Revised scales and the Absorption scale are presented in Table 31. Both Self-Reliant and Assertiveness scales failed to correlate with Empathic Concern. As expected, however, Interpersonal Sensitivity exhibited a moderate relationship with Empathic Concern for both males and females.

The Absorption scale, however, failed to meaningfully correlate (i.e., $r > .30$) with Empathic Concern for either males or females. As shown in Table 29, Davis' Fantasy scale produced comparatively low correlations with Empathic Concern also. If one considers the Absorption subscales generated in Study 1, only Reality (Nature) Absorption produced correlations greater than $r = .30$ with Empathic Concern (see Appendix R-10). Correlations between this Absorption subscale and Empathic Concern, however, were not particularly impressive. Reality (Nature) Absorption and Empathic Concern correlated $r = .34$ for females and $r = .30$ for males. Though higher, these

Table 31. Empathic Concern: Correlations with BSRI-Revised Scales and with Absorption for Survey Females and Males.

with Empathic Concern	Interpersonal Sensitivity	Self- Reliant	Assertive	Absorption
Females	.45	.24	.10	.21
Males	.48	.00	-.10	.24

correlations were not substantially different than correlation magnitudes for Empathic Concern and the overall Absorption scale.

Considering only the magnitude of zero order correlations between Empathic Concern and Absorption (and Fantasy Involvement) measures would suggest that these two variables were not meaningfully related. However, the relationship between Absorption and Empathic Concern may vary as a function of one's level on some other variable, such as the degree to which an individual's perceives themselves as other directed.

To investigate whether the joint relationship of Interpersonal Sensitivity and Absorption accounted for more variance in Empathic Concern scores than an additive model for these two variables, product terms for Interpersonal Sensitivity and Absorption scores were calculated for males and females. Results for the additive and interactive models are presented in Table 32. Test of the product term for females was highly significant, with the joint relationship between Interpersonal Sensitivity and Absorption (i.e., product term) accounting for 6% of unique variance in Empathic Concern scores. Although results for males showed a trend in the same direction as females, the product term for males failed to achieve statistical significance with alpha set at $p = .10$. Consistent with the suggested similarity in the pattern of results for females and males, the Gender X Interpersonal Sensitivity X Absorption interaction term with Empathic Concern as the dependent variable failed to achieve statistical significant [$t_{(196)} = -1.07, p=.29$].

Since the pattern of results for females and males was similar, these data were combined. Regression results for the additive and interactive model for all subjects combined is also presented in Table 32. The product term for Interpersonal Sensitivity and Absorption was

Table 32. Test of the Joint Relationship between Absorption and Interpersonal Sensitivity, with Empathic Concern as the Criterion Variable: Survey Females, Males and All Subjects Combined.

Criterion Variable: Empathic Concern

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
<u>Females</u>								
Interpersonal Sensitivity	.425	4.76	.00	.17	1.596	3.57	.00	
Absorption	.148	1.66	.10	.02	2.383	2.83	.01	
I X A					-2.699	-2.67	.01	.06
Overall				$R^2 = .22^{**}$				$R^2 = .28^{**}$

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
<u>Males</u>								
Interpersonal Sensitivity	.456	4.74	.000	.18	.971	2.54	.02	
Absorption	.063	.65	.50	.00	.842	1.49	.14	
I X A					-1.10	-1.39	.17	.02
Overall				$R^2 = .23$				$R^2 = .25$

All *t*-values are statistically significant at reported *p*-values.

* $p < .05$

** $p < .01$

Table 32 (Continued).

Criterion Variable: Empathic Concern

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
<u>All Subjects</u>								
Interpersonal Sensitivity	.465	7.33	.00	.20	1.171	4.38	.00	
Absorption	.114	1.79	.07	.01	1.313	2.94	.00	
I X A					-1.569	-2.71	.01	.03
<i>Overall</i>				$R^2=.26^{**}$				$R^2=.29^{**}$

All *t*-values are statistically significant at reported *p*-values.

* *p* .05

** *p* < .01

highly significant [$t_{(200)}=2.72$, *p* < .01] and the interactive model accounted for approximately 29% of the variance in Empathic Concern scores.

To examine the joint relationship of Interpersonal Sensitivity and Absorption to Empathic Concern, two representative regression lines

associated with the interactive model were calculated. Interpersonal Sensitivity was selected as the "moderating" variable. Low and High Interpersonal Sensitivity values were defined by 25th and 75th percentile values, respectively for all Survey subjects. The following representative regression lines were calculated:

$$\text{Low Interpersonal Sensitivity (55)} \quad y' (\text{Empathy}) = .0491(A) + 15.15$$

$$\text{High Interpersonal Sensitivity (65)} \quad y' (\text{Empathy}) = .0067(A) + 20.73$$

These two lines have been plotted in Figure 5. Interpretation of these results suggested that, for subjects high on Interpersonal Sensitivity, there is very little regression of Empathic Concern on Absorption. That is, high Interpersonal Sensitivity subjects tend to exhibit high Empathic Concern scores, regardless of their score on Absorption. As Interpersonal Sensitivity scores decrease, however, the slope of Empathic Concern on Absorption increases slightly. That is, for subjects lower on Interpersonal Sensitivity, Absorption contributes to a slight increase in Empathic Concern scores. Contrary to predictions, Absorption failed to "intensify" the relationship between Interpersonal Sensitivity and Empathic Concern. Note in Figure 5, however, that the point of intersection for the two representative regression lines is well

Figure 5. For All Survey Subjects: Visual Representation of the Joint Relationship of Interpersonal Sensitivity (i.e., Other Orientation) and Absorption with Empathic Concern as the Criterion Variable.

Figure 5. All Subjects in Survey Sample

beyond the range of Absorption values of interest (maximum possible Absorption score equals 136). Absorption, however, did contribute to increased predicted Empathic Concern scores for subjects lower on Interpersonal Sensitivity. Though Absorption appeared to enhance predicted Empathic Concern scores for lower Interpersonal Sensitivity subjects, this increase was slight and failed to predict Empathic Concern scores of the magnitude predicted for higher Interpersonal Sensitivity subjects.

Perspective Taking. Correlations for the Perspective Taking scale with BSRI-Revised scales and the Absorption scale are presented in Table 33. The pattern of results suggested in Table 33 are similar in some respects to the pattern of results found for the Empathic Concern scale (see Table 31). Like Empathic Concern, Perspective Taking positively correlated with Interpersonal Sensitivity in both male and female samples (correlation differences were not statistically significant; $Z = 1.20$). In addition, Perspective Taking scores failed to correlate with Assertiveness scores in both male and female samples. Finally, Perspective Taking failed to correlate with Self-Reliance for females and produced only a small positive correlation ($r = .30$) for

Table 33. Perspective-Taking: Correlations with BSRI-Revised Scales and with Absorption for Survey Females and Males.

with Perspective Taking	Interpersonal Sensitivity	Self- Reliant	Assertive	Absorption
Females	.34	.18	-.04	.23
Males	.47	.30	.15	.22

Survey males (correlation differences were not statistically significant; $Z = .90$).

Perspective Taking and Absorption scores produced only low correlations ($r < .30$) for both Survey females and males. Correlation magnitudes, however, were comparable to correlations magnitudes for Empathic Concern and Absorption in this study (see Table 31). This finding was unexpected. Given previous research results (e.g., Davis, 1983), it was expected that imaginative involvement measures would

show a stronger relationship with Empathic Concern than with Perspective Taking. Davis' Fantasy scale (see Table 29) and the Absorption scale (see Tables 31 and 33) produced correlations of similar magnitude with Empathic Concern and Perspective Taking. Correlations between these two variables and imaginative involvement variables were all $< .30$. Perspective Taking scores showed a similar pattern of correlations with Interpersonal Sensitivity and Absorption as Empathic Concern. Therefore, exploratory regression analyses, similar to those reported for Empathic Concern, were conducted with Perspective Taking scores as the criterion.

Unlike Empathic Concern, the joint relationship of Interpersonal Sensitivity and Absorption failed to account for a meaningful proportion of unique variance in Perspective Taking scores. This finding held for both female and male samples, as well as all subjects combined (see Appendix R-11).

Finally, it was suggested in the introduction to Study 3 that persons high on Perspective-Taking may weight all perspectives in an interpersonal situation (including their own), suggesting that the joint relationship of Interpersonal Sensitivity and Self-Reliance to

Perspective Taking may account for more variance in Perspective Taking than a mere additive model. Results for additive and interactive models for predictors, Interpersonal Sensitivity and Self-Reliance with Perspective Taking as the Criterion are presented in Appendix R-12. The additive model for females ($R^2_{(add)}=.12, p < .05$) and the additive model for males ($R^2_{(add)}=.26, p < .01$) were both statistically significant (the magnitude difference of these two R^2 failed to achieve statistical significance; modified Fisher $Z=1.40, p>.10$). For both females and males, however, the joint relationship of Interpersonal Sensitivity and Self-Reliance failed to account for a statistically significant proportion of unique variance in Perspective Taking scores. This finding also held when all subjects were combined (see also Appendix R-12).

Denial-Avoidance. Correlations for Stotland's Denial-Avoidance scale with BSRI-Revised scales and the Absorption scale are presented in Table 34. As predicted Denial-Avoidance exhibited a strong negative relationship with Interpersonal Sensitivity for males. These two scales, however, failed to correlate above the set criterion (i.e., $r > .30$) for females in this study, though the magnitude of the correlation for

Table 34. Denial-Avoidance: Correlations with BSRI-Revised Scales and with Absorption for Survey Females and Males.

with Denial-Avoidance	Interpersonal Sensitivity	Self- Reliant	Assertive	Absorption
Females ^a	-.24	-.06	.04	-.21
Males	-.42	-.02	.08	-.43

^a_n=102

females failed to differ significantly from the magnitude of the correlation for males ($Z = 1.43$). While this suggested trend was unexpected, the lower correlation for females may have resulted because of limited variability on the Denial-Avoidance scale among female subjects. As indicated in Table 30, females exhibited a statistically significant lower mean value on the Denial-Avoidance scale than males and somewhat less variability (Bartlett's Box F Homogeneity of Variance test was marginal, $F=3.30$, $p = .069$).

The Denial-Avoidance scale also exhibited a moderately strong

negative correlation with the Absorption scale for males in the study.

These two variables, however, failed to meaningfully correlate in the female sample (the difference between correlation magnitudes for males and females, however, failed to achieved statistical significance; $Z = 1.73$). Correlations between Denial-Avoidance and all Absorption subscales were comparable to the correlation magnitude produced by the overall Absorption scale in both female and male samples (see Appendix R-10). Finally, as predicted, the Denial-Avoidance scale failed to correlate with either the Self-Reliant or Assertiveness scales. This finding held for both female and male samples.

Personal Distress. Correlations for the Personal Distress scale with BSRI-Revised scales and the Absorption scale are presented in Table 35. Consistent with Davis' findings, the Interpersonal Sensitivity scale in this study failed to correlate with the Personal Distress scale. This finding held for both females and males. The Personal Distress scale did produce moderate negative correlations with both self-oriented scales. Again correlation magnitudes were similar for female and male groups. Finally, for both males and females, Personal Distress failed to correlate with the Absorption scale. As indicted in Table 29, Davis'

Table 35. Personal Distress: Correlations with BSRI-Revised Scales and with Absorption for Survey Females and Males.

with Personal Distress	Interpersonal Sensitivity	Self- Reliant	Assertive	Absorption
Females	-.12	-.40	-.31	.12
Males	.09	-.32	-.34	.08

Fantasy scale also failed to meaningfully correlate with the Personal Distress scale.

Davis' Fantasy Scale. Finally, for completeness, correlations for Davis' Fantasy scale with BSRI-Revised scales and the Absorption scale are presented in Table 36. As expected, the Fantasy scale and the Absorption scale did exhibit a moderately strong association, with correlations above $r > .40$ for both females and males. Absorption subscales, however, showed some variability in the strength of their

Table 36. Fantasy : Correlations with BSRI-Revised Scales and with Absorption for Survey Females and Males.

with Fantasy	Interpersonal Sensitivity	Self- Reliant	Assertive	Absorption
Females	.06	-.03	-.05	.47
Males	.21	.19	.07	.43

relationship to the Fantasy scale (see Appendix R-10). For females, Reality (Nature) Absorption produced a strong correlation with the Fantasy scale ($r=.51$). All other Absorption subscales for females produced only marginal correlations with the Fantasy scale. For males, it was the Introspective Absorption subscale that exhibited the strongest relationship with the Fantasy scale ($r = .45$). All other subscales, however, produced correlations that were less than .30 with the Fantasy scale for Survey males. Review of these results,

stronger relationship with the Fantasy scale than the overall Absorption scale.

Self-Esteem

Zero-order correlations among self-esteem scores and interpersonal orientation variables (computed separately for females and males) are presented in Table 37. As indicated, Interpersonal Sensitivity failed to meaningfully correlate with Self-Esteem for either males or females.

Both self-oriented measures exhibited moderate correlations with self-esteem, but only for males. For females, self-oriented scores exhibited only marginal correlations with self-esteem scores.

Differences between correlation magnitudes for females and males, however, failed to even approach statistical significance in either case (gender difference comparison, $z < 1$ for both self-oriented scales).

To investigate the joint relationship of self and other oriented measures to self-esteem, regression analyses introducing the product term of the measures were conducted separately for males and females. For these analyses Interpersonal Sensitivity and Self-Reliant scales were introduced into the equation, followed by the product term of these

Table 37. Self-Esteem: Correlations with BSRI-Revised Scales for Survey Females and Males.

with Self-Esteem	Interpersonal Sensitivity	Self- Reliant	Assertive
Females	.26	.29	.29
Males	-.06	.40	.38

scores. Results are presented in Appendix R-13 and indicated that the joint relationship between these variables was statistically significant for males at $p=.10$, but was not statistically significant for females at this alpha level. There was, however, an "interactive" trend for females and the pattern of the joint relationship of Interpersonal Sensitivity and Self-Reliance with Self-Esteem appeared different across females and males. Consistent with this observation, a regression model including gender as an "independent" variable produced a statistically significant

Gender X Self-Reliant X Interpersonal Sensitivity interaction

$t_{(196)} = -2.29, p = .02$. Given these results, it was decided to review the results for males and females separately.

For males, the pattern of joint relationship of Self-Reliance (SR) and Interpersonal Sensitivity (IS) to Self-Esteem may be seen through calculation of representative members of the family of regression lines associated with the interactive model. Interpersonal Sensitivity was selected as the "moderating" variable. Low and High Interpersonal Sensitivity values were defined by 25th and 75th percentile values, respectively for the Survey male sample. The following representative regression lines were calculated:

$$\text{Low Interpersonal Sensitivity (53)} \quad y'_{(SE)} = .5614(SR) + 39.5$$

$$\text{High Interpersonal Sensitivity (63)} \quad y'_{(SE)} = .8858(SR) + 26.01$$

These two lines have been plotted in Figure 6a. As one can see Self-Reliance exhibits a positive relationship with Self-Esteem, regardless of scores on Interpersonal Sensitivity. The point of intersection of the two representative regression lines, however, is well within the range of Self-Reliant scores of interest. Figure 6a suggests

Figures 6a and 6b. Visual Representation of the Joint Relationship of Interpersonal Sensitivity (Other Orientation) and Self-Reliance (Self Orientation) with Self-Esteem, for Survey Males (Figure 6a) and Survey Females (Figure 6b).

Figure 6a. Survey Males

Figure 6b. Survey Females

that, for Low Self-Reliant scores, higher Self-Esteem values are predicted for Survey males who are also lower on Interpersonal Sensitivity, than for Survey males who are higher on Interpersonal Sensitivity (and lower on Self-Reliance). As Self-Reliant scores increase, however, this difference in predicted Self-Esteem scores lessens. For higher Self-Reliant scores (i.e., above the point of intersection) this suggested pattern exhibits a reversal, with higher Interpersonal Sensitivity scores contributing to slightly higher predicted Self-Esteem scores than lower Interpersonal Sensitivity for Survey males. As one can see, however, predicted Self-Esteem scores are very close above the point of intersection, suggesting that the interaction observed for Survey males may be meaningful only when Self-Reliance is low. It would appear that lower Self-Reliance scores, accompanied by higher Interpersonal Sensitivity, may serve to "suppress" predicted Self-Esteem scores for Survey males.

Although the joint relationship between Self-Reliance and Interpersonal Sensitivity with Self-Esteem was not statistically significant at $p=.10$ for Survey females, there was a trend toward an "interaction". The pattern of beta weights also suggested a possible

interaction different from Survey males, which was supported by the statistically significant Gender X Interpersonal Sensitivity X Self-Reliance interaction for Self-Esteem. To compare the interactive trend for Survey females to Survey males, two representative interaction regression lines for the Survey female sample were calculated. With Interpersonal Sensitivity as the moderating variable, High and Low values were defined by 25th and 75th percentile values, respectively for the Survey female sample. The following representative regression lines were calculated:

$$\text{Low Interpersonal Sensitivity (58)} \quad y'_{(SE)} = .4746(SR) + 40.77$$

$$\text{High Interpersonal Sensitivity (66)} \quad y'_{(SE)} = .2668(SR) + 49.93$$

These two regression lines have been plotted in Figure 6b. Clearly the strength of the relationship between Self-Reliance and predicted SE scores is not as strong for Survey females as for Survey males (recall, however, that zero order correlation differences between these two variables for females and males failed to differ significantly). More importantly, however, the pattern of results for Survey females with lower Self-Reliant scores is different than the pattern of results suggested for males with lower Self-Reliant scores. As one can see in

Figure 6b, higher Self-Esteem scores are predicted when lower Self-Reliance is accompanied by higher Interpersonal Sensitivity, compared to lower Self-Reliance and lower Interpersonal Sensitivity. Specifically, when Self-Reliance is lower, higher Interpersonal Sensitivity may contribute to higher predicted Self-Esteem, a pattern that is opposite to Survey males. The pattern of results for Survey females, however, is merely suggestive. Since the Interpersonal Sensitivity X Self-Reliant interaction failed to achieve pre-set levels of statistical significance, the varying slopes for these two regression lines may be attributed to chance fluctuation.

Self-Consciousness Scales

The main reason for including these scales in Study 3 was to investigate the relationship of Private Self-Consciousness to the Absorption scale and Davis' Fantasy scale. Correlations for Private Self-Consciousness with these involvement scales are presented in Table 38. As one can see, Absorption meaningfully correlated with Private Self-Consciousness for males and females, but particularly for males (the difference between correlations for males and females also

Table 38. Private Self-Consciousness: Correlations with Absorption and with Davis' Fantasy Scale for Survey Females and Males.

with Private Self-Consciousness	Absorption	Davis' Fantasy Scale
Females ^a	.37	.30
Males	.58	.38

^a_{n=102}

approached, but failed to achieve statistical significance; $Z = 1.93$).

While correlations between Davis' Fantasy scale and Private Self-Consciousness reached the criterion $r=.30$ for both females and males, correlation magnitudes were not as high as those associated with the Absorption scale¹⁹.

Zero-order correlations for Self-Consciousness scales with Davis' IRI scales are presented in Appendix R-14. Results replicated those

found in Davis' (1983) study. Specifically, Public Self-Consciousness and Perspective Taking failed to meaningfully correlate in either female or male samples. The only statistically significant correlations, other than those associated with Fantasy and Private Self-Consciousness, were between Personal Distress and Anxiety. These two variables exhibited a particularly strong correlation for males ($r=.55$) and a marginal correlation for females ($r=.35$). Again, the difference between these two correlations showed a difference trend, but failed to achieve statistical significance ($Z = 1.78$).

Self-Actualization

Correlations for Self-Actualization scores with BSRI-Revised scales are presented in Table 39. Self-Reliant scores exhibited moderate correlations with Self-Actualization in both female and male samples. Interpersonal Sensitivity also correlated with Self-Actualization, but correlation magnitudes were only marginal for both samples, particularly males. Finally, as predicted, Assertiveness failed to perform as well as Self-Reliance when correlated with Self-Actualization. Assertiveness produced only a marginal correlation

Table 39. Self-Actualization: Correlations with BSRI-Revised Scales for Survey Females and Males.

with Self-Actualization	Interpersonal Sensitivity	Self- Reliant	Assertive
Females	.37	.40	.15
Males	.30	.45	.30

with Self-Actualization for males and failed to meaningfully correlate with Self-Actualization for females.

Regression analyses testing the joint relationship of Interpersonal Sensitivity and Self-Reliance to Self-Actualization are presented in Appendix R-15. Results indicated that the additive model involving Interpersonal Sensitivity and Self-Reliance as predictors sufficiently described the relationship of these variables to Self-Actualization. The interaction term of these variables failed to achieve statistical significance. This pattern of results held for both males and females and all subjects combined.

Discussion - Study 3

A number of primary concerns for this correlational study included the interrelationship of Absorption and Interpersonal Orientation as well as the relationship of these variables to Empathic Concern. The issue of gender differences was also a primary concern, and guided the approach selected for reviewing and analyzing results. The number of secondary variables included in Study 3, however, were numerous. No doubt there are additional "analysis paths" that might be of interest to some readers.

4

PM-1 3½"x4" PHOTOGRAPHIC MICROCOPY TARGET
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Attempts to remain at least somewhat sensitive to the issue of "experiment-wise" error rate, particularly for a study of this nature (i.e., correlational), was an important consideration. Consequently, this study attempted to maintain a planned comparison approach for the analyses conducted.

Absorption and Interpersonal Orientation

One of the primary interests of Study 3 was the relationship of involvement measures, particularly the Absorption scale, to measures of interpersonal orientation. A number of researchers predicted and demonstrated a reliable, though marginal relationship between other oriented measures and various measures of imaginative involvement (e.g., Davis, 1983; Lubinski, et al., 1983). It was expected that the Absorption scale and the Interpersonal Sensitivity scale would replicate these previous results. In this study the Absorption scale exhibited a meaningful relationship with Interpersonal Sensitivity in two separate samples of male subjects. These two variables, however, failed to meaningfully correlate for either sample of female subjects. This pattern of results, however, held only when the Absorption scale was

used as the measure of "imaginative" involvement. Davis' Fantasy scale failed to meaningfully correlate with Interpersonal Sensitivity for either Survey male or Survey female samples (the magnitude of correlations for females and males were also comparable).

It was also predicted that the BSRI self-oriented measures would fail to correlate with Absorption scale scores. For the most part, this prediction was upheld. For both sets of male and female samples, Assertiveness failed to correlate with Absorption. The Self-Reliant scale did exhibit a small positive correlation with the Absorption scale for Survey males. The magnitude of this correlation, however, failed to differ from females in the Survey sample and failed to replicate for Comparison sample males. Self-oriented measures also failed to correlate with Davis' Fantasy scale.

While these results were generally consistent with previous research, they were inconsistent with Hirschman's (1985) interpretation of M-F scales and their predicted relationship with imaginative involvement. As discussed previously, Hirschman adopted a bipolar interpretation of traditionally defined M/F scales. Specifically, "femininity" was considered by Hirschman to be associated with

subjectivity, emotional expressiveness and receptivity and "masculinity" with objectivity, emotional control and assertiveness. Accordingly, Hirschman considered Absorption to be consistent with "feminine" traits and inconsistent with masculine traits. While zero order correlations did suggest a positive association between Interpersonal Sensitivity and Absorption for males, Absorption failed to negatively correlate with either of the self-oriented measures.

It is clear from Hirschman's interpretation of M-F scales that she expected "masculinity" attributes to inhibit Absorption. Consistent with this interpretation, Hirschman focused on the joint relationship of traditional BSRI scale scores to Absorption levels. In the present study, Hirschman's interpretation was further tested using a more structured measure of Absorption (i.e., the Absorption scale) and a more sensitive treatment of interpersonal orientation (i.e., orientation measures were kept continuous).

Generally, results for this study were inconsistent with Hirschman's predictions. For males in both Survey and Comparison samples, neither self oriented measures "interacted" with the other oriented measure in predicting Absorption. For females, however, some

interaction effects for other and self oriented measures were observed, particularly for females in the Comparison sample. Overall, the pattern of interactions observed for females were also inconsistent with Hirschman's predictions. Specifically, for Comparison females, a positive association between Interpersonal Sensitivity and Absorption was observed only when accompanied by high self-oriented scores. For Comparison females, this pattern was observed when either Self-Reliant or Assertiveness served as the self oriented measure. The point of intersection for the representative regression lines using either self-oriented measure were within the range of Interpersonal Sensitivity scores of interest. Interpersonal Sensitivity values below the point of intersection in both cases, however, tended to be low extreme Interpersonal Sensitivity values. For low extreme Interpersonal Sensitivity values, high values on self-oriented measures were associated with the lowest predicted Absorption scores. This finding does show some consistency with Hirschman's hypothesis. That is, for Comparison females extremely low on Interpersonal Sensitivity, higher self oriented scores were associated with the lowest predicted Absorption values. It must be emphasized, however, that this suggested

pattern was associated only with extreme low values on Interpersonal Sensitivity (i.e., lower than one standard deviation from the Interpersonal Sensitivity mean value). For Interpersonal Sensitivity values above the point of intersection, higher self oriented scores were clearly associated with higher predicted Absorption values than lower self oriented scores. This pattern was observed for a much broader range on the Interpersonal Sensitivity scale, including low, medium and high values.

Neither the suggested gender differences nor the "interactions" observed for these variables were predicted for this study. It was predicted that self oriented measures would remain unrelated to Absorption, even when jointly considered with other orientation. This prediction held only for males. Results for Comparison females, however, suggested that, jointly, interpersonal orientation (i.e., the interactive model) was a better predictor of Absorption levels than a mere additive model. Moreover, for a broad range of Interpersonal Sensitivity values, higher self oriented scores not only failed to "interfere" with predicted Absorption levels, they contributed to higher predicted Absorption values than when self orientation scores were

lower. Though "interaction" results were clearly modest in magnitude, this pattern held when either Self-Reliance or Assertiveness served as the measure of self-orientation. Finally, the results did not support the hypothesis that Self-Reliance and Assertiveness should be considered distinct dimensions.

Absorption, Interpersonal Orientation and Empathy

Stotland suggested that one of the basic elements in the process of empathy is an individual's level of imaginative involvement. From a developmental perspective, Stotland also suggested that imaginative involvement plays a primary role in the development of empathic tendency. The central theoretical importance given imaginative involvement suggests a strong relationship between involvement and Empathy measures. In this study, however, neither Davis' Fantasy scale, nor the Absorption scale with its extended range, meaningfully correlated with the Empathic Concern scale. Correlation magnitudes for both females and males were below the critical criterion set for this study. These findings are inconsistent with Stotland's suggestion that involvement plays a primary role in empathic responding.

An alternative interpretation of the interrelationship of these variables emphasizes the importance of other orientedness as a strong intervening variable. Possession of an other oriented perspective may be a necessary pre-requisite for empathic responding. This interpretation suggests a direct causal relationship between other orientation and empathy. As a result, the role Absorption plays in empathic responding may be moderated by one's level of other orientation. Specifically, this interpretation suggests that imaginative involvement plays a secondary role in empathic responding, perhaps by intensifying the empathic response of other oriented individuals.

Correlations between Interpersonal Sensitivity and Empathic Concern were consistent with suggestions that an other orientation plays a primary role in empathic responding. As expected, Interpersonal Sensitivity exhibited moderately high correlations with Empathic Concern in both male and female samples. The correlation magnitudes reported in Table 31 were somewhat lower than those found in previous research. Results, however, were still impressive, given that responses to the Interpersonal Sensitivity scale were collected during the mass testing session and responses to the Empathic Concern scale were

collected during the unrelated Survey Session.

To investigate whether the data were consistent with viewing other orientation as moderating the relationship between Absorption and empathy, the product term for Interpersonal Sensitivity and Absorption was tested with Empathic Concern as the criterion variable. This product term accounted for a meaningful proportion of unique variance in Empathic Concern scores for females and approached statistical significance for males. This product term was also statistically significant for all subjects combined.

Results for the joint relationship of Interpersonal Sensitivity and Absorption with Empathic Concern, however, provided only partial support for the predictions suggested above. For example, higher Interpersonal Sensitivity scores were associated with higher Empathic Concern scores, regardless of subjects level of Absorption. This finding does suggest that an other oriented perspective is important to empathy. When Interpersonal Sensitivity scores were higher, however, Absorption did not increase the already high Empathic Concern scores of these subjects. This finding failed to confirm predictions. Furthermore, results indicated that when Interpersonal Sensitivity scores were lower,

Absorption and empathy were positively related. This finding was not expected. If Interpersonal Sensitivity is a proxy for levels of other orientation, then lower Interpersonal Sensitivity scores should have been associated with lower Empathic Concern scores regardless of involvement levels. Absorption, however, did not enhance the Empathic Concern scores of those lower on Interpersonal Sensitivity to the Empathic Concern levels observed among those higher on Interpersonal Sensitivity. This finding does lend some support to suggestions that an other oriented perspective is of primary importance to empathic responding.

Some of the results for the joint relationship between Interpersonal Sensitivity and Absorption supported the hypothesis that an other oriented perspective plays a primary role in empathic responding. That Absorption appears to play a role in enhancing Empathic Concern among those exhibiting lower levels of other orientation was unexpected. Results did suggest, however, that the highest Empathic Concern scores were associated with those exhibiting higher levels of other orientation. With respect to the role of Absorption, it is possible that the already high Empathic Concern scores of other oriented individuals may have

produced a ceiling effect in this study. This would make the intensifying effect of Absorption on empathic behaviour for other oriented individuals impossible to detect. Alternatively, the pattern of results may indicate that there are "multiple behavioural paths" that lead to empathic responding. Stotland's suggestion that imaginative involvement (i.e., absorption) contributes to empathic responding, therefore, may also have some merit.

Interpersonal Orientation Measures

The revised version of Bem's BSRI scale used in Study 3 was based on factor analytic results generated in previous research (e.g., Pedhazur and Tetenbaum, 1979; Gardreau, 1977). This previous research, as well as theoretical criticism, strongly supported modification of Bem's "Femininity" scale. Result generated in Study 3 suggested that the revised scale, Interpersonal Sensitivity, produced patterns of results similar to comparable scales (e.g., PAQ) in previous research (e.g., Davis, 1983; Lubinski, et al., 1983). Specifically, Interpersonal Sensitivity correlated as predicted with Absorption, Empathic Concern, and empathy related variables (e.g., Perspective Taking; Denial-Avoidance). As well,

Interpersonal Sensitivity exhibited a statistically significant, though marginal correlation with Jones and Crandall's (1986) shortened Self-Actualization scale.

While researchers have seen the need to modify Bem's BSRI-F scale, few have considered the factor purity of the BSRI-M scale. Division of Bem's Masculinity scale into two separate scales has some factor analytic support (see Table 22), however, inclusion of separate scales in Study 3 was purely exploratory. Little evidence emerged to support the treatment of Self-Reliance and Assertiveness as distinct dimensions. The Self-Reliant and Assertiveness scales exhibited a high degree of convergence, with correlations all above $r=.55$ for both males and females in the Survey and Comparison samples. These scales also produced similar results across a number of variables, including Absorption, empathy related variables and Self-Esteem. Both of these measures also failed to reliably correlate with Interpersonal Sensitivity. Moreover, contrary to predictions, Assertiveness failed to produce reliable and meaningful gender differences (males and females also failed to differ on the Self-Reliant scale). Only correlation magnitudes associated with Self-Actualization hinted at possible differences across

these self-oriented scales. Self-Reliance exhibited a moderately strong correlation with Self-Actualization. Assertiveness, however, failed to correlate with Self-Actualization for females and produced only a marginal correlation for males. The majority of results in Study 3, however, clearly suggested that Self-Reliance and Assertiveness do not represent meaningfully distinct dimensions.

Finally, as predicted, other-orientation (i.e., Interpersonal Sensitivity) and self-orientation (i.e., Self-Reliance and Assertiveness) did emerge as independent dimensions in this study. For only one sample, Survey females, did other and self oriented measures (Interpersonal Sensitivity and Self-Reliant) produce a meaningful correlation, as defined in this study. The meaningful correlation for these two variables failed to replicate for Criterion females. A primary interest of Study 3, however, was also the joint relationship of these two variables with respect to a number of criterion variables. Table 40 summarizes the hypotheses tested. As previously discussed, the joint relationship of Interpersonal Sensitivity and Self-Reliance (i.e., other and self oriented measures) did predict more variance in Absorption scores than a mere additive model involving these two variables, though this relationship

Table 40. Summary of Results for Planned Tests Involving the Joint Relationship of Self Oriented (Self-Reliance) and Other Oriented (Interpersonal Sensitivity) Variables.

	Status of Joint Relationship	
	Females	Males
<u>Criterion Variables</u>		
Absorption		
<i>Survey Sample</i>	trend	ns
<i>Comparison Sample</i>	significant	ns
Survey Sample Only		
Self-Esteem	trend	significant
Perspective-Taking	ns	ns
Self-Actualization	ns	ns

may be accurate for females only. As well, the other X self "interactive" model also produced meaningful results when Self-Esteem served as the criterion variable (though the pattern of results for this interactive model suggested a different relationship for females and males, see *Gender Difference: A Review of Findings*).

For two other criterion variables, Perspective-Taking and Self-Actualization, however, the other X self "interactive" model failed to produce meaningful results. For Perspective-Taking, the investigation of the interactive model was purely exploratory. For Study 3, it was hypothesized that Perspective-Taking may reflect more than just a capacity for nonegocentric thought (Davis' definition, 1983). Specifically, it was suggested that positive responses to Perspective-Taking items may indicate individuals that give weight to all perspectives in an interpersonal situation, including their own (i.e., self-oriented perspective). As indicated in Table 40, this interpretation was not supported. As predicted by Davis, however, Perspective-Taking exhibited a meaningful, though modest relationship with other orientation for both Survey females and males. Self-orientation (i.e., Self-Reliance) did predict unique variance in Perspective-Taking scores,

but only for Survey males (see Appendix R-12).

For Self-Actualization, the joint relationship of self and other oriented measures was expected to produce meaningful results. The importance of self and other oriented perspectives for self-actualized persons has been central in the writings of researchers working in this area (e.g., Jones & Crandall, 1950; Knapp & Knapp, 1978; Rogers, 1962a, 1962b; Riesman, Glazer & Denney, 1950; Shorstrom, 1964). Negative results for this study, however, should be considered in light of the population of interest. Self-Actualization is envisioned by most researchers in this area as a life-time goal or final stage in the psychological development of the person. It may be that very few, if any of the psychology 100 students included in this study have actually reached this stage of development. Moreover, this may mean that a limited number of subjects in this study scored high on both self and other oriented measures. This interpretation would have implications for other results in Study 3 which looked at the joint relationship of self and other orientation. Further, research is necessary with other populations to see whether the positive results generated in this study (see Table 40) generalize to other populations and whether null results

produced here hold for other populations as well.

Gender Differences: A Review of Findings

Possible gender differences were explored on a number of levels, including not only mean value differences for most variables, but also in terms of correlation magnitudes generated and the pattern suggested for joint relationships of interest in this study. With respect to mean value differences, Survey females and males were compared on Absorption, Empathy related variables and BSRI-Revised scales generated for Study 3. While the mean values for Survey females and males failed to differ for Absorption, both Empathic Concern and Denial-Avoidance (i.e., avoidance of empathy) produced meaningful gender differences. The mean value for females was significantly higher for Empathic Concern and significantly lower for Denial-Avoidance in comparison to the mean values for males. These results were consistent with predictions and the results of previous research (e.g., Davis, 1982, 1983; Stotland, et al., 1978).

For BSRI-Revised scales, meaningful gender differences were also predicted for Interpersonal Sensitivity and tentatively predicted for

Assertiveness. Specifically, it was predicted that females would exhibit higher mean values than males on Interpersonal Sensitivity and lower mean values than males on Assertiveness. Results, however, failed to confirm predictions. Statistically significant gender differences were observed for both Interpersonal Sensitivity and Assertiveness in the Survey sample and these differences were in the direction predicted. The magnitude of gender differences, however, were small. For Interpersonal Sensitivity, the results for individuals not participating in the Survey (i.e., Comparison sample) were similar. Though the higher mean values observed for Comparison females differed statistically from the mean values for Comparison males, the magnitude of this difference was still comparatively small. The Comparison sample also failed to produce a statistically significant gender difference for Assertiveness.

Zero-order correlations generated in this study also produced some interesting and some unexpected gender differences. For example, correlations for Denial-Avoidance with Empathic Concern, Absorption and Interpersonal Sensitivity produced the most consistent and unexpected gender differences. For Survey males, Denial-Avoidance

produced strong to moderately strong negative correlations with all of these variables. While Denial-Avoidance produced negative correlations with all these variables for Survey females, only the negative correlation between Denial-Avoidance and Empathic Concern reached the $r = \pm .30$ criteria cut-off for meaningfulness. One possible explanation for these results is that lower correlations for Survey females resulted because of limited variability of the Denial-Avoidance scale. Recall that females exhibited a significantly lower mean value on Denial-Avoidance than males. In addition, a marginally significant homogeneity of variance test on Denial-Avoidance suggested that females exhibited somewhat less variability on this scale than males. Finally, Empathic Concern failed to produce the same gender differences observed for Denial-Avoidance. Correlation magnitudes for Empathic Concern with Interpersonal Sensitivity and for Empathic Concern with Absorption were very similar for Survey females and males.

As predicted, correlations among BSRI-Revised scales failed to produce meaningful gender differences. However, one of the most interesting gender differences emerged for Interpersonal Sensitivity and Absorption. In the Comparison sample, males exhibited a significantly

stronger positive correlation between these two variables than Comparison females. Results for males and females in the Survey sample showed a similar trend. For both Survey and Comparison samples, Absorption and Interpersonal Sensitivity produced a moderately strong correlation for males (around $r=.40$). For females in both samples, however, these variables failed to produce meaningful correlations ($r < .30$). Limited research has been conducted on the relationship of Absorption or related constructs with other-oriented measures. Lubinski, et al. (1983) reported marginal correlations for the PAQ-F and BSRI-F with the Absorption scale ($r=.26$ and $r=.31$, respectively). Correlations reported, however, were for a mixed gender sample only. Davis (1983) also reported marginal correlations for the PAQ-F and his Fantasy scale. The pattern of gender difference observed in this study was also suggested in Davis' study, with PAQ-F and Fantasy correlating $r=.15$ for females and $r=.29$ for males.

It is difficult to determine from this limited research whether gender correlation differences for Absorption and Interpersonal Sensitivity is reliable. The replication of this difference in Study 3 does provide persuasive support that Absorption and Interpersonal Sensitivity

(i.e., other orientation) meaningfully correlate for males, but not for females. Attempting to determine why this pattern emerges for males and females suggests an interesting avenue for future research. The joint relationship of interpersonal orientation measures with Absorption generated in Study 3, however, suggested that the answers may not be straightforward. Specifically, results suggested that, for females, the strength of the relationship between other orientation (i.e., Interpersonal Sensitivity) and Absorption may be moderated by females' level of self orientation (see previous discussion). Gender differences with respect to this moderating effect, however, were only produced for the Comparison sample and only when Self-Reliance served as the self-oriented measure.

Finally, gender differences were also observed for the joint relationship of Interpersonal Sensitivity and Self-Reliance with Self-Esteem. In Study 3, the Interpersonal Sensitivity X Self-Reliance interaction term with Self-Esteem was statistically significant for Survey males and exhibited a trend toward statistical significance for females. More importantly, however, the pattern of suggested interactions were different from females and males. In general,

Self-Reliance exhibited a positive association with Self-Esteem, regardless of Interpersonal Sensitivity levels, though the strength of this relationship was slightly stronger for males than females (zero-order correlations, however, failed to differ statistically). Results also indicated, however, that for subjects lower on Self-Reliance, Interpersonal Sensitivity levels had a differential impact for males and females. For males low on Self-Reliance, higher Interpersonal Sensitivity appeared to "suppress" already lower predicted Self-Esteem scores. Conversely, for females low of Self-Reliance, higher Interpersonal Sensitivity appeared to "enhance" slightly Self-Esteem scores. These results are only suggestive, particularly for females, since the interaction term of interest failed to reach the statistical significance criteria set for this study. The suggested patterns, however, underscore the pitfalls of analyzing mixed gender samples without first examining the results for males and females separately. In fact, when the Interpersonal Sensitivity X Self-Reliance interaction with Self-Esteem was tested, collapsing across gender, results suggested no interaction ($t_{(200)} < 1$). On a general level, the results for this study were consistent with previous research, where

higher "masculinity" scores have been associated with higher Self-Esteem, regardless of the subjects' level on "femininity" scales (see Whitley, 1983, for a review). The differential relationship between Self-Esteem and other orientedness (traditionally termed "femininity") for males and females with self orientation is lower, however, is not an issue that has emerged in previous research and warrants further study.

Performance of Absorption Scale

A number of results generated in Study 3 suggested that the extended range of the Absorption scale strengthened the predictive power of this involvement measure in comparison to Davis' Fantasy Scale. For example, only the Absorption scale significantly correlated with Interpersonal Sensitivity, albeit only for males. The Fantasy scale failed to correlate with Interpersonal Sensitivity in either male or female samples.

In addition, Absorption scores also showed a unexpectedly strong correlation with Private Self-Consciousness for males and a meaningful, though marginal correlation for females, suggesting that Absorption may contribute to the prevalence of introspective thoughts associated with

planning, problem-solving and self-understanding. The Fantasy scale failed to exhibit as strong correlations with Private Self-Consciousness as the Absorption scale, particularly for males. Finally, the predictive power of the Absorption subfactors generated in Study 1 failed to prove superior to the Absorption scale as a whole with the variables in Study 3 (see Appendix R-10).

It would appear that the range of experiences tapped by the Absorption scale produce more stable tool for measuring subjects' tendency toward Absorption (or imaginative involvement). This conclusion, however, is tentative since the results reported here are only suggestive. While Absorption did produce stronger correlations than the Fantasy scale for Interpersonal Sensitivity and Private Self-Consciousness, for the most part, correlation differences were not statistically significant. However, the strength of the relationship between Absorption and these variables in this study was also stronger than correlations produced in previous research (e.g., Davis, 1983; Hirschman, 1985). These findings together would suggest that the Absorption scale generalizes to other areas of research where a synonymous aptitude has been hypothesized.

General Discussion

The three studies presented, though diverse in their content, were linked by their focus on Absorption (as measured by the Absorption scale). Study 1 focused on the "dimensionality" of Absorption. Results supported Tellegan and Atkinson's original conceptualization of Absorption as unidimensional, though their original interpretation of the "process" underlying Absorption was questioned. Study 2 focused on the predictive power (and context dependency relationship) of Absorption with respect to hypnotic behaviour, the area of research within which the Absorption scale was "born". Results indicated that the relationship between Absorption and susceptibility, modest though it may be, does exhibit context effects. Furthermore, results from Study 2 also suggested that the structure of the hypnotic context may serve to alter Absorption scores, rather than susceptibility. Recall that a marginal context effect was found for subjects who completed the Absorption scale after susceptibility scores had been established. Further clarifying this issue is an important focus for future research (see Study 2 - Discussion).

Finally, Study 3 investigated the predictive power of the Absorption

scale in other areas of research where notions of Absorption or imaginative involvement have been introduced. Results indicated that the strength of the relationship of the Absorption scale was "as good" if not slightly better than more restrictive measures of involvement (i.e., Davis' Fantasy scale; Absorption subscales) with respect to measures of other-orientation (i.e., interpersonal sensitivity), empathy (and related measures) and private self-consciousness.

There are advantages to confirming the generalizability of Absorption (measured by the Absorption scale) to other areas of research. To date, researchers working in different areas have tended to develop their own specific involvement measures for their own specific area. Though researchers within a specific area may share the same measure, there is little, if any, sharing of these measures across areas. In particular, this has been true of the Absorption scale. While the Absorption scale has been uniformly adopted by both state and non-state theorists within the area of hypnosis, its use has been slow to generalize to other areas of research. This inward focus of researchers, of course, makes it difficult to develop a global picture of Absorption (or imaginative involvement) across research areas of psychology. It would

appear, however, that the Absorption scale, with its extended range of related experiences, may make it a worthy candidate as a research tool for other areas of research.

This researcher was particularly impressed with the construction of many items on the Absorption scale, which appear "context neutral". That is, many items on the scale invite the individual to look across their experiences and determine whether there has been any context that has sparked the type of experiences described. Factor analytic results generated in Study 1 suggested that many of the context neutral items on the Absorption scale also cluster together more readily. This may be because, when responding to these Absorption items, individuals are not required to match both the type of experiences described with a specific context. However, many of these items were confounded with difficulty level (i.e., were more difficult), which may have contributed to their stronger association. Further research, which attempts to develop context neutral items reflecting "easier" Absorption levels may help to clarify this issue.

It is interesting to note that Roche and McConkey (1990) recently criticized the Absorption scale as too restricted in terms of the

situations included in the scale. These authors pointed to recent developments in personality theory, which have begun to seriously investigate the possibility of "openness to experience" as another major personality dimension (see Coan, 1972; McCrae and Costa, 1985; 1987). It is true that the dimension of "openness to experience" envisioned by these researchers is broader in scope, being described by a variety of adjectives, such as imaginativeness, originality, daring, curiosity and liberalism. Recently, Glinsky, et al. (1990), however, demonstrated that Absorption (measured via the Absorption scale) was associated with some, but not all aspects of "openness to experience" scales and that maintaining Absorption as conceptually distinct may be more appropriate. These researchers argued, "openness" may be a good summary label for this broad dimension of individual differences, but "...more focused analyses of the correlates, determinants and consequences of openness may find it more appropriate to maintain a distinction among its various aspects (p. 21)."

Footnotes

¹The type of experiences comprising involvement measures in Empathy research are highly similar to the types of experiences J. Hilgard (1979) attempted to associate with hypnotic susceptibility. Particularly, Hilgard emphasized, and investigated in some detail, the relationship of hypnotic susceptibility to levels of reading involvement.

²Within the area of hypnosis, the two versions of the Absorption scale have been treated as synonymous. In fact, some who have used the 34 item Absorption scale (Tellegen, 1976) have often cited Tellegen and Atkinson's (1974) original article as the sole primary source. The original 20 item Absorption scale is contained within Tellegen's revision. While important differences between the 20 and 34 item scales may emerge, for simplicity of presentation previous results pertaining to the two versions will be treated as synonymous. It should be noted that most laboratories using the Absorption scale in recent years have focused almost exclusively on the 34 items Absorption scale.

³It should be stressed that this study was envisioned as an exploratory factor analysis which attempted to investigate the dimensionality of the concept of absorption. It was not an attempt at

scale construction, per se. Because of the popularity and extensive use of the Absorption scale, only in the presence of strong evidence that the scale was multidimensional would restructuring of the scale have been recommended. Consequently, to clearly investigate the issue of dimensionality, this researcher did not force the inclusion of all Absorption items into factor analyses.

⁴Although responses to the Absorption scale for this sample were gathered during the previous academic year (in comparison to the Criterion sample) this sample was designated as the Replication sample for reasons described in the body of the paper: sample size and context within which responses were gathered (i.e., hypnotic susceptibility testing). It should also be noted that whether or not English was the first language of these subjects was not known.

⁵Since analyses were exploratory and the dimensionality of absorption was the primary issue, the strong factor similarity across females and males was emphasized rather than the few differences emerging for individual items. If the overall factor structure for females and males had been different at this initial stage, this exploratory analysis would have taken a different course.

⁶Recall that subjects included in the Replication sample completed the Absorption scale just prior to susceptibility testing. These sessions were run by experimenters associated with the Hypnosis Laboratory at Carleton University. Experimenters running these sessions are required to review questionnaires prior to testing to ensure subjects have answered all questions by circling an appropriate number. If subjects are unsure how to respond, researchers have been instructed to ask subjects to estimate their response. Researchers, however, are not allowed to help respondents interpret questions.

⁷Generalizing these results to a statement regarding the Absorption scale as a whole was adopted because of results observed during the initial stages of data cleaning. Particularly, preliminary results for unrotated PCA for both females and males in the Criterion and Replication samples indicated that virtually all variables loaded above .45 on the first principal component.

⁸Case outliers were included to increase the generalizability of results. Calculations, however, were pursued with and without case outliers. Results were similar. Therefore, only results with case outliers have been reported.

⁹ A number of studies have also found the mean values for females on the Absorption scale to be higher than the mean values for males on the Absorption scale (Crawford, 1982; Farthing, et al., 1983; Spanos, Brett, et al., 1986; Spanos & McPeake, 1975a; Yancher & Johnson, 1981), with one exception (Finke & MacDonald, 1978). The magnitude of gender differences for the Absorption scale have often been small, and whether a meaningful difference exists is unclear. Slightly higher mean values on the Absorption scale for females may help to explain slightly higher correlations between Absorption and susceptibility scores for female subjects in comparison to male subjects. Generally for this thesis, gender differences on the Absorption scale were not found.

¹⁰ The approaches taken in both these experiments made it difficult for these authors to assess Council, et al.'s (1986) interpretation of context dependency. Council, et al. suggested that completing the Absorption scale in the hypnotic context changes how subjects respond during susceptibility testing. Nadon, et al. recognized that their within groups design for Experiment 1 made it impossible for them to test this interpretation. Though a between group design was selected for their second experiment, these authors confounded their investigation of

Absorption and context effects by introducing a questionnaire related to Absorption into the experimental design. One group of subjects completed the Absorption scale in the context of susceptibility testing, while a second group completed the Absorption scale in a context unrelated to hypnosis. For this second group, however, Nadon, et al. introduced a Relaxation Questionnaire just prior to susceptibility testing. If Council, et al.'s interpretation is correct, then completing the Relaxation Questionnaire may have changed expectancies, which in turn may have influenced hypnotic responsiveness.

¹¹For this study, Absorption item estimations were based on the average value of all other Absorption items for a particular subject. Only a very small number of subjects required such mean value estimations and this approach was perceived as "more precise" at the time these analyses were conducted. Comparison, however, was made with the method of using mean value substitution based on all subjects for a particular item (all subjects being defined as consistent with gender). This approach did not make a difference, so the method adopted originally was maintained.

¹²The pattern of missing values, however, did not change the

sample size associated with the between groups testing of the context dependency hypothesis. For the Prior to Hypnosis Condition, hypnosis session Absorption scores for this analysis were used for this comparison. The one female subject missing a mass testing Absorption score for this group did have the critical Hypnosis Absorption score. For the After Hypnosis condition, critical Absorption scores for testing context dependency were those generated in the mass testing session. Again the one female subject missing a hypnosis session Absorption score did have the critical mass testing Absorption score.

¹³ It should be noted that heteroscedasticity is one possible consequence of plotting a normally distributed variable against a variable that is highly skewed (see Tabachnick and Fidell, 1983). Coefficients of skewness for susceptibility measures (see Appendix B-1), however, indicated that neither CURSS:O nor CURSS:S scores were severely skewed. Therefore, it seems unlikely that low correlation magnitudes observed in this study may be attributed to statistical artifact.

¹⁴Correlations among subscales generated in Study 1 and CURSS:O test suggestion scores and CURSS:S test suggestion scores were also

reviewed. None of the subscales produced consistently superior results to the overall Absorption scale. In addition, correlation magnitudes associated with subscales did not consistently increase as a function of difficulty.

¹⁵The description of absorbing experiences included in Hirschman's study: "Involved in the experience. I'm carried off into it; feel as if I were part of it, feel deeply all that happens; sort of "give myself up" to it; may carry the experience around for a time."

¹⁶The arousal level of subjects in Stotland's studies were measured twice: Once while they observed the demonstrator participate in a "neutral" treatment and once while they observed the demonstrator participate in the "painful" treatment. In these studies arousal levels were significantly higher when subjects observed the "painful" treatment in comparison to the "neutral" treatment.

¹⁷The data for this study was also visually analysed for the presence of multivariate outliers and for the possibility of nonlinear relationships for these data. The author had access to Macintosh's MacSpin program which allowed the plotting of two variables (2-dimensional space) and three variables (3-dimensional space).

Extensive time was spent by this researcher "getting to know" her data. These data did not produce either extreme multivariate outliers or nonlinear relationships.

¹⁸The sample sizes reported in the body of this paper represent the final sample size for the Comparison groups. Two males, however, were dropped because of too many missing values on the Absorption scale (see also Study 1) and one male was dropped because of too many missing values on the BSRI ($n > 4$). Two females were also dropped because of too many missing values on the BSRI. A very small number of subjects had one or two missing values for these scales and the mean estimation approach described for subjects in the Survey sample were used to estimate missing data.

¹⁹A test of the difference between two non-independent r 's revealed a statistically significant difference between correlations for male subjects only ($t_{(98)} = 2.22, p < .05$).

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Appendix A

The 34-Item Absorption Scale

PLEASE CIRCLE THE APPROPRIATE NUMBER.

(1 = Never; 4 = Very Frequently)

1. Sometimes I feel and experience things as I did when I was a child.

Never 1 2 3 4 Very Frequently

2. I can be greatly moved by eloquent or poetic language.

Never 1 2 3 4 Very Frequently

3. While watching a movie, a T.V. show, or a play, I may become so involved that I forget about myself and my surroundings and experience the story as if it were real and as if I were taking part in it.

Never 1 2 3 4 Very Frequently

4. If I stare at a picture and then look away from it, I can sometimes "see" an image of the picture, almost as if I were still looking at it.

Never 1 2 3 4 Very Frequently

5. Sometimes I feel as if my mind could envelop the whole world.

Never 1 2 3 4 Very Frequently

6. I like to watch cloud shapes change in the sky.

Never 1 2 3 4 Very Frequently

7. If I wish, I can imagine (or daydream) some things so vividly that they hold my attention as a good movie or story does.

Never 1 2 3 4 Very Frequently

8. I think I really know what some people mean when they talk about mystical experiences.
- Never 1 2 3 4 Very Frequently
9. I sometimes "step outside" my usual self and experience an entirely different state of being.
- Never 1 2 3 4 Very Frequently
10. Textures-such as wool, sand, wood- sometimes remind me of colours or music.
- Never 1 2 3 4 Very Frequently
11. Sometimes I experience things as if they were doubly real.
- Never 1 2 3 4 Very Frequently
12. When I listen to music, I can get so caught up in it that I don't notice anything else.
- Never 1 2 3 4 Very Frequently
13. If I wish, I can imagine that my body is so heavy that I could not move it if I wanted to.
- Never 1 2 3 4 Very Frequently
14. I can often somehow sense the presence of another person before I actually see or hear her/him.
- Never 1 2 3 4 Very Frequently
15. The crackly and flames of a wood fire stimulate my imagination.
- Never 1 2 3 4 Very Frequently

16. It is sometimes possible for me to be completely immersed in nature or in art and to feel as if my whole state of consciousness has somehow been temporarily altered.

Never 1 2 3 4 Very Frequently

17. Different colours have distinctive and special meanings for me.

Never 1 2 3 4 Very Frequently

18. I am able to wander off into my own thoughts while doing a routine task and actually forget that I am doing the task, and then find a few minutes later that I have completed it.

Never 1 2 3 4 Very Frequently

19. I can sometimes recollect certain past experiences in my life with such clarity and vividness that it is like living them again or almost so.

Never 1 2 3 4 Very Frequently

20. Things that might seem meaningless to others often make sense to me.

Never 1 2 3 4 Very Frequently

21. While acting in a play, I think I could really feel the emotions of the character and "become" her/him for the time being, forgetting both myself and the audience.

Never 1 2 3 4 Very Frequently

22. My thoughts often don't occur as words but as visual images.

Never 1 2 3 4 Very Frequently

23. I often take delight in small things (like the five-pointed star shape that appears when you cut an apple across the core or the colours in soap bubbles).
- Never 1 2 3 4 Very Frequently
24. When listening to organ music or other powerful music, I sometimes feel as if I am being lifted into the air.
- Never 1 2 3 4 Very Frequently
25. Sometimes I can change noise into music by the way I listen to it.
- Never 1 2 3 4 Very Frequently
26. Some of my most vivid memories are called up by scents and smells.
- Never 1 2 3 4 Very Frequently
27. Certain pieces of music remind me of pictures or moving patterns of colour.
- Never 1 2 3 4 Very Frequently
28. I often know what someone is going to say before he or she says it.
- Never 1 2 3 4 Very Frequently
29. I often have "physical memories"; for example, after I've been swimming I may still feel as if I'm in the water.
- Never 1 2 3 4 Very Frequently
30. The sound of a voice can be so fascinating to me that I can just go on listening to it.
- Never 1 2 3 4 Very Frequently

31. At times I somehow feel the presence of someone who is not physically there.

Never 1 2 3 4 Very Frequently

32. Sometimes thoughts and images come to me without the slightest effort on my part.

Never 1 2 3 4 Very Frequently

33. I find that different odors have different colours.

Never 1 2 3 4 Very Frequently

34. I can be deeply moved by a sunset.

Never 1 2 3 4 Very Frequently

Appendix B

Study 1 - Additional Results

Appendix B-1. Males in the Criterion Sample (n=254): Means, Standard Deviations, and Coefficients of Skewness for All 34 Absorption Items, Ordered by Magnitude of Means.

Variable	Mean	Standard Deviation	Skewness	Proposed Factor
A20	2.98	.852	-.35	I
A12	2.95	1.007	-.52*	n/a
A7	2.88	.963	-.45*	n/a
A19	2.87	.898	-.37	I
A32	2.79	1.002	-.35	I
A22	2.78	1.004	-.31	I
A18	2.73	1.015	-.31	n/a
A28	2.69	.898	-.08	n/a
A4	2.68	1.002	-.22	n/a
A34	2.67	1.010	-.12	R
A15	2.62	1.059	-.13	R
A26	2.58	1.006	-.13	S
A14	2.55	1.038	-.13	n/a
A17	2.49	.974	-.03	S
A3	2.43	1.010	.08	n/a
A6	2.38	.932	.06	R
A27	2.36	1.113	.16	S
A23	2.36	1.041	.19	R
A1	2.35	.770	.15	n/a
A25	2.29	1.063	.28	n/a
A16	2.28	1.092	.22	n/a
A30	2.24	1.018	.29	n/a
A29	2.22	1.075	.29	n/a
A2	2.20	1.014	.30	R ^a
A8	2.10	1.009	.50*	M
A11	2.10	.971	.54*	M
A21	2.07	.991	.35	n/a
A31	2.00	.945	.45*	M
A24	1.99	1.010	.67*	n/a
A5	1.87	.911	.77*	M
A9	1.78	.916	.91*	M
A33	1.74	.836	.88*	S
A10	1.71	.942	1.11*	S
A13	1.66	.884	1.20*	n/a

^a Reality Absorption item initially included, but dropped at interpretation stage.

*Skewness(critical) = .39, $p < .01$.

R=Reality Absorption; I=Introspective Absorption; M=Mysticism; S=Synesthesia.
n/a=Absorption items not included in final Factor Analysis.

Appendix B-1 (Continued). Females in the Criterion Sample (n=258): Means, Standard Deviations, and Coefficients of Skewness for All 34 Absorption Items, Ordered by Magnitude of Means.

Variable	Mean	Standard Deviation	Skewness	Proposed Factor
A19	3.09	.834	-.53*	I
A34	3.07	.893	-.56*	R
A20	2.98	.821	-.38	I
A7	2.96	.899	-.47*	n/a
A15	2.86	.958	-.44*	R
A3	2.84	.912	-.37	n/a
A12	2.81	.995	-.25	n/a
A18	2.80	1.025	-.40*	n/a
A26	2.79	1.012	-.31	S
A28	2.78	.901	-.13	n/a
A6	2.73	.919	-.13	R
A14	2.68	.928	-.15	n/a
A17	2.65	.976	-.14	S
A32	2.62	.963	-.15	I
A2	2.59	.909	-.04	R ^a
A4	2.59	.973	-.09	n/a
A23	2.57	1.020	-.10	R
A22	2.52	1.007	.01	I
A30	2.43	1.020	.10	n/a
A1	2.38	.831	.06	n/a
A16	2.33	1.044	.16	n/a
A21	2.32	1.059	.20	n/a
A29	2.32	.995	.22	n/a
A8	2.21	.963	.39	M
A31	2.16	.958	.33	M
A27	2.14	.975	.43*	S
A11	2.12	.960	.40*	M
A24	2.05	1.031	.46*	n/a
A25	1.94	.938	.59*	n/a
A33	1.85	.959	.91*	S
A5	1.83	.791	.60*	M
A13	1.77	.942	.95*	n/a
A10	1.70	.889	1.06*	S
A9	1.69	.818	1.05*	M

^a Reality Absorption item initially included, but dropped at interpretation stage.

*Skewness(Critical) = .39, $p < .01$.

R=Reality Absorption; I=Introspective Absorption; M=Mysticism; S=Synesthesia.
n/a=Absorption items not included in final Factor Analysis.

Appendix B-2. For Females and Males in the Criterion Sample: Squared Multiple Correlations for all 34 Absorption items.

Variable	Females	Males
A1	.217	.357
A2	.339	.405
A3	.287	.288
A4	.343	.393
A5	.429	.469
A6	.423	.340
A7	.368	.428
A8	.519	.480
A9	.465	.479
A10	.531	.474
A11	.451	.525
A12	.421	.386
A13	.419	.304
A14	.426	.396
A15	.439	.477
A16	.610	.521
A17	.503	.480
A18	.347	.406
A19	.432	.499
A20	.616	.444
A21	.411	.347
A22	.429	.380
A23	.556	.501
A24	.486	.485
A25	.386	.464
A26	.311	.384
A27	.449	.532
A28	.407	.460
A29	.395	.454
A30	.428	.410
A31	.485	.396
A32	.513	.489
A33	.404	.454
A34	.483	.506

Results for 258 females and 254 males.

Appendix B-3. Absorption Items Designated as Outlier Variables in Preliminary Factor Analyses.

- A1** Sometimes I feel and experience things as I did when I was a child.
- A4** If I stare at a picture and then look away from it, I can sometimes "see" an image of the picture, almost as if I were still looking at it.
- A13** If I wish, I can imagine that my body is so heavy that I could not move it if I wanted to.
- A29** I often have "physical memories"; for example, after I've been swimming I may still feel as if I'm in the water.
- A30** The sound of a voice can be so fascinating to me that I can just go on listening to it.

Appendix B-4. Females in the Criterion Sample: Pattern Matrix for Five Factor Oblique Solution with 29 Absorption Items.

Variables	I Reality Absorption	II Introspective Absorption	III Synesth.	IV Mysticism	V Uninterpreted
A16	.675				
A34	.665				
A23	.645				
A6	.642				
A15	.531				
A20		.728			
A19		.615			
A32		.496			
A22		.443	.301		
A33			.725		
A27			.589		
A10			.567		
A9				.709	
A11				.621	
A8				.493	
A2	.359				.381
A21		.383			.316
A14		.300		.300	-.323
A28		.356			
A24			.400		
A25			.378		
A17			.365		
A26			.362		
A31				.385	
A5				.321	
A18					
A7					
A12					
A3					

Pattern loadings less than .30 have been omitted.

Loadings in bold indicate those ABS items retained for final factor analysis, four factor solution

Appendix B-4 (Continued). Males in the Criterion Sample (n=242):
Pattern Matrix for Five Factor Oblique Solution with 29 Absorption
Items.

Variables	I Reality Absorption	II Introspective Absorption	III Synesth.	IV Mysticism	V Uninterpreted
A32	.757				
A22	.609				
A23	.501			.307	
A20	.486				
A18	.485				
A7	.405		.396		
A33		.680			
A27		.621			
A17		.606			
A10		.513			
A26		.493			
A8			.608		
A9			.598		
A5			.563		
A11		.322	.482		
A31			.406		
A34				.948	
A15				.509	
A6				.471	
A24					-.330
A25					-.283
A14					.396
A19	.377				
A28	.372				
A21	.361				
A3	.359				
A12	.322				
A16		.362		.321	
A2				.308	

Pattern loadings less than .30 have been omitted.

Loadings in bold indicate those ABS items retained for final factor analysis, four factor solution.

Appendix B-4 (Continued). Females in the Criterion Sample (n=245):
Structure Matrix for Five Factor Oblique Solution with 29 Absorption
Items.

Variables	I Reality Absorption	II Introspective Absorption	III Synesth.	IV Mysticism	V Uninterpreted
A16	.793	.425	.515	.505	
A34	.685	.390	.373		
A23	.703	.361	.479		
A6	.634		.301	.335	
A15	.623	.391	.449	.396	
A20	.438	.788	.474	.440	
A19	.372	.633		.361	
A32	.360	.652	.431	.518	
A22	.343	.589	.509	.393	
A33		.354	.690		
A27	.461	.378	.675	.351	
A10	.456	.383	.676	.441	
A9	.326	.420	.360	.731	
A11	.401	.395	.420	.689	
A8	.519	.553	.432	.690	
A2	.467				.464
A21	.391	.539	.416	.381	.391
A14	.335	.494	.247	.492	
A28	.348	.526	.335	.477	
A24	.529	.362	.575	.341	.326
A25	.393	.339	.517	.386	
A17	.538	.513	.590	.326	
A26	.410	.302	.510	.411	
A31	.338	.594	.387	.595	
A5	.410	.441	.412	.517	.343
A18	.284	.434	.444	.425	
A7	.439	.396	.412	.393	
A12	.473	.494	.498	.358	
A3					

Structure loadings less than .30 have been omitted.

Loadings in bold indicate those ABS items retained for final factor analysis, four factor solution

Appendix B-4 (Continued). Males in the Criterion Sample (n=242):
Structure Matrix for Five Factor Oblique Solution with 29 Absorption
Items.

Variables	I Reality Absorption	II Introspective Absorption	III Synesth.	IV Mysticism	V Uninterpreted
A32	.765	.452	.369	.389	
A22	.576	.309			
A23	.612	.408		.539	
A20	.629	.420	.447	.394	
A18	.576	.368	.385	.333	
A7	.525		.539		
A33	.351	.685	.391		
A27	.552	.724	.329	.391	
A17	.470	.697	.379	.363	
A10	.411	.628	.445	.377	
A26	.425	.558			
A8	.403	.446	.694	.326	
A9	.420	.374	.680	.356	
A5	.447	.368	.642	.351	
A11	.457	.547	.645		
A31	.395	.424	.545		
A34	.352			.868	
A15	.437	.461		.613	
A6	.362		.329	.541	
A24	.475	.473	.367	.470	-.341
A25	.467	.532	.473	.305	
A14	.391	.386	.453		.400
A19	.584	.488	.452	.385	
A28	.539	.385	.434	.374	
A21	.461	.379			
A3	.443	.287			
A12	.506	.455		.383	
A16	.500	.589	.409	.554	
A2	.460	.361	.369	.492	

Structure loadings less than .30 have been omitted.

Loadings in bold indicate those ABS items retained for final factor analysis, four factor solution

Appendix B-5. Absorption Items Not Included in Stage 2 Factor Analyses.

- A3 While watching a movie, a T.V. show, or a play, I may become so involved that I forget about myself and my surroundings and experience the story as if it were real and as if I were taking part in it.
- A16 It is sometimes possible for me to be completely immersed in nature or in art and to feel as if my whole state of consciousness has somehow been temporarily altered.
- A21 While acting in a play, I think I could really feel the emotions of the character and "become" her/him for the time being, forgetting both myself and the audience.
- A7 If I wish, I can imagine (or daydream) some things so vividly that they hold my attention as a good movie or story does.
- A18 I am able to wander off into my own thoughts while doing a routine task and actually forget that I am doing the task, and then find a few minutes later that I have completed it.
- A14 I can often somehow sense the presence of another person before I actually see or hear her/him.
- A28 I often know what someone is going to say before he or she says it.
- A12 When I listen to music, I can get so caught up in it that I don't notice anything else.
- A24 When listening to organ music or other powerful music, I sometimes feel as if I am being lifted into the air.
- A25 Sometimes I can change noise into music by the way I listen to it.

Appendix B-6. Females and Males in the Criterion Sample:
Communalities for Final Four Factor Solution, 19 Absorption Items.

Variable	Females	Males
<hr/>		
A2	.2501	.3120
A5	.3633	.3918
A6	.5132	.2711
A8	.5226	.5101
A9	.5663	.5243
A10	.4921	.4760
A11	.4805	.5496
A15	.3620	.3770
A17	.4464	.5004
A19	.4296	.3845
A20	.6159	.4076
A22	.4124	.3712
A23	.5409	.5117
A26	.3261	.3491
A27	.4163	.4671
A31	.4511	.3470
A32	.5135	.6092
A33	.5323	.5069
A34	.4385	1.0000

Results for 245 females and 242 males.

Appendix B-7. Females in the Criterion Sample (n=245): Structure Loadings for Final Four Factor Solution, 19 Absorption Items.

Variables	I	II	III	IV
Introspective Absorption				
A19	.351	.645		.338
A20	.446	.774	.464	.413
A22	.351	.594	.495	.399
A32	.303	.697	.410	.478
Reality Absorption				
A2	.485			
A6	.708			.350
A15	.541	.414	.450	.367
A23	.704	.399	.473	
A34	.650	.387	.373	
Synesthesia				
A10	.447	.399	.658	.467
A17	.483	.496	.596	
A26	.393		.515	.394
A27	.423	.401	.620	.357
A33		.358	.722	
Mysticism				
A5	.407	.459	.385	.540
A8	.494	.545	.418	.656
A9	.310	.436	.332	.750
A11	.388	.409	.393	.676
A31		.595	.376	.565

Pattern loadings less than .25 have been omitted.

Appendix B-7 (Continued). Males in the Criterion Sample (n=242):
Structure Loadings for Final Four Factor Solution, 19 Absorption Items.

Variables	I	II	III	IV
Introspective				
Absorption				
A19	.531	.484	.344	.507
A20	.454	.486	.359	.578
A22	.337	.306		.606
A32	.469	.439	.355	.772
Reality				
Absorption				
A2	.383	.396	.459	.437
A6		.330	.483	.335
A15	.449		.547	.429
A23	.449		.510	.660
A34			.990	.330
Synesthesia				
A10	.668	.501	.337	.372
A17	.702	.451	.324	.407
A26	.574			.405
A27	.657	.417	.348	.511
A33	.706	.426		.322
Mysticism				
A5	.400	.612		.377
A8	.453	.710		.328
A9	.376	.717	.319	.354
A11	.602	.684		.368
A31	.408	.574		.355

Structure loadings less than .30 have been omitted.

Appendix B-8. Females and Males in the Criterion Sample: Factor Intercorrelations for Final Four Factor Solution, 19 Absorption Items.

	Synesthesia	Mysticism	Reality Absorption	Introspective Absorption
Synesthesia	----	.556	.386	.548
Mysticism	.410	----	.336	.440
Reality Absorption	.455	.412	----	.452
Introspective Absorption	.484	.513	.456	----

Correlations for males reported above the diagonal; correlations for females reported below the diagonal.

Results for 245 females and 242 males.

Appendix B-9. Females in the Replication Sample (n=140): Means, Standard Deviations, and Coefficients of Skewness for Final 19 Absorption Items, ordered by magnitude of means.

Variable	Mean	Standard Deviation	Skewness	Proposed Factor
A34	3.22	.814	-.82	R
A19	3.04	.821	-.54	I
A20	2.99	.818	-.22	I
A17	2.93	.845	-.29	S
A32	2.87	.767	.03	I
A15	2.87	.864	-.22	R
A22	2.85	.839	-.30	I
A6	2.85	.889	-.13	R
A26	2.73	1.038	-.21	S
A23	2.68	.976	-.11	R
A2	2.66	.828	.23	R ^a
A8	2.37	.868	.13	M
A31	2.16	.916	.30	M
A11	2.14	.902	.19	M
A33	1.98	.971	.60	S
A5	1.84	.780	.64	M
A9	1.76	.755	.51	M
A10	1.73	.912	1.01	S

^aReality Absorption item initially included, but dropped.

*Skewness(critical) = .53, $p < .01$.

R=Reality Absorption; I=Introspective Absorption; M=Mysticism; S=Synesthesia.

Appendix B-9 (Continued). Males in the Replication Sample (n=82): Means, Standard Deviations, and Coefficients of Skewness for Final 19 Absorption Items, ordered by magnitude of means.

Variable	Mean	Standard Deviation	Skewness	Proposed Factor
A20	3.06	.743	-.27	I
A19	3.05	.815	-.22	I
A32	2.98	.816	-.23	I
A34	2.98	.875	-.17	R
A22	2.78	.903	-.06	I
A15	2.68	1.041	-.13	R
A6	2.67	.876	-.30	R
A26	2.57	1.006	.05	S
A17	2.49	.878	.09	S
A23	2.45	1.020	.27	R
A2	2.41	.888	.26	R ^a
A27	2.40	1.121	.16	S
A8	2.17	.886	.61	M
A31	2.05	.955	.41	M
A11	1.95	.784	.54	M
A5	1.90	.780	.48	M
A33	1.78	.861	.89	S
A9	1.76	.869	.82	M
A10	1.63	.910	1.16	S

^a Reality Absorption item initially included, but dropped.

*Skewness (critical) = .70, $p < .01$.

R=Reality Absorption; I=Introspective Absorption; M=Mysticism; S=Synesthesia.

**Appendix B-10. For Females and Males in the Replication Sample:
Squared Multiple Correlations and Communalities for final 19 Absorption
items.**

Variable	Females SMC	Communal.	Males SMC	Communal.
A2	.32358	.2595	.40802	.2625
A5	.39719	.4082	.50812	.4329
A6	.41500	.4428	.34386	.2747
A8	.50475	.5307	.45095	.4302
A9	.38795	.4664	.57862	.6067
A10	.42379	.4789	.44355	.3511
A11	.51307	.4900	.48127	.3464
A15	.51307	.4757	.52526	.6275
A17	.37645	.3635	.41503	.4003
A19	.43846	.4058	.22735	.1574
A20	.38983	.4278	.46410	.8824
A22	.31202	.2891	.45771	.3163
A23	.36925	.3255	.60341	.6066
A26	.37769	.4182	.42008	.4701
A27	.44890	.4917	.48524	.4904
A31	.32584	.3447	.30037	.2604
A32	.27903	.2080	.43482	.2652
A33	.56184	.6310	.47027	.4333
A34	.50597	.7046	.55376	.7234

Results for 140 females and 82 males.

Appendix B-11. Females in the Replication Sample (n=140): Pattern Matrix for Final Four Factor Solution, 19 Absorption Items.

Variables	I	II	III	IV
Introspective Absorption				
A19	.629			
A20	.505		.296	
A22	.463			
A32	.262			
Reality Absorption				
A2		.409		
A6		.610		
A15		.523		
A23	.370			
A34		.856		
Synesthesia				
A10				.627
A17	.421			
A26	.578			
A27				.593
A33				.720
Mysticism				
A5			.579	
A8			.539	
A9			.655	
A11			.568	
A31	.289		.318	

Pattern loadings less than .25 have been omitted.

Appendix B-11 (Continued). Males in the Replication Sample (n=82):
Pattern Matrix for Final Four Factor Solution, 19 Absorption Items.

Variables	I	II	III	IV
Introspective Absorption				
A19				.400
A20				.881
A22	.305		.303	
A32	.356			
Reality Absorption				
A2				
A6		.459		
A15		.678		
A23	.508	.416		
A34		.846	-.254	
Synesthesia				
A10	.368	.339		
A17	.625			
A26	.666			
A27	.655			
A33	.651			
Mysticism				
A5	.380		.476	
A8			.559	
A9	.309		.594	
A11	.456			
A31			.412	

Pattern loadings less than .25 have been omitted.

Appendix B-12. Females in the Replication Sample (n=140): Structure Matrix for Final Four Factor Solution, 19 Absorption Items.

Variables	I	II	III	IV
Introspective Absorption				
A19	.636		.312	
A20	.603		.487	
A22	.524		.330	
A32	.398	.317	.354	
Reality Absorption				
A2	.357	.476		
A6		.634	.366	.306
A15	.327	.644	.387	.436
A23	.484	.418		.353
A34	.387	.835	.310	
Synesthesia				
A10		.305		.676
A17	.542	.360	.345	.377
A26	.599	.301		.374
A27		.403	.311	.671
A33	.361	.358		.776
Mysticism				
A5	.345	.341	.633	
A8	.458	.495	.679	
A9	.335	.322	.680	
A11		.335	.624	.457
A31	.453	.371	.475	

Structure loadings less than .30 have been omitted.

Appendix B-12 (Continued). Males in the Replication Sample (n=82):
Structure Matrix for Final Four Factor Solution, 19 Absorption Items.

Variables	I	II	III	IV
Introspective Absorption				
A19				.395
A20	.359	.359		.927
A22	.444		.438	.300
A32	.449	.361		
Reality Absorption				
A2	.360	.390	.300	.336
A6		.507		
A15		.710	.481	
A23	.670	.614		
A34	.313	.817		
Synesthesia				
A10	.500	.478		
A17	.622			
A26	.663			.301
A27	.686	.350		
A33	.654			
Mysticism				
A5	.484		.558	
A8		.329	.617	
A9	.522	.356	.703	
A11	.540		.395	
A31			.451	.328

Structure loadings less than .30 have been omitted.

Appendix B-13. Females and Males in the Replication Sample: Factor Intercorrelations for Final Four Factor Solution, 19 Absorption Items.

	Synesthesia	Mysticism	Reality Absorption	Introspective Absorption
Synesthesia	---	.329	.369	.243
Mysticism	.244	---	.258	.218
Reality Absorption	.338	.447	---	.283
Introspective Absorption	.261	.448	.435	---

Correlations for males reported above the diagonal; correlations for females reported below the diagonal.

Appendix B-14. Females and Males in the Criterion Sample:
Intercorrelations Among Final Subfactors, Equal Weighting for Each
Absorption Item.

	Synesthesia	Mysticism	Reality Absorption	Introspective Absorption
Synesthesia	----	.589	.500	.578
Mysticism	.580	----	.414	.572
Reality Absorption	.574	.505	----	.549
Introspective Absorption	.560	.649	.549	----

Correlations for males reported above the diagonal; correlations for females reported below the diagonal.

Appendix B-14 (Continued). Females and Males in the Replication Sample:
Intercorrelations Among Final Subfactors, Equal Weighting for Each
Absorption Item.

	Synesthesia	Mysticism	Reality Absorption	Introspective Absorption
Synesthesia	---	.495	.486	.457
Mysticism	.464	---	.460	.439
Reality Absorption	.573	.491	---	.439
Introspective Absorption	.453	.530	.431	---

Correlations for males reported above the diagonal; correlations for females reported below the diagonal.

Appendix B-15. For Females and Males in the Criterion and Replication Sample: Proportion Marginals for Final Subfactors.

		Introspective Absorption	Reality Absorption	Synesthesia	Mysticism
<i>Group</i>					
Criterion Females	p= q=	.739	.665	.633	.776
Criterion Males	p= q=	.775	.523	.675	.760
Replication Females	p= q=	.826	.792	.681	.757
Replication Males	p= q=	.817	.634	.646	.768

Appendix C

Questionnaires included in Hypnosis Session - Study 2

1. Bett's Vividness of Mental Imagery
2. Carleton Hypnosis Attitudes Scales
3. One-item Expectancy Measure

Directions: This Questionnaire involves imagining certain situations. For each of the following questions, please indicate which of the responses in the key below best applies.

- a) perfectly clear, and as vivid as the actual experience
- b) very clear, and comparable in vividness to the actual experience
- c) moderately clear and vivid
- d) not clear or vivid, but recognizable
- e) vague and dim
- f) so vague and dim as to be hardly discernible
- g) no image present at all; you only know that you are thinking of it

In addition, sometimes persons experience their imagining as effortless; their images seem to require no mental work. At other times, a great deal of mental work is required. This questionnaire is also designed to assess the degree to which you experienced your imagining as effortless. Please indicate which of the responses in the key below best applies.

- a) Completely effortless: the image seemed to appear by itself.
- b) Mostly effortless: the image required some mental work.
- c) Moderately effortless: the image required a moderate amount of mental work.
- d) Slightly effortless: the image required a lot of mental work.
- e) My imagining required constant mental work.

Please circle one response for each question.

1. When you close your eyes and try to imagine a specific automobile which you have seen many times, how vividly can you imagine it?

a b c d e f g

How effortlessly did you experience your imagining?

a b c d e

2. When you keep your eyes open and try to imagine the automobile, how vividly can you imagine it?

a b c d e f g

How effortlessly did you experience your imagining?

a b c d e

3. When you close your eyes and try to imagine a color, such as a bright blue, how vividly can you imagine it?

a b c d e f g

How effortlessly did you experience your imagining?

a b c d e

4. When you keep your eyes open and try to imagine a patch of the wall becoming a different color, how vividly can you imagine the changed color?

a b c d e f g

How effortlessly did you experience your imagining?

a b c d e

5. When you close your eyes and try to imagine your name and address written on a paper before you, how vividly can you imagine seeing the words?

a b c d e f g

How effortlessly did you experience your imagining?

a b c d e

6. When you try to imagine hearing a tune, how vividly can you imagine it?

a b c d e f g

How effortlessly did you experience your imagining?

a b c d e

7. When you try to imagine yourself running, how vividly can you imagine yourself actually moving? (This refers to the feeling of your muscles in motion not to visually seeing yourself running.)

a b c d e f g

How effortlessly did you experience your imagining?

a b c d e

8. When you try to imagine your arms as being especially heavy, how vividly can you imagine it?

a b c d e f g

How effortlessly did you experience your imagining?

a b c d e

9. When you try to imagine a common odor, such as a fragrant cup of hot coffee, how vividly can you imagine it?

a b c d e f g

How effortlessly did you experience your imagining?

a b c d e

10. When you try to imagine a common taste, such as the sweetness of sugar, how vividly can you imagine it?

a b c d e f g

How effortlessly did you experience your imagining?

a b c d e

11. When you try to imagine the room as becoming especially warm, how vividly can you imagine it?

a b c d e f g

How effortlessly did you experience your imagining?

a b c d e

12. When you try to imagine the room as becoming especially cold, how vividly can you imagine it?

a b c d e f g

How effortlessly did you experience your imagining?

a b c d e

13. When you imagine yourself stroking fur, how vividly can you imagine the fur? (This refers to the feeling of touching, not visually trying to see it.)

a b c d e f g

How effortlessly did you experience your imagining?

a b c d e

14. When you try to imagine how it feels when you have a stomach ache how vividly can you imagine it?

a b c d e f g

How effortlessly did you experience your imagining?

a b c d e

15. When you try to imagine the room spinning, how vividly can you imagine it?

a b c d e f g

How effortlessly did you experience your imagining?

a b c d e

Instructions: Please indicate your degree of agreement or disagreement with each of the following statements by circling the appropriate number for each statement.

1. I find the whole idea of becoming hypnotized an attractive prospect.

1	2	3	4	5	6	7
Not at all true						Very true

2. I have some apprehensions about hypnosis and being hypnotized.

1	2	3	4	5	6	7
Not at all true						Very true

3. If someone attempted to hypnotize me, I would tend to hold myself back rather than let myself get carried away by the process.

1	2	3	4	5	6	7
Not at all true						Very true

4. I would like to become deeply hypnotized.

1	2	3	4	5	6	7
Not at all true						Very true

5. I wonder about the mental stability of those who become deeply hypnotized.

1	2	3	4	5	6	7
Not at all true						Very true

6. Those who are easily hypnotizable are weak people.

1	2	3	4	5	6	7
Not at all true						Very true

7. Those who can become deeply hypnotized are as normal and well adjusted as anyone.

1	2	3	4	5	6	7
Not at all true						Very true

8. I would not mind being known as someone who can be deeply hypnotized.

1	2	3	4	5	6	7
Not at all true						Very true

9. Intelligent people are the least likely to get hypnotized.

1	2	3	4	5	6	7
Not at all true						Very true

10. I'm not afraid of becoming hypnotized.

1	2	3	4	5	6	7
Not at all true						Very true

11. I am wary about becoming hypnotized because it means giving up my free will to the hypnotist.

1	2	3	4	5	6	7
Not at all true						Very true

12. I am totally open to being hypnotized.

1	2	3	4	5	6	7
Not at all true						Very true

13. One's ability to be hypnotized is a sign of their creativity and inner strength.

1	2	3	4	5	6	7
Not at all true						Very true

14. A deeply hypnotized person is robot-like and goes along automatically with whatever the hypnotist suggests.

1	2	3	4	5	6	7
Not at all true						Very true

Appendix D

Carleton University Responsiveness to Suggestion Scale Test Suggestions (In order of presentation)

1. Arm Rising
2. Arms Moving Apart
3. Arm Rigidity
4. Arm Heaviness
5. Experiencing Music
6. Experiencing a Kitten
7. Hypnotic Amnesia

Appendix E

Study 2 - Additional Results

Appendix E-1. Coefficients of Skewness for Absorption and Susceptibility Measures, Broken Down by Condition and Gender.

Variable	Females	Males
<u>Prior to Hypnosis Condition</u>		
CURSS:O	.435	.788
CURSS:S	.210	1.023 ^a
CURSS:OI	1.236	1.665
Mass Testing Absorption	.381 ^b	.269
Hypnosis Session Absorption	-.032	.254
<u>After Hypnosis Condition</u>		
CURSS:O	.499	.692
CURSS:S	.487	.176
CURSS:OI	2.114	1.591
Mass Testing Absorption	-.136	-.051
Hypnosis Session Absorption	-.169	-.088

^aCoefficient of Skewness after outlier adjustment = .764.

^b_{n=49.}

For $n=50$, Critical Coefficient of Skewness $(.01) = .89$.

Appendix E-2. Gender and Condition Main Effect MANOVA Results with the Three Susceptibility Measures as Dependent Variables.

MANOVA Analysis	Standardized Coefficients	Structure Coefficients	Univariate F-Values
<u>Condition Main Effect</u>			
CURSS:O	.144	-.702	3.86, p = .051
CURSS:S	-1.058	-.995	7.76, p = .006
CURSS:OI	-.064	-.748	4.37, p = .038
<u>Gender Main Effect</u>			
CURSS:O	.371	-.580	3.27, p = .072
CURSS:S	-1.266	-.970	9.13, p = .003
CURSS:OI	-.019	-.672	4.38, p = .038

Appendix E-3. Intercorrelations Among Susceptibility Measures, Broken Down by Condition and Gender.

Prior to Hypnosis Condition	CURSS:O	CURSS:S	CURSS:OI
CURSS:O	---	.75	.66
CURSS:S	.80	---	.76
CURSS:OI	.65	.78	---

Female values above the diagonal; Male values below the diagonal.

After Hypnosis Condition	CURSS:O	CURSS:S	CURSS:OI
CURSS:O	---	.79	.72
CURSS:S	.71	---	.73
CURSS:OI	.47	.60	---

Female values above the diagonal; Male values below the diagonal.

**PM-1 3½"x4" PHOTOGRAPHIC MICROCOPY TARGET
NBS 1010a ANSI/ISO #2 EQUIVALENT**

Appendix E-4. Source Table for Split-Plot Factorial ANOVA with Two Between Subject Variables (Condition; Gender) and One Within Subject Variable (Context), Absorption as the Dependent Variable.

Source	df	MS	F-ratio
Condition	1	713.532	1.31
Gender	1	1246.158	2.30
Condition X Gender	1	143.784	< 1
Error	194	543.052	
Context	1	2865.312	45.7**
Condition X Context	1	291.152	4.64*
Gender X Context	1	13.544	< 1
Condition X Gender X Context	1	485.667	7.75**
Error	194	62.698	

Results for 100 males and 98 females (one female missing from each condition).

* $p < .05$

** $p < .01$

Appendix E-5. Summary of Hierarchical Regression Analyses: Testing Context Dependency Hypothesis for Absorption Scale for For Females and Males Separately.

Entry Level	IV Entered	CURSS:O		CURSS:S		CURSS:OI	
		t	p	t	p	t	p

Females

1.	ABS	1.18	.24	2.04	.04	1.13	.26
2.	Context	1.96	.05	2.92	.004	2.11	.04
3.	ABS X Context	.82	.41	.38	.71	.47	.64
Overall		$R^2=.06$		$R^2=.12^{**}$		$R^2=.06$	

Males

1.	ABS	1.94	.06	2.72	.01	2.21	.03
2.	Context	1.73	.09	2.41	.02	1.77	.08
3.	ABS X Context	.52	.94	1.13	.26	1.57	.12
Overall		$R^2=.07$		$R^2=.13^{**}$		$R^2=.10^*$	

* $p < .05$

** $p < .01$

Note t-values reported for ABS and Context do not represent a test of the unique variance shared by these variables and the dependent variable for the interactive model. All t-values in the table represent a test of the contribution of a variable, with all other variable entered previously into the equation controlled. For the interactive model, only t-values associated with ABS X Context represent a test of the unique variance shared with a particular dependent variable.

Appendix E-6. Regressed Change Analysis with Within-Context
Absorption Scores as the Dependent Variable (Collapsing Across Gender).

	$R^2_{(\text{change})}^a$	$R^2_{(\text{regressed change})}$	t	p
<u>Variable Entered</u>				
<u>Prior to Hypnosis Condition</u>				
<i>Step 1, Entered:</i>				
Test/Retest (Out-of-Context ABS)	.585		11.69	.000
<i>Step 2, Stepwise Regression Entered: ^b</i>				
CURSS:S	.029	.069	2.68	.008
<i>Step 3 (none entered- CURSS:O, ns)</i>				
<u>After Hypnosis Condition</u>				
<i>Step 1, Entered:</i>				
Test/Retest (Out-of-Context ABS)	.658		13.66	.000
<i>Step 2, Entered: ^c</i>				
CURSS:S	.013	.037	1.92	.057

^aFor CURSS:S scores entered at Step 2, values reported represent unique total variance accounted for in Within-Context Absorption scores.

^bHad CURSS:S not been included in the stepwise regression, CURSS:O would have been entered at Step 2 [$t_{(96)}=2.17$, $p=.03$] and would have accounted for 4.6% of the variance in regressed change.

^cStepwise regression analysis failed to enter either CURSS:O or CURSS:S. To review results for the trend suggested, CURSS:S was forced at Step 2.

Appendix E-7. For All Subjects in Study 2: Scatterplot of Mass Testing Absorption Scores with CURSS:0.

CURSS:0

Mass Testing Absorption

Appendix E-7 (Continued). For All Subjects in Study 2: Scatterplot of
Mass Testing Absorption Scores with CURSS:S.

CURSS:S

Mass Testing Absorption

Appendix E-7 (Continued). For All Subjects in Study 2: Scatterplot of Hypnosis Session Absorption Scores with CURSS:0.

Hypnosis Session Absorption

120 cases plotted.

Appendix E-7 (Continued). For All Subjects in Study 2: Scatterplot of Hypnosis Session Absorption Scores with CURSS:S.

100 cases omitted.

Appendix E-8. Source Table for Condition X Gender ANOVA with Attitude Scores as the Dependent Variable.

Source	df	MS	F-ratio
Condition	1	17.886	< 1
Gender	1	13.368	< 1
Condition X Gender	1	7.043	< 1
Error	193	149.264	

Due to missing values on Attitude scale, n=49 for each group, except After Hypnosis Females (n=50).

Appendix E-9. Total Attitude Correlations with Susceptibility Measures,
Broken Down by Condition and Gender.

Attitude Scores with:	CURSS:O	CURSS:S	Mass Testing Absorption
<u>Prior to Hypnosis Condition</u>			
Females (n=49)	.37*	.27	.23
Males (n=49)	.11	.14	.08
<u>After Hypnosis Condition</u>			
Females (n=50)	.20	.22	.12
Males (n=49)	.22	.17	-.05

* $p < .05$

** $p < .01$

Appendix E-10. Females and Males in the *Prior to Hypnosis Condition*:
 Test of the Joint Relationship between Attitudes and Mass Testing
 Absorption, with CURSS:O as the Dependent Variable.

Criterion Variable: CURSS:O

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
<u>Females (n=48)</u>								
Attitudes	.347	2.44	.02	.11	1.940	2.25	.03	
Absorption	.082	.59	.57	.01	1.743	1.94	.06	
Attitudes X Absorption					-2.566	-1.87	.07	.06
Overall				$R^2=.14^*$				$R^2=.20^*$
<u>Males (n=49)</u>								
Attitudes	.100	.68	.50	.01	-.232	-.33		
Absorption	.100	.68	.50	.01	-.406	-.38		
Attitudes X Absorption					.631	.48	.63	.01
Overall				$R^2=.02$				$R^2=.03$

All values reported subject to rounding error.

For R^2 Values:

* $p < .05$

** $p < .01$

Appendix E-10 (Continued). Females and Males in the *Prior to Hypnosis Condition*: Test of the Joint Relationship between Attitudes and Mass Testing Absorption, with CURSS:S as the Dependent Variable.

Criterion Variable: CURSS:S

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
Females (n=48)								
Attitudes	.245	1.68	.10	.06	1.875	2.12	.04	
Absorption	.131	.90	.37	.02	1.831	1.99	.05	
Attitudes X Absorption					-2.626	-1.87	.07	.07
<i>Overall</i>				$\overline{R^2}=.09$				$\overline{R^2}=.16^*$
Males (n=49)								
Attitudes	.121	.84	.40	.01	-1.006	-1.48	.15	
Absorption	.164	1.14	.26	.03	-1.554	-1.52	.14	
Attitudes X Absorption					2.148	1.69	.10	.05
<i>Overall</i>				$\overline{R^2}=.05$				$\overline{R^2}=.10^a$

All values reported subject to rounding error.

For R^2 Values:

* $p < .05$

** $p < .01$

^a $p=.18$.

Appendix E-10 (Continued). Females and Males in the *After Hypnosis Condition*: Test of the Joint Relationship between Attitudes and Mass Testing Absorption, with CURSS:O as the Dependent Variable.

Criterion Variable: CURSS:O

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
Females (n=50)								
Attitudes	.186	1.30	.20	.03	.489	.85	.40	
Absorption	.096	.67	.51	.01	.446	.67	.50	
Attitudes X Absorption					-.496	-.54	.59	.00
<i>Overall</i>				$\overline{R^2}=.05$				$\overline{R^2}=.05$
Males (n=49)								
Attitudes	.234	1.67	.10	.05	.186	.24	.82	
Absorption	.230	1.65	.11	.05	.183	.23	.82	
Attitudes X Absorption					.066	.06	.95	.00
<i>Overall</i>				$\overline{R^2}=.10$				$\overline{R^2}=.10$

All values reported subject to rounding error.

For R^2 Values:

* $p < .05$

** $p < .01$

Appendix E-10 (Continued). Females and Males in the *After Hypnosis Condition*: Test of the Joint Relationship between Attitudes and Mass Testing Absorption, with CURSS:S as the Dependent Variable.

Criterion Variable: CURSS:S

Predictor	Additive Model				Interactive Model			
	B	t	p	R ² _(unique)	B	t	p	R ² _(unique)
Females (n=50)								
Attitudes	.187	1.35	.19	.03	.679	1.22		
Absorption	.243	1.75	.09	.06	.812	1.27		
Attitudes X Absorption					-.805	-.91	.37	.01
Overall				$\overline{R^2} = .11$				$\overline{R^2} = .12$
Males (n=49)								
Attitudes	.188	1.36	.18	.03	.006	.01	.99	
Absorption	.303	2.19	.03	.09	.123	.16	.87	
Attitudes X Absorption					.251	.22	.82	.00
Overall				$\overline{R^2} = .12^*$				$\overline{R^2} = .12$

All values reported subject to rounding error.

For R² Values:

*p < .05

**p < .01

Appendix E-11. For Females in the Prior to Hypnosis Condition: Item Difficulty for CURSS Suggestions and Correlations for Absorption and Test Suggestions.

Test Suggestions	Item Difficulty	CURSS:O		CURSS:S
		r_{pb}	r_b	r
Arms Apart	.64	.071	.091	.036
Arm Rigidity	.48	.045	.056	.281
Arm Heaviness	.46	.355	.444	.439
Arm Rising	.30	.215	.283	-.033
Music Hallucination	.32	.071	.093	.089
Kitten Hallucination	.30	.080	.105	.191
Amnesia	.30	.021	.028	.207

Appendix E-11 (Continued). For Males in the Prior to Hypnosis Condition:
Item Difficulty for CURSS Suggestions and Correlations for Absorption
and Test Suggestions.

Test Suggestions	Item Difficulty	CURSS:O		CURSS:S
		r_{pb}	r_b	r
Arms Apart	.58	.222	.280	.376
Arm Rigidity	.48	.095	.119	.261
Arm Heaviness	.46	.066	.083	.237
Arm Rising	.22	.195	.272	.225
Music Hallucination	.24	.091	.125	.240
Kitten Hallucination	.14	.171	.266	.468
Amnesia	.10	.360	.615	-.011

Appendix E-11 (Continued). For Females in the After Hypnosis Condition:
Item Difficulty for CURSS Suggestions and Correlations for Absorption
and Test Suggestions.

Test Suggestions	Item Difficulty	CURSS:O		CURSS:S r
		r_{pb}	r_b	
Arms Apart	.42	.029	.037	.323
Arm Rigidity	.42	.172	.217	.169
Arm Heaviness	.44	.097	.121	.326
Arm Rising	.36	.138	.177	.145
Music Hallucination	.22	.129	.180	.219
Kitten Hallucination	.08	-.010	-.018	.148
Amnesia	.24	-.019	-.025	-.063

Appendix E-11 (Continued). For Males in the After Hypnosis Condition:
Item Difficulty for CURSS Suggestions and Correlations for Absorption
and Test Suggestions.

Test Suggestions	Item Difficulty	CURSS:O		CURSS:S
		r_{pb}	r_b	r
Arms Apart	.58	.113	.143	.148
Arm Rigidity	.34	.187	.242	.273
Arm Heaviness	.32	.183	.239	.260
Arm Rising	.30	.150	.197	.334
Music Hallucination	.18	.094	.137	.207
Kitten Hallucination	.06	.202	.407	.040
Amnesia	.06	.130	.260	.143

Appendix E-12. Joint Relationship of Condition X Expectancy with CURSS:O as the Criterion Variable (Collapsed Across Gender).

Criterion Variable: CURSS:O

<u>Predictor</u>	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
<hr/>								
<u>All Subjects</u> (n=195)								
Condition	.114	1.64	.10	.01	-.246	-1.36	.17	
Expectancy	.238	3.40	.00	.06	.241	3.48	.00	
Condition X Expectancy					.390	2.16	.03	.02
<i>Overall</i>	$\overline{R^2} = .08^*$				$\overline{R^2} = .10^*$			

All *t*-values are statistically significant at reported *p*-values.

For R^2 values:

**p* < .05

***p* < .01

Appendix E-12. Joint Relationship of Condition X Expectancy with CURSS:S as the Criterion Variable (Collapsed Across Gender).

Criterion Variable: CURSS:S

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{\text{(unique)}}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{\text{(unique)}}$
<u>All Subjects</u>								
(n=195)								
Condition	.149	2.17	.03	.02	-.183	-1.04	.30	
Expectancy	.272	3.96	.00	.07	.275	4.04	.00	
Condition X Expectancy					.361	2.03	.04	.02
<i>Overall</i>				$\overline{R^2} = .10^{**}$				$\overline{R^2} = .12^{**}$

All values reported subject to rounding error.

For R^2 values:

* $p < .05$

** $p < .01$

Appendix F

Adjectives Proposed for Interpersonal Orientation Subscales

Interpersonal Sensitivity

Cheerful
Affectionate
Sympathetic
Sensitive to needs of others
Understanding
Compassionate
Eager to soothe hurt feelings
Warm
Tender
Loves children
Gentle

Assertiveness

Aggressive
Acts as leader
Forceful
Dominant
Has leadership abilities
Ambitious
Competitive
Assertive
Strong personality
Makes decisions easily

Self-Reliant

Self-reliant
Independent
Self-sufficient
Defends own beliefs
Willing to take risks
Willing to take a stand
Individualistic

Appendix G

Bem Sex-Role Inventory

Self-Description Questionnaire

Instructions: Indicate on a scale of 1-7 how well each of the following characteristics describes you using the following scale:

- 1 = never or almost never true
- 2 = usually not true
- 3 = sometimes but infrequently true
- 4 = occasionally true
- 5 = often true
- 6 = usually true
- 7 = always or almost always true

-
_____ 1. self-reliant	_____ 22. analytical
_____ 2. yielding	_____ 23. sympathetic
_____ 3. helpful	_____ 24. jealous
_____ 4. defends own beliefs	_____ 25. has leadership abilities
_____ 5. cheerful	_____ 26. sensitive to the needs of others
_____ 6. moody	_____ 27. truthful
_____ 7. independent	_____ 28. willing to take risks
_____ 8. shy	_____ 29. understanding
_____ 9. conscientious	_____ 30. secretive
_____ 10. athletic	_____ 31. makes decisions easily
_____ 11. affectionate	_____ 32. compassionate
_____ 12. theatrical	_____ 33. sincere
_____ 13. assertive	_____ 34. self-sufficient
_____ 14. flatterable	_____ 35. eager to soothe hurt feelings
_____ 15. happy	_____ 36. conceited
_____ 16. strong personality	_____ 37. dominant
_____ 17. loyal	_____ 38. soft spoken
_____ 18. unpredictable	_____ 39. likable
_____ 19. forceful	_____ 40. masculine
_____ 20. feminine	_____ 41. warm
_____ 21. reliable	_____ 42. solemn

1 = never or almost never true
2 = usually not true
3 = sometimes but infrequently true
4 = occasionally true
5 = often true
6 = usually true
7 = always or almost always true

_____ 43. willing to take a stand	_____ 52. does not use harsh language
_____ 44. tender	_____ 53. individualistic
_____ 45. friendly	_____ 54. unsystematic
_____ 46. aggressive	_____ 55. competitive
_____ 47. gullible	_____ 56. loves children
_____ 48. inefficient	_____ 57. tactful
_____ 49. acts as a leader	_____ 58. ambitious
_____ 50. childlike	_____ 59. gentle
_____ 51. adaptable	_____ 60. conventional

Appendix H

Experience Survey: Cover Page

Experience Survey

NAME: _____

This package contains several questionnaires from different areas of research. Your participation is voluntary and your responses will be entirely confidential. There are no right or wrong answers, so your honesty will be greatly appreciated.

If you have questions regarding the outcome of this research, please contact M. de Groh, Room A814 Loeb, at the end of the school year.

I understand that my participation is entirely voluntary

Participant: _____

(please sign before completing this survey)

Appendix I

Interpersonal Reactivity Index
Scale ItemsEmpathic Concern Scale

1. I often have tender, concerned feelings for people less fortunate than me.
2. Sometimes I don't feel very sorry for other people when they are having problems. (scoring reversed)
3. When I see someone being taken advantage of, I feel kind of protective towards them.
4. Other people's misfortunes do not usually disturb me a great deal. (scoring reversed)
5. When I see someone being treated unfairly, I sometimes don't feel very much pity for them. (scoring reversed)
6. I am often quite touched by things that I see happen.
7. I would describe myself as a pretty soft-hearted person.

Perspective-Taking

1. I sometimes find it difficult to see things from the "other person's" point of view. (scoring reversed)
2. I try to look at everybody's side of a disagreement before I make a decision.
3. I sometimes try to understand my friends better by imagining how things look from their perspective.

4. If I'm sure I'm right about something, I don't waste much time listening to other people's arguments. (scoring reversed)
5. I believe that there are two sides to every question and try to look at them both.
6. Before criticising somebody, I try to imagine how I would feel if I were in their place.
7. When I'm upset at someone, I usually try to "put myself in their shoes" for a while.

Fantasy

1. I daydream and fantasize, with some regularity, about things that might happen to me.
2. I really get involved with the feelings of the characters in a novel.
3. I am usually objective when I watch a movie or play, and I don't often get completely caught up in it. (scoring reversed)
4. Becoming extremely involved in a good book or movie is somewhat rare for me. (scoring reversed)
5. After seeing a play or movie, I have felt as though I were one of the characters.
6. When I watch a good movie, I can very easily put myself in the place of a leading character.
7. When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me.

Personal Distress

1. In emergency situations, I feel apprehensive and ill-at-ease.
2. I sometimes feel helpless when I am in the middle of a very emotional

situation.

3. Being in a tense emotional situation scares me.
4. I am usually pretty effective in dealing with emergencies. (scoring reversed)
5. I tend to lose control during emergencies.
6. When I see someone who badly needs help in an emergency, I go to pieces.
7. When I see someone get hurt, I tend to remain calm. (scoring reversed)

Appendix J

Interpersonal Reactivity Index Scale Format Presented to Subjects

The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you by choosing the appropriate number on the scale at the top of the page: 0, 1, 2, 3, or 4. When you have decided on your answer, fill in the number on the answer sheet as honestly and as accurately as you can. Thank you.

Answer Scale:

0	1	2	3	4
Does <u>Not</u> Describe Me Well				Describes Me Very Well

- _____ I daydream and fantasize, with some regularity, about things that might happen to me.
- _____ I often have tender, concerned feelings for people less fortunate than me.
- _____ I sometimes find it difficult to see things from the "other person's" point of view.
- _____ Sometime I don't feel very sorry for other people when they are having problems.
- _____ I really get involved with the feelings of the characters in a novel.
- _____ In emergency situations, I feel apprehensive and ill-at-ease.
- _____ I am usually objective when I watch a movie or play, and I don't often get completely caught up in it.
- _____ I try to look at everybody's side of a disagreement before I make a decision.
- _____ When I see someone being taken advantage of, I feel kind of protective towards them.
- _____ I sometimes feel helpless when I am in the middle of a very emotional situation.

0
Does Not
Describe
Me Well

1

2

3

4

Describes
Me Very
Well

_____ I sometimes try to understand my friends better by imagining how things look from their perspective.

_____ Becoming extremely involved in a good book or movie is somewhat rare for me.

_____ When I see someone get hurt, I tend to remain calm.

_____ Other people's misfortunes do not usually disturb me a great deal.

_____ If I'm sure I'm right about something, I don't waste much time listening to other people's arguments.

_____ After seeing a play or movie, I have felt as though I were one of the characters.

_____ Being in a tense emotional situation scares me.

_____ When I see someone being treated unfairly, I sometimes don't feel very much pity for them.

_____ I am usually pretty effective in dealing with emergencies.

_____ I am often quite touched by things that I see happen.

_____ I believe that there are two sides to every question and try to look at them both.

_____ I would describe myself as a pretty soft-hearted person.

_____ When I watch a good movie, I can very easily put myself in the place of a leading character.

_____ I tend to lose control during emergencies.

0	1	2	3	4
Does <u>Not</u> Describe Me Well				Describes Me Very Well

- _____ When I'm upset at someone, I usually try to "put myself in their shoes" for a while.
- _____ When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me.
- _____ When I see someone who badly needs help in an emergency, I go to pieces.
- _____ Before criticising somebody, I try to imagine how I would feel if I were in their place.

Appendix K

Denial-Avoidance Items

1. I seldom get deeply involved in the problems and experiences of others.
2. I have the ability to view a situation objectively and not get emotionally involved.
3. It seldom bothered me when my parents worried about thing such as money.
4. I have the ability to see an animal hurt without being too disturbed.
5. I am not more sensitive than the normal person about other people's deep feelings.
6. When I see strangers, I almost never try to imagine what they are thinking.
7. I feel other people ought to take care of their own problems themselves.
8. One should not get too involved in other people's problems.
9. I must admit that there have been times I have not been bothered to see a person get injured.

Appendix L

Empathy Scale-Short Form
(Extended to include all Denial-Avoidance items)

The following statements inquire about your thoughts and feelings in a variety of situations. As with the other questionnaires in this package, there are no right or wrong answers, so please be as honest and as accurate as you can. Thank you.

- 1 Strongly Disagree
- 2 Disagree
- 3 Not Sure
- 4 Agree
- 5 Strongly Agree

- _____ I seldom get deeply involved in the problems and experiences of others.
- _____ Sometimes I'm not at all pleased when I hear about a person who gets top grades.
- _____ I have the ability to view a situation objectively and not get emotionally involved.
- _____ Even when I argue with a person, I try to imagine how they feel about their views.
- _____ When someone wins money on a TV show, I often imagine how I would feel if I were that person.
- _____ It seldom bothered me when my parents worried about thing such as money.
- _____ If my friends get poor grades, that's their problem.
- _____ I have the ability to see an animal hurt without being too disturbed.
- _____ When I watch a movie, I often imagine how I would feel if I were that person.
- _____ I am not more sensitive than the normal person about other people's deep feelings.
- _____ When I see strangers, I almost never try to imagine what they are thinking.

- 1 Strongly Disagree
- 2 Disagree
- 3 Not Sure
- 4 Agree
- 5 Strongly Agree

_____ I feel other people ought to take care of their own problems themselves.

_____ When a friend becomes engaged or gets married, I am very happy.

_____ One should not get too involved in other people's problems.

_____ When I disagree with a person, I do not try to feel in my own mind the reason why the person holds an opinion different from mine.

_____ I must admit that there have been times I have not been bothered to see a person get injured.

_____ When I am reading an interesting story, I imagine how I would feel if I were in the same situation as the people in the story.

_____ When I see a very old person, I often wonder how I would feel if I were them.

Appendix M

Self-Consciousness Scale
Subscale ItemsPrivate Self-Consciousness

I'm always trying to figure myself out.

Generally, I'm not very aware of myself.

I reflect about myself a lot.

I'm often the subject of my own fantasies.

I never scrutinize myself.

I'm generally attentive to my inner feelings.

I'm constantly examining my motives.

I sometimes have the feeling that I'm off somewhere watching myself.

I'm alert to changes in my mood.

I'm aware of the way my mind works when I work through a problem.

Public Self-Consciousness

I'm concerned about my style of doing things.

I'm concerned about the way I present myself.

I'm self-conscious about the way I look.

I usually worry about making a good impression.

One of the last things I do before I leave my house is look in the mirror.

I'm concerned about what other people think of me.

I'm usually aware of my appearance.

Social Anxiety

It takes me time to overcome my shyness in new situations.

I have trouble working when someone is watching me.

I get embarrassed very easily.

I don't find it hard to talk to strangers.

I feel anxious when I speak in front of a group.

Large groups make me nervous.

Appendix N

Self-Consciousness Scale

Self-Perceptions Scale

Please indicate the extent to which each of the following statements is descriptive of yourself. Do so by using the scale below, such that the higher the rating you choose, the more characteristic of you the statement is. Indicate your self-ratings by circling the most appropriate number to the right of each statement.

	0	1	2	3	4
	Extremely Uncharacteristic				Extremely Characteristic
1. I'm always trying to figure myself out.	0	1	2	3	4
2. I'm concerned about my style of doing things.	0	1	2	3	4
3. Generally, I'm not very aware of myself.	0	1	2	3	4
4. It takes me time to overcome my shyness in new situations.	0	1	2	3	4
5. I reflect about myself a lot.	0	1	2	3	4
6. I'm concerned about the way I present myself.	0	1	2	3	4
7. I'm often the subject of my own fantasies.	0	1	2	3	4
8. I have trouble working when someone is watching me.	0	1	2	3	4
9. I never scrutinize myself.	0	1	2	3	4
10. I get embarrassed very easily.	0	1	2	3	4
11. I'm self-conscious about the way I look.	0	1	2	3	4
12. I don't find it hard to talk to strangers.	0	1	2	3	4
13. I'm generally attentive to my inner feelings.	0	1	2	3	4
14. I usually worry about making a good impression.	0	1	2	3	4

	0	1	2	3	4
	Extremely
Uncharacteristic			Extremely
Characteristic	
15. I'm constantly examining my motives.	0	1	2	3	4
16. I feel anxious when I speak in front of a group.	0	1	2	3	4
17. One of the last things I do before I leave my house is
look in the mirror.	0	1	2	3	4
18. I sometimes have the feeling that I'm off somewhere
watching myself.	0	1	2	3	4
19. I'm concerned about what other people think of me.	0	1	2	3	4
20. I'm alert to changes in my mood.	0	1	2	3	4
21. I'm usually aware of my appearance.	0	1	2	3	4
22. I'm aware of the way my mind works when I work
through a problem.	0	1	2	3	4
23. Large groups make me nervous.	0	1	2	3	4

Appendix O

Rosenberg's Self-Esteem Scale

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

- 1 Almost Never
- 2 Sometimes
- 3 Often
- 4 Almost Always

- _____ I feel pleasant.
- _____ I tire quickly.
- _____ I feel like crying.
- _____ I wish I could be as happy as others seem to be.
- _____ I am losing out on things because I can't make up my mind soon enough.
- _____ I feel rested.
- _____ I am "calm, cool, and collected".
- _____ I feel that difficulties are piling up so that I cannot overcome them.
- _____ I worry too much over something that really doesn't matter.
- _____ I am happy.
- _____ I am inclined to take things hard.
- _____ I lack self confidence.
- _____ I feel secure.
- _____ I try to avoid facing a crisis or difficulty.
- _____ I feel blue.
- _____ I am content.
- _____ Some unimportant thought runs through my mind and bothers me.
- _____ I am a steady person.
- _____ I take disappointments so keenly that I can't put them out of my mind.
- _____ I get in a state of tension or turmoil as I think over my recent concerns and interests.

Self-Actualization Scale: Positively and Negatively Scored Items

Positively Scored Items

- I do not feel ashamed of any of my emotions.
- I believe that people are essentially good and can't be trusted.
- I feel free to be angry at those I love.
- I can like people without having to approve of them.
- It is better to be yourself than to be popular.
- I can express my feelings even when they may result in undesirable consequences.
- I am loved because I give love.

Negatively Scored Items

- I feel I must do what others expect me to do.
- It is always necessary that others approve of what I do.
- I don't accept my own weaknesses.
- I fear failure.
- I avoid attempts to analyse and simplify complex domains.
- I have no mission in life to which I feel especially dedicated.
- I do not feel responsible to help anybody.
- I am bothered by fears of being inadequate.

Appendix Q

Self-Actualization Scale

Please answer the questions on this page using the scoring system presented below. Remember, there are no right or wrong answers, so please be honest.

- 1 Agree
- 2 Somewhat Agree
- 3 Somewhat Disagree
- 4 Disagree

- _____ I do not feel ashamed of any of my emotions.
- _____ I feel I must do what others expect me to do.
- _____ I believe that people are essentially good and can be trusted.
- _____ I feel free to be angry at those I love.
- _____ It is always necessary that others approve of what I do.
- _____ I don't accept my own weaknesses.
- _____ I can like people without having to approve of them.
- _____ I fear failure.
- _____ I avoid attempts to analyze and simplify complex domains.
- _____ It is better to be yourself than to be popular.
- _____ I have no mission in life to which I feel especially dedicated.
- _____ I can express my feelings even when they may result in undesirable consequences.
- _____ I do not feel responsible to help anybody.
- _____ I am bothered by fears of being inadequate.
- _____ I am loved because I give love.

Appendix R

Study 3 - Additional Results

Appendix R-1. For Females and Males in Survey Sample: Coefficients of Skewness (before and after outlier adjustments) for All Variables Included in Study 3.

Variables	Females (n=103)		Males (n=101)	
	Skew	Skew after Outlier Adj.	Skew	Skew after Outlier Adj.
Absorption	.264		.081	
Interpersonal Sensitivity	-.679	-.458	-.313	
Self-Reliant	-.569	-.28	-.354	
Assertiveness	-.227		-.405	
Empathy	-.432	-.098	-.562	-.382
Perspective- Taking	-.411		-.254	
Davis' Fantasy	.111		-.132	
Personal Distress	.102		.268	
Denial-Avoidance	.137		.021	
Self-Esteem	-.605		-.718	-.659
Self-Actualization	.189		.052	
Private Self-Consciousness	.060		.297	
Public Self-Consciousness	-.569	-.470	-.366	
Social Anxiety	-.520		-.223	
Females, Skewness _(.01) =.62. Males, Skewness _(.01) =.63.				

Appendix R-2. Gender Differences Survey Sample: Hotelling's T^2 Results with BSRI Revised Subscales as Dependent Variables.

T^2 Analysis	Standardized Coefficients	Structure Coefficients	Univariate F-Values
Interpersonal Sensitivity	-.678	-.549	9.01**
Self- Reliant	-.247	.117	.52
Assertive	.966	.679	13.78**

Analysis includes 103 females and 101 males.

Appendix R-3. For Females and Males in Comparison Sample: Coefficients of Skewness (before and after outlier adjustments) for BSRI-Revised Subscales and Absorption

<u>Variables</u>	Females (n=153)		Males (n=152)	
	Skew	Skew after Outlier Adj.	Skew	Skew after Outlier Adj.
Absorption	-.18		-.13	
Interpersonal Sensitivity	-.30	-.25	-.78	-.55
Self-Reliant	-.70		-.69	-.56
Assertiveness	-.39		-.15	

For females and males, Skewness_(.01) = .51.

Appendix R-4. Gender Differences Comparison Sample: Hotelling's T^2 Results with BSRI Revised Subscales as Dependent Variables.

T^2 Analysis	Standardized Coefficients	Structure Coefficients	Univariate F-Values
Interpersonal Sensitivity	-.927	-.105	23.46**
Self- Reliant	-.203	-.038	< 1
Assertive	.486	.049	1.83

Analysis includes 153 females and 152 males.

Appendix R-5. For Survey Sample: Tests of the Joint Relationship of Interpersonal Sensitivity and Self-Reliant Measures to the Criterion Variable: Absorption.

Self-Reliant as Self-Oriented Measure

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
<u>Females</u>								
Interpersonal Sensitivity	.134	1.27	.21	.01	-.157	-.29	.77	
Self-Reliant	.084	.80	.43	.006	-.283	-.42	.68	
I X S					.548	.55	.58	.00
<i>Overall</i>				$\overline{R^2}=.033$				$\overline{R^2}=.036$

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
<u>Males</u>								
Interpersonal Sensitivity	.328	3.59	.001	.10	.510	.81	.42	
Self-Reliant	.278	3.04	.003	.07	.455	.74	.46	
I X S					-.284	-.29	.77	.00
<i>Overall</i>				$\overline{R^2}=.23^{**}$				$\overline{R^2}=.23^{**}$

All *t*-values are statistically significant at reported *p*-values.

* *p* < .05

** *p* < .01

Appendix R-6. For Females and Males in Comparison Sample: Tests of the Joint Relationship of Interpersonal Sensitivity and Self-Reliant to the Criterion Variable: Absorption.

Self-Reliant as Self-Oriented Measure

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
<u>Females</u>								
Interpersonal Sensitivity	.153	1.86	>.05	.02	-1.855	3.11	<.01	
Self-Reliant	.169	2.06	<.05	.03	-1.711	3.06	<.01	
I X S					3.122	3.40	<.01	.06
<i>Overall</i>				$R^2=.07^*$				$R^2=.13^{*a}$

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
<u>Males</u>								
Interpersonal Sensitivity	.391	5.15	<.05	.15	.112	.25		
Self-Reliant	.073	.96	>.05	.01	.148	.42		
I X S					.391	.64	>.10	.00
<i>Overall</i>				$R^2=.17^{**}$				$R^2=.17^{**}$

All *t*-values are statistically significant at reported *p*-values.

**p* < .05

***p* < .01

^aRegression Equation for interactive model $y' = 306.66 - 4.168(I) - 6.145(S) + .1129(I \times S)$

Appendix R-7. For Survey Sample: Tests of the Joint Relationship of Interpersonal Sensitivity and Asseriveness Measures to the Criterion Variable: Absorption.

Assertive as Self-Oriented Measure

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
<u>Females</u>								
Interpersonal Sensitivity	.143	1.41	.16	.02	-.502	-1.21	.23	
Assertive	.085	.84	.40	.01	-1.117	-1.48	.14	
I X A					1.503	1.61	.11	.03
Overall				$\overline{R^2} = .03$				$\overline{R^2} = .06$

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
<u>Males</u>								
Interpersonal Sensitivity	.387	4.11	.00	.14	.351	.64	.53	
Assertive	.043	.46	.65	.00	.003	.01	.99	
I X A					.059	.07	.95	.00
Overall				$\overline{R^2} = .16^{**}$				$\overline{R^2} = .16^{**}$

All t-values are statistically significant at reported p-values.

* $p < .05$

** $p < .01$

Appendix R-8. For Females, Males and "All Subjects" in Comparison
Sample: Tests of the Joint Relationship of Interpersonal Sensitivity and
Assertiveness to the Criterion Variable: Absorption.

Assertive as Self-Oriented Measure

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
<u>Females</u>								
Interpersonal Sensitivity	.201	2.52	<.05	.04	-.616	-1.82	>.05	
Assertive	.127	1.61	>.05	.02	-1.22	-2.22	<.05	
I X A					1.582	2.48	<.05	.03
<i>Overall</i>				$R^2=.06^*$				$R^2=.09^{*a}$

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
<u>Males</u>								
Interpersonal Sensitivity	.393	5.12	<.05	.15	.249	.80	>.05	
Assertive	.057	.74	>.05	.00	-.113	.31	>.05	
I X A					.249	.48	>.05	.00
<i>Overall</i>				$R^2=.17^{**}$				$R^2=.17^{**}$

All *t*-values are statistically significant at reported *p*-values.

**p* < .05

***p* < .01

^aRegression Equation for interactive model $y' = 157.339 - 1.384(I) - 2.172(A) + .0389(I \times A)$

R-8 (Continued).

Assertive as Self-Oriented Measure

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
<u>All Subjects</u>								
Interpersonal Sensitivity	.311	5.72	<.05	.09	-.155	-.52	>.05	
Assertive	.102	1.87	>.05	.01	.479	-1.61	>.05	
I X A					.759	1.99	<.05	.01
<i>Overall</i>				$\overline{R^2}=.11^*$				$\overline{R^2}=.12^{*b}$

All *t*-values are statistically significant at reported *p*-values.**p* < .05***p* < .01^aRegression Equation for interactive model $y' = 85.772 - .2317(I) - .888(A) + (I \times A)$

Appendix R-9. Gender Differences Survey Sample: Hotelling's T^2 Results with Empathy Related Variables as Dependent Variables.

Dependent Variables	Standardized Coefficients	Structure Coefficients	Univariate F-Values
Empathic Concern	.384	.670	22.80**
Perspective Taking	-.221	.051	.14
Fantasy	.123	.424	9.10**
Personal Distress	.394	.560	15.92**
Denial	-.581	-.830	34.94**

Sample includes 103 females and 101 males.

* $p < .05$

** $p < .01$

Appendix R-10. For Females and Males in Survey Sample: Correlations of
ABS Subscales from Study 1 with All Variables in Study 3.

Variables	ABS Subscales			
	Introspective Absorption	Reality(Nature) Absorption	Synesthesia	Mysticism
<u>Females</u>				
Interpersonal Sensitivity	.09	.23	.10	.01
Self-Reliant	.14	.13	.05	.01
Assertiveness	.15	.09	.07	.09
Empathy	.15	.34	.11	.07
Perspective Taking	.16	.16	.20	.25
Denial Avoidance	-.11	-.29	-.21	-.05
Davis' Fantasy	.29	.51	.34	.30
Self-Esteem	-.19	-.11	-.19	-.26
Private Self- Consciousness	.31	.20	.32	.36
Public Self- Consciousness	.12	-.06	-.09	.10
Anxiety	-.05	.04	-.05	-.01
Personal Distress	.03	.04	.04	.16
Self-Actualization	.01	.10	-.01	.14

Appendix R-10 (Continued).

<u>Variables</u>	ABS Subscales			
	Introspective Absorption	Reality(Nature) Absorption	Synesthesia	Mysticism
<u>Males</u>				
Interpersonal Sensitivity	.45	.37	.25	.30
Self-Reliant	.39	.25	.12	.23
Assertiveness	.24	.12	-.03	.03
Empathy	.25	.30	.10	.21
Perspective Taking	.28	.28	-.01	.19
Denial Avoidance	-.40	-.41	-.23	-.37
Davis' Fantasy	.45	.27	.19	.29
Self-Esteem	-.09	-.11	-.14	-.23
Private Self- Consciousness	.52	.46	.30	.55
Public Self- Consciousness	.33	.05	.15	.18
Anxiety	-.04	-.04	-.07	.01
Personal Distress	-.01	.05	.15	.07
Self-Actualization	.30	.33	.20	.21

Appendix R-11. For Females, Males and All Subjects in the Survey Sample:
Tests of the Joint Relationship of Interpersonal Sensitivity and
Absorption to the Criterion Variable: Perspective Taking.

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
<u>Females</u>								
Interpersonal Sensitivity	.313	3.34	.00	.10	.755	1.56	.13	
Absorption	.177	1.89	.07	.03	1.023	1.12	.27	
I X A					-1.02	-.93	.35	.00
<i>Overall</i>				$\overline{R^2}=.15^{**}$				$\overline{R^2}=.15^{**}$
Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
<u>Males</u>								
Interpersonal Sensitivity	.453	4.68	.00	.17	.668	1.72	.09	
Absorption	.045	.46	.65	.00	-.370	-.64	.52	
I X A					-.458	-.57	.00	
<i>Overall</i>				$\overline{R^2}=.22^{**}$				$\overline{R^2}=.22^{**}$

All t-values are statistically significant at reported p-values.

**p* < .05

***p* < .01

Appendix R-11 (Continued).

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
<u>All Subjects</u>								
Interpersonal Sensitivity	.372	5.55	.00	.13	.587	2.05	.04	
Absorption	.117	1.75	.08	.01	.483	1.01	.31	
I X A					-.479	-.77	.44	.00
<i>Overall</i>				$R^2=.18^{**}$				$R^2=.18^{**}$

All *t*-values are statistically significant at reported *p*-values.

**p* < .05

***p* < .01

Appendix R-12. For Females, Males and All Subjects in the Survey Sample:
 Tests of the Joint Relationship of *Interpersonal Sensitivity* and
Self-Reliant to the Criterion Variable: Perspective Taking.

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
Females								
Interpersonal Sensitivity	.319	3.17	.00	.09	.358	.70	.49	
Self-Reliant	.063	.62	.54	.00	.113	.18	.87	
I X SR				-1.02	-.07	-.08	.94	.00
<i>Overall</i>				$\overline{R^2} = .12^{**}$				$\overline{R^2} = .12^{**}$
Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
Males								
Interpersonal Sensitivity	.422	4.72	.00	.17	.087	.14	.89	
Self-Reliant	.207	2.32	.03	.04	-.119	-.20	.84	
I X SR					.522	.55	.58	.00
<i>Overall</i>				$\overline{R^2} = .26^{**}$				$\overline{R^2} = .26^{**}$

All values subject to rounding error.

* $p < .05$

** $p < .01$

Appendix R-12 (Continued).

<u>Predictor</u>	Additive Model				Interactive Model			
	<u>B</u>	<u>t</u>	<u>p</u>	<u>R²_(unique)</u>	<u>B</u>	<u>t</u>	<u>p</u>	<u>R²_(unique)</u>
<u>All Subjects</u>								
Interpersonal Sensitivity	.368	5.54	.00	.12	.355	.89	.37	
Self-Reliant	.138	2.07	.04	.02	.124	.29	.77	
I X SR					.021	.03	.97	.00
<i>Overall</i>				<u>R²=.18**</u>				<u>R²=.18**</u>

All values subject to rounding error.

*p < .05

**p < .01

Appendix R-13. For Females and Males in Survey Sample: Test of the Joint Relationship of Interpersonal Sensitivity and Self-Reliant to the Criterion Variable: Self-Esteem.

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
Females								
Interpersonal Sensitivity	.161	1.59	.11	.02	.847	1.65	.10	
Self-Reliant	.232	2.29	.02	.05	1.098	1.71	.09	
I X SR					-1.290	-1.36	.18	.01
Overall				$R^2 = .11^{**}$				$R^2 = .12^{**a}$
Males								
Interpersonal Sensitivity	-.166	-1.78	.08	.02	-1.398	-2.21	.03	
Self-Reliant	.442	4.72	.00	.17	-.758	-1.23	.22	
I X SR					1.92	1.97	.05	.03
Overall				$R^2 = .19^{**}$				$R^2 = .22^{**b}$

All values reported subject to rounding error.

* $p < .05$

** $p < .01$

^aRegression Equation for Interactive Model $y' = 1.1453(I) + 1.9731(SR) - .0258(I \times SR) - 25.659$ (Females)

^bRegression Equation for Interactive Model $y' = -1.349(I) - 1.158(SR) + .0324(I \times SR) + 111.00$ (Males)

Appendix R-14. For Females and Males in Survey Sample: Correlations for Self-Consciousness Scales with Davis' Interpersonal Reactivity Index Scales.

	Empathic Concern	Perspective- Taking	Fantasy	Personal- Distress
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Females

Private Self-Consciousness	.16	.20	.30	.15
Public Self-Consciousness	.08	-.01	.07	.26
Social Anxiety	.13	.07	.16	.35

	Empathic Concern	Perspective- Taking	Fantasy	Personal- Distress
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Males

Private Self-Consciousness	.14	.21	.38	-.04
Public Self-Consciousness	.04	.01	.16	.18
Social Anxiety	.20	-.06	.03	.55

Results for 102 females and 101 males.

**Appendix R-15. For Females, Males and All Subjects in Survey Sample:
Test of the Joint Relationship of Interpersonal Sensitivity and
Self-Reliant to the Criterion Variable: Self-Actualization.**

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
Females								
Interpersonal Sensitivity	-.256	-2.71	.01	.05	-.576	-1.19	.23	
Self-Reliant	-.312	-3.30	.00	.08	-.716	-1.18	.24	
I X SR					.602	.67	.50	.00
<i>Overall</i>				$\overline{R^2}=.22^{**}$				$\overline{R^2}=.22^{**}$
Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{(unique)}$
Males								
Interpersonal Sensitivity	-.204	-2.25	.03	.04	.306	.49	.62	
Self-Reliant	-.405	-4.48	.00	.15	.091	.15	.88	
I X SR					-.795	-.83	.41	.00
<i>Overall</i>				$\overline{R^2}=.25^{**}$				$\overline{R^2}=.25^{**}$

All values reported subject to rounding error. Analyses include 103 females and 101 males. For this analysis, low self-actualization scores associated with high psychological self-actualization.

* $p < .05$

** $p < .01$

Appendix R-15 (Continued).

Predictor	Additive Model				Interactive Model			
	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{\text{(unique)}}$	<i>B</i>	<i>t</i>	<i>p</i>	$R^2_{\text{(unique)}}$
All Subjects								
Interpersonal Sensitivity	-.245	-3.81	.00	.05	-.258	-.66	.51	
Self-Reliant	-.352	-5.46	.00	.11	-.365	-.88	.40	
I X SR					.021	.03	.97	.00
<i>Overall</i>				$R^2=.23^{**}$				$R^2=.23^{**}$

All values reported subject to rounding error. Analysis includes 103 females and 101 males. For this analysis, low self-actualization scores associated with high psychological self-actualization.

* $p < .05$

** $p < .01$

END

29.05.92

FIN