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SELF-CONSCIOUSNESS, SELF-AWARENESS  
AND PAIN

by Brian J. MacLean

Thesis presented to the School of Graduate Studies  
of the University of Ottawa as partial  
fulfillment of the requirements for the  
degree of Doctor of Philosophy

Ottawa, Canada, 1985



Brian J. MacLean, Ottawa, Canada, 1986.

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## CURRICULUM STUDIORUM

Brian J. MacLean was born January 8, 1948 in Glasgow Scotland. He received a Bachelor of Arts degree from the University of Miami in 1969, and the Master of Arts degree in Psychology from the University of Ottawa in 1979. The title of his thesis was The Effect of Subliminal Auditory Verbal Stimulation on a Simple Motor Performance Task.

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## GLOSSARY OF TERMS

Objective Self-Awareness: This term is used in Duval and Wicklund's objective self-awareness theory to denote the state of consciousness in which the individual is focused on any self-aspect (e.g., body, personal history, or conscious state). This state is assumed to be elicited by certain stimuli in the environment (e.g., audience, camera, and mirror). Duval and Wicklund neither postulate nor speculate about individual differences regarding objective self-awareness.

Subjective Self-Awareness: This term is used in Duval and Wicklund's objective self-awareness theory to refer to the state of consciousness in which the individual is focused on events exterior to the person's body, history or conscious state.

Public Self-Aspects: This term refers to those aspects of the self which are potentially observable by others.

Public Self-Awareness: This term is used in Buss' self-consciousness theory to refer to that transient state of consciousness in which attention is focused on public self-aspects (e.g., physical appearance). The first main cause of public self-awareness is being observed by an audience on technological monitors. This type of induction is predicted to involve a certain degree of discomfort due to shyness, audience anxiety or embarrassment. Objective self-

awareness theory, on the other hand, predicts a resulting real/ideal self negative discrepancy in this type of situation.

The second main cause of public self-awareness consists of nonsocial perceptual feedback, and is exemplified by photographs of oneself, full length mirrors, as well as audio and video recordings of oneself. Both objective self-awareness theory and self-consciousness theory predict a real/ideal self negative discrepancy when self-focused attention is elicited by these type of stimuli.

Public Self-Consciousness: This term is used in Buss' self-consciousness theory to refer to the disposition involving attentional focus on public self-aspects. Those individuals high on this dimension tend to react more strongly to public self-awareness inducers than those low on this personality dimension. It is noteworthy that public self-consciousness is activated only in the presence of public self-awareness inducers and that in their absence, no behavioral differences are seen between those high and low on the dimension.

Public Self-Focus: This term may be used to refer to either public self-awareness or public self-consciousness.

Private Self-Aspects: This term refers to those aspects of the self which have a private, experiential quality. Private self-aspects include such events as bodily feelings, motives and cognitions.

Private Self-Awareness: This term is employed in Buss' self-consciousness theory to refer to that transient state of consciousness in which attention is focused on private self-aspects. This state is presumed to result in both a better knowledge of these private self-aspects and the intensification of any affective charge on these aspects. Private self-awareness may be self-produced by such activities as writing a diary, introspection or certain forms of meditation. Self-consciousness theory also assumes that this state is induced by observing one's reflection in a shaving size mirror. In contrast to objective self-awareness theory, no real/ideal self negative discrepancy is assumed to follow this type of self-focused attention.

Private Self-Consciousness: This term is employed in Buss' self-consciousness theory to refer to the disposition involving attentional focus on the private self-aspects. Those individuals high on this dimension tend to regularly attend to these internal aspects of the self, with the concomitant implications of more highly polarized affect and greater self-knowledge than those low on the dimension.

Private Self-Focus: This term may be used to refer to either private self-awareness or private self-consciousness.

Situational Self-Focus: This term refers to private and public self-awareness, since both of these states are assumed to be induced by situational (environmental) stimuli. Strictly speaking, private self-awareness may be self-produced. However, in the present work, private self-awareness is primarily considered as a consequence of external eliciting stimuli. It may be noted that the state of objective self-awareness, since it is solely produced by eliciting stimuli, could also be classified under this rubric.

Dispositional Self-Focus: This term refers to both public and private self-consciousness.

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## ABSTRACT

This study investigated the effects of the dispositional dimension of self-consciousness and the manipulation of self-awareness on laboratory induced pain. Subjects were initially assigned to four groups defined by high and low scores on private and public self-consciousness. Within each of these groups, subjects were further divided into one of four experimental conditions during the Cold Pressor Test: mirror exposure (private self-awareness), camera exposure (public self-awareness), spot exposure (attention control) and a non-focus control condition. Subjects underwent two trials of the Cold Pressor Test, the first trial serving as a baseline measure. The dependent measures included pain magnitude and tolerance duration as well as a number of post-experimental inquiries regarding the experienced pain. Contrary to theoretical predictions, high private self-consciousness subjects tended to be slower at terminating hand immersion than those low on this dimension. It was furthermore noted that a greater number of high private self-consciousness subjects spontaneously used a strategy than did those low on this scale. These data do not however provide a clear understanding of the relationship between private self-consciousness, strategy use, and pain. The retrospective measure of pain magnitude when first experienced during hand immersion yielded higher scores for subjects at the high end of the public self-consciousness dimension. Subjects required to focus on a mirror showed proportionately less on-target visual contact than did camera and spot exposure subjects. No

differences were found between self-awareness manipulations with regard to the pain-related measures. The role of self-focus and strategy use are included in a discussion of methodological and theoretical issues.

## Chapter I

### REVIEW OF THE LITERATURE

#### Objective Self-Awareness Theory

The concept of self-focus as construed by a number of contemporary researchers can be most directly traced to the theory of symbolic interactionism. The founder of this school, Charles Horton Cooley, maintained that self-awareness is tantamount to taking the perspective of another with regard to oneself (Cooley, 1902).

George Herbert Mead, another member of this school of thought, held similar ideas regarding the self. Mead (1934) contended that a subjective feeling of oneself is insufficient for selfhood. The individual, he argued, must also be able to externalize his vantage point from its internal organismic location to a position of outside observation. This capacity for detachment, said Mead, is not inherent in the person, but develops through interactions within a social matrix. As a result of developing this distancing capacity, the self develops as a composition of the perceptions and judgements of the other members of the social fabric.

In the normal adult individual, Mead saw consciousness as bifurcated to form two distinct types of awareness. The first type of consciousness is developmentally more primitive in the sense of being limited to an awareness of the organism interacting with the

environment. In this type of consciousness, the direction of attention is external to the individual. The second kind of consciousness, according to Mead, results from a transformation of the other's awareness of one's own self into one's own consciousness of self. This transformation, said Mead, is accomplished through social learning.

A recent socially based self-awareness theory was put forth by Duval and Wicklund in 1972. The primary defining construct of the theory has been called "objective self-awareness" by these authors. Objective self-awareness is considered to be one of the two directionally defined states of consciousness associated with the self-structure. The other directionally defined state of consciousness has been termed "subjective self-awareness". The basic distinction between objective self-awareness and subjective self-awareness involves a focus of attention either on the self or the environment respectively. Put in different terms, the dichotomous split presents the self on the one hand as an actor and on the other as an object.

Subjective self-awareness is a state of consciousness where the self is only experienced as a function of feedback from interaction with the environment. In the subjective self-awareness state one is aware of the self as the locus of perception and behavior, but the attentional vector is towards the external world. In contrast, the objective self-awareness state is a condition where attention is directed to the personal aspects of the individual. These personal aspects include the body, developmental history and contents of consciousness. Duval and Wicklund state that attention cannot be directed to the self and the

environment concurrently. The apparent simultaneity of experience of oneself and the environment is, according to objective self-awareness theory, the sequential shifting of attention between an internal and external focus. Theoretically, the degree to which a particular type of awareness is present is a function of the proportion of time in that attentional mode, regardless of the frequency of oscillation between it and the other attentional pole.

As may be apparent, Duval and Wicklund's conception of the split in consciousness is different from Mead's formulation. Mead, as previously discussed, bifurcated consciousness according to type. This is, out of the primary awareness a reflexive awareness develops. This reflexive awareness operates by adopting the other's viewpoint regarding the self as if it were one's own perception. In contrast, objective self-awareness theory treats awareness of self as not fundamentally different from an awareness of objects in the environment. That is, a bidirectional unified consciousness is postulated as opposed to Mead's two distinct varieties of consciousness.

A primary consequence of objective self-awareness is a movement on the self-evaluation dimension occurring a short duration of time after the onset of internal focus. The evaluation of self occurs from a perspective of internal standards of rectitude regarding behavior, beliefs and character traits. Duval and Wicklund conceptualize these standards as originating from perceptual judgements or social learning. The self-evaluation involves a comparison between ideal standards on these dimensions and the actual conditions observed. As originally

stated in the theory, this within-self discrepancy is the result of a scanning of self-characteristics and is followed by negative affect. This negative affect is considered to be proportionate to the size of the within-self discrepancy and to the length of time that this discrepancy is focused upon. In the absence of a salient intraself discrepancy, objective self-awareness theory maintains that self-focus still leads to negative affect. This movement to a dysphoric state results from attentional scanning of different self-aspects which inevitably leads to a negative self-evaluation in one respect or another.

Regarding the determinants of attentional focal direction, Duval and Wicklund hold that they are located in the external rather than internal environment. In line with this environmentally determined focus of attention formulation, no attempts were made by these authors to postulate individual differences associated with a particular focusing propensity. Subjective self-awareness, or external focusing, is considered to be the predominant state of consciousness and is only deactivated with the perception of self-related stimuli. Thus, self-related stimuli and those stimuli in the environment which focus attention external to the self determine where awareness will be directed at any particular point in time. Although the stimuli which remind an individual of his object status in the world will vary somewhat from person to person, certain stimuli are generally assumed to induce objective self-awareness. These stimuli, typically used to establish objective self-awareness in a laboratory setting, include

presence of visual or auditory recording and feedback devices, a mirror reflection and a photograph of oneself. Theoretically, objective self-awareness may be induced by focusing on areas of the body. However, Duval and Wicklund maintain that this induction method suffers from difficulty in determining which stimuli reliably lead a person to examine particular body parts.

A more complex objective self-awareness induction method is that of audience presence. In this situation, self-focus effects are complicated by the nature of the relationship between the observer and observed. This relationship may include such factors as differences in role, status and social power positions. Although Duval and Wicklund suggest that these and other observer qualities can assume importance in determining the self-aspect which is evaluated, no research within the objective self-awareness literature has yet manipulated audience variables.

Regarding the behavioral consequences of objective self-awareness, as already discussed, the self-evaluation entailed by this state leads to negative affect. Duval and Wicklund postulated that this negative affect is a motivational factor leading to actions directed towards a reduction of objective self-awareness, and a consequent decrease in negative affect. These actions or strategies can be categorized under the rubrics of avoidance and discrepancy reduction. Avoidance behaviors include both an explicit movement away from self-focusing stimuli and an active seeking of distractions from these stimuli. An example of the former behavior might be leaving the presence of a mirror reflection,

while the latter could be engaging in some motor activity (e.g., pacing) while delivering a speech to a group. ☺

Discrepancy reduction, the second strategy for decreasing the negative affect resulting from objective self-awareness involves either attempts to attenuate a high intraself discrepancy or preclude the possibility of a discrepancy by acting in congruence with personal standards. An example of the first type of behavior can be seen in a situation where an individual finds personal actions at variance with his or her moral standards and chooses to alter behavior to regain within-self consistency. An illustration of the second course of action can be seen in the case of individuals behaving in a manner consistent with professed attitudes related to the behavior. With regard to the order of occurrence or preference of these reactions of avoidance and discrepancy reduction, Duval and Wicklund's original formulations presented no clear statement. However, a later presentation posits that the method requiring the least amount of time will be the preferred route. Wicklund now considers avoidance of objective self-awareness inducing stimuli or seeking distractions as the most probable initial strategies (Wicklund, 1978; Wicklund & Frey, 1979). If the situation does not permit termination of objective self-awareness by these means, then discrepancy reduction attempts will be initiated to reduce negative affect.

With the exception of a minor revision, objective self-awareness theory remains in roughly the same form that it did at its inception. This revision concerns the type of affect resulting from objective

self-awareness. In the original statement, as already discussed, the affect occurring with objective self-awareness induction was assumed to be negative. In the more recent theoretical work, objective self-awareness is considered to lead to positive affect following a success experience (Wicklund, 1978). That is, when a positive discrepancy exists between standards and real conditions, focusing on oneself will entail positive affect. As the size of the positive discrepancy increases, so too will the intensity of the positive affect. Wicklund argues, however, that naturally occurring discrepancies are typically negative. Although an experience of success may initially create positive discrepancies, this effect diminishes with time and with the growth of new ambitions. These new goals once again produce discrepancies between real and ideal conditions.

In summary, objective self-awareness theory is primarily a theory of motivation in which the drive qualities are determined by the direction of focused attention. The direction of attention is contingent upon the nature of environmental stimuli. When the individual perceives stimuli which remind him or her of the self, objective self-awareness will occur. In the absence of these stimuli the individual is generally in a state of subjective self-awareness. That is, the predominant state of consciousness is attentionally involved with objects in the world rather than the self. Each of these states of consciousness precludes the other from occurring simultaneously. However, consciousness often oscillates rapidly between these two states with the apparent experience of being able to attend to the environment and the self concurrently.

When in a state of self-focus, it is assumed that a self-evaluation process is activated. This self-evaluation results in a perceived discrepancy between one's present reality and one's standards. Most of these discrepancies are negative in nature and are accompanied by negative affect. The motivational end-products of objective self-awareness are avoidance of self-focus inducing stimuli, or attempts to reduce intraself discrepancies. The predominant initial response is avoidance, followed by discrepancy reduction efforts if avoidance is not possible.

#### Research

The research findings in the objective self-awareness literature have been primarily concerned with the reactions to self-focus in situations where salient standards are present. Investigations have generally employed social psychological paradigms and have been conducted within such areas as conformity, attitude change, performance facilitation, attribution and self-esteem research. However, the present review of objective self-awareness investigations is not ordered according to particular areas of psychological research, but rather according to the various reactions to objective self-awareness. That is, selected studies will be reviewed within sections discussing both the initial reactions to self-focus (i.e., self-orientation and self-evaluation) and the motivational consequences of self-focus (i.e., avoidance and discrepancy reduction).

### Self-Orientation

In their early work in objective self-awareness theory, Duval and Wicklund primarily focused on the aversive nature of the objectively self-aware state and the ensuing reactions. However, little mention was made of the validity of the stimuli used to establish the objective self-awareness state. A number of studies subsequent to the initial theoretical formulations have investigated the link between self-focus and the stimuli presumed to induce this state. Davis and Brock (1975) attempted to evaluate the effects on attention of stimuli which have been traditionally utilized to induce objective self-awareness. They argued that if these stimuli did increase self-focus, this should be reflected in the content of verbal output. That is, verbal productions made in a self-focused state were assumed to contain a greater number of self-reference statements than when attention is externally focused. In bogus translation tasks, subjects were found to translate more foreign words into English personal pronouns in the presence of a mirror and in the presence of a camera. Davis and Brock interpreted these results as direct support for the assumption that theoretically postulated objective self-awareness inducing stimuli do in fact lead to self-focus. Furthermore, this induced self-focus was found to influence cognition in a manner consistent with the theory.

In a second study by Geller and Shaver (1976), the Stroop-color word test (Stroop, 1938) was used to measure the combined effects of a

mirror and camera on cognition. These authors argued that Davis and Brock's results suffer from two types of ambiguity. First, it is difficult to conclude whether the personal pronoun output measure used by Davis and Brock is due solely to attentional self-focus, or is a combination of self-focus and an ability or willingness to tolerate objective self-awareness; that is, objective self-awareness may increase as a result of personal pronoun use. The second type of ambiguity is the projective quality of the pronoun measure. That is, although self-related cognitions may be occurring, the individual may not be willing to report them.

Geller and Shaver reasoned that a modified version of the Stroop procedure would provide a more direct measure of cognitive activity than Davis and Brock's method. They operated under the assumption that latency in identification of the color in which a word is printed will be greater when an individual has been thinking of an associated word. Consistent with this reasoning, the results showed that subjects in the presence of a mirror and a camera had significantly longer color naming latencies for self-relevant than for neutral words. Thus the objective self-awareness manipulation appears to have activated self-related cognitions. However, the combined use of a mirror and camera to induce objective self-awareness raises the question of the individual validity of each of these techniques as a self-focus inducer.

In a study by Carver and Scheier (1978), the validity of a mirror and an audience as self-awareness induction procedures were tested in separate experiments. These authors employed Exner's Self-Focus Sentence

Completion (SFSC) questionnaire (Exner, 1973) as the dependent measure. The SFSC was designed to measure self-focus, external focus, ambivalent focus, or none of the preceding focal orientations. The results indicated that both the mirror and the audience presence led to a significantly greater proportion of self-focus responses than when the mirror and audience were absent.

### Self-Evaluation

The previously discussed studies illustrate that the immediate cognitive products of exposure to self-focusing stimuli are characterized by an increase in self-relevant responses. Following the initial self-orienting reaction, the next response to occur in the objective self-awareness behavioral sequence is that of self-evaluation. Although contemporary theoretical work in objective self-awareness theory (Wicklund, 1979) recognizes other possible responses to self-focus (e.g., in situations without salient standards) than those considered in the earlier formulations (Duval & Wicklund, 1972; Wicklund, 1978), the within-self discrepancy response sequence still remains the core aspect of the theory. The first part of the discrepancy response sequence involves the process of self-evaluation. In a study by Duval and Wicklund (1973) subjects were presented with hypothetical situations to which they were asked to assign responsibility for positive or negative outcomes either to the self or to an imagined other. They found that in the presence of a mirror subjects attributed

significantly more responsibility to themselves regardless of the outcome valence.

A later study of attribution of causality suggests, however, that the relationship between self-focus and attribution of responsibility is more complex than is apparent in the aforementioned study. Federoff and Harvey (1976) conducted an experiment in which subjects presented therapeutic instructions and anticipated producing either a negative or positive outcome on a hypothetical phobic patient. Some subjects in each expectancy group received feedback that their instructions had resulted in either a negative or positive outcome. Results indicated that in the presence of a camera more self-attributions were made for positive as opposed to negative outcomes. However, again in the camera present condition, attributions to the "patient" were relatively higher when positive outcomes were expected and negative outcomes occurred. Thus, a reversal of the theoretically expected direction of causal attribution resulted when the experimental situation was more ego-involving. That is, instead of making attributions according to focus of attention, subjects showed a self-protection type of response under objective self-awareness conditions. This prepotency of an ego-defensive reaction suggests that factors other than attentional focus play a greater role than presumed in Duval and Wicklund's original theoretical statements.

A recent study by Nadler (1983) also illustrates increments in self-defensive attributions under objective self-awareness conditions. Subjects who were high and low on a self-esteem measure performed a self-relevant task (creativity test) in high and low objective

self-awareness situations. The results showed that objective self-awareness is associated with low self-esteem subjects making more dispositional attributions for a failing performance and high self-esteem subjects attributing more to dispositional factors for successful performances. Like the Federoff and Harvey (1976) study, the results of Nadler's research also appear incompatible with the Duval and Wicklund (1973) findings, where unidirectionality of causal attributions was found. A possible explanation for the aforementioned discrepancy is that the two former studies employed ego-relevant tasks whereas the Duval and Wicklund (1973) research did not.

A study by Vallacher and Solodky (1979) investigated the effects of objective self-awareness on self-evaluation when different types of standards were employed. These authors argued that most objective self-awareness research has addressed situations where standards are based on morality and normatively acceptable social behavior. In contrast, they studied the relationship between morality-based and competency-based standards under objective self-awareness conditions. Their design involved a conflict between these two classes of standards. It was predicted that when subjects were led to believe that success on a specific task was due to ability rather than luck, they would be more likely to cheat under objective self-awareness than non-objective self-awareness conditions. The results were consistent with these predictions. It appears that the discrepancy among the three previously discussed studies (Duval & Wicklund, 1973; Federoff & Harvey, 1976; Nadler, 1983) can also be understood by appealing to the explanation

offered by Vallacher and Solodky regarding their own research. That is, in the study by Duval and Wicklund (1973) the context for making attributions involved moral values while the contexts in Federoff and Harvey's (1976) and Nadler's (1983) research were concerned with competence as a value. Thus, rather than construing either ego-defensiveness or attentional-focus as the most potent variable in determining attributional behavior, it may be more directly related to the type of standard made salient by the context.

From a methodological perspective it is of interest that Vallacher and Solodky induced objective self-awareness by the presence of both a mirror and a tape recording of the subject's own voice. Each of these manipulations, as well as the control manipulations, were presented to the subject as "potential visual" and "potential auditory" distractions. In the objective self-awareness condition, it is unclear whether this type of instructional set would induce self-focus in the same way as the usual situation where the instructions relate the self-focusing stimuli to extra-experimental purposes. Perhaps the differences found between objective self-awareness and non-objective self-awareness conditions are more associated with some distractability dimension in the mirror reflection and own voice recording than with their self-focusing qualities. A further question arises with regard to the subject's interpretation of the mirror. The authors state that the mirror was attached to the wall. At the time that this study was conducted (1979), it is questionable if university students serving as subjects in a psychology experiment would not suspect a wall mirror to be of the

two-way variety concealing an observer (especially in a situation where cheating with impunity appeared possible).

In the area of self-esteem and objective self-awareness, a number of studies may be presented to examine the self-evaluation aspect of self-focus. Ickes and Wicklund (Duval and Wicklund, 1972, pp. 24-27) asked subjects to complete questionnaires indicating their real and ideal selves on bipolar adjective scales. Half of the subjects filled out the scales while listening to an audio recording of their own voices (high objective self-awareness) while the remaining subjects listened to a recording of another's voice (low objective self-awareness). The results indicated a significantly greater intraself discrepancy in the high objective self-awareness condition for the first five items on the twenty-item scale. It is unclear why this objective self-awareness effect diminished over subsequent five-item blocks. Duval and Wicklund (1972) suggest that the objective self-awareness stimulus may lose its response eliciting potency as a result of exposure time. Another possibility, and consistent with objective self-awareness theory, is the presumed aversiveness of self-focus which would lead to efforts to avoid listening to the tape as much as possible. However, the experimental design did not include a method of monitoring the subject's degree of attention with regard to the tape.

In a study by Ickes, Wicklund and Ferris (1973) subjects were administered a bogus test which presumably measured some important trait. Some subjects received negative feedback and some positive feedback on the test. Subjects were then asked to rate themselves on a

self-esteem questionnaire and on the bogus trait. In the negative feedback condition, results showed that only the self-esteem ratings were lowered in the presence of a mirror while the bogus trait ratings were unaffected. The authors interpreted these findings as sensible in that the bogus trait, which was not described in terms of content, may have been trivialized by the subjects. On the other hand, the self-esteem dimension, because of its inflexible quality, may have been more susceptible to self-criticism. That is, self-esteem is a product of long-term experience and many of the traits on which it depends are relatively fixed (e.g., intelligence). Furthermore, when a subject is made aware of an intraself discrepancy of a fixed type, the resulting self-critical reaction can be measured since a rapid discrepancy reduction is unlikely.

The last study to be reported in this section was conducted by Scheier and Wicklund (Wicklund, 1978, p. 474). Subjects were again given a bogus test ("psychological mindedness"), followed by negative feedback on test performance. They then filled out a real-ideal self questionnaire, the real self part of which had already been completed (at the low end of the scale) by the experimenter. Those subjects who completed the questionnaire in the presence of a mirror showed higher ratings on the ideal self. Thus, if the real self has been definitely fixed or categorized, the degree of aspiration as reflected by ideal-self judgements will be relatively higher under objective self-awareness conditions.

In summary, some of these studies have been presented by Wicklund (1978) as examples of the initial self-evaluation response prior to discrepancy reduction or avoidance reactions. As Wicklund aptly points out, this measurement of the initial self-evaluation response is difficult in the sense that discrepancy reduction strategies follow closely in time. In the study by Ickes and Wicklund (1971), the lack of an effect in the objective self-awareness condition subsequent to the first five items, may be associated with the onset of the discrepancy reduction process. In the research by Ickes, Wicklund and Ferris (1973), the drop in self-esteem was interpreted as a manifestation of self-evaluation. However, it may be that by judging himself in a more negative light, the subject in the mirror condition was demonstrating a greater awareness of the value of accepting responsibility for personal deficiencies. This alternate explanation may also apply to the attribution study by Duval and Wicklund (1973). That is, in both of these studies, the acceptance of personal responsibility for outcomes may be part of the discrepancy reduction phase rather than solely a function of self-evaluation.

A case may also be made for the contention that discrepancy reduction (as the concept is used in objective self-awareness theory) was occurring in the second half of the items in the Duval and Wicklund (1973) study. This is suggested by an examination of the mean values of self-attributions over the five presented items. That is, in comparing the first two items with the last two items of the mirror and non-mirror conditions, self-focus appears to be most potent at the beginning of the

item sequence, and proportionally less influential than the non-mirror comparison by the end of the item sequence. Thus, it may be that by the later attribution items, the discrepancy reduction process was more fully activated. A more extended analysis of the self-evaluation response is both beyond the interests of this paper and would be plagued by unresolvable speculations at the present state of the research. However, the issues raised do present some of the problems in measuring this first event in the discrepancy reduction sequence.

#### Avoidance

Subsequent to the assumed self-orientation and self-evaluation processes, objective self-awareness theory holds that the self-focusing stimuli will be avoided if possible. Theoretically, the three most typical avoidance methods include a reduction of proximity to objective self-awareness inducing stimuli, engaging in motor-activity distractions, and attending to some aspect of the external environment.

An early study by Duval, Wicklund and Fine (1972) illustrates the theoretical assumption that avoidance of the objective self-awareness state occurs when both self-focus and a permanent discrepancy are present. Subjects were given bogus positive or negative feedback from a fabricated personality measure which presumably measured creativity and intelligence. The bogus test scores were presented as either in the upper or lower 10th percentile with respect to peer group scores. Self-focus was manipulated by the presence of both a mirror and camera.

Following test feedback, the subject was placed in a room with or without these stimuli. The length of time that the subject waited in the room after receiving instructions that a second experimenter would arrive within five minutes, was used as the primary dependent variable.

The results indicated that as the discrepancy between performance on the personality measure and a reference group average increased in the presence of the self-focusing stimuli, the exit time latency decreased. Two points of theoretical interest in this study involve the choice of reactions to objective self-awareness and the relationship between discrepancy magnitude and consequent behavior. In addressing the first point, it is noteworthy that the experimental design in this study precluded a discrepancy reduction strategy; subjects were restricted to an avoidance reaction due to the relative inflexibility of the trait in question. Whether or not avoidance would have remained the predominant reaction in the face of a more flexible trait could not be answered by this study. Secondly, it would have been interesting to see what type of relationship existed between discrepancy magnitude and avoidance latency. That is, would more intermediate feedback score values have resulted in corresponding exit latency differences?

The study by Davis and Brock (1975) already mentioned in relation to the use of self-related words under objective self-awareness conditions, also illustrates avoidance behavior. Those subjects in the presence of a mirror or a camera who received negative feedback on a creativity test tended to use less self-relevant words. These results indirectly suggest an avoidance of the self-focused state.

An example of using motor activity distractions as a way of avoiding self-focus is found in an experiment by Libling, Seiler and Shaver (1974). Smokers were placed in a room either with or without a mirror. Those subjects in the mirror condition were found to engage in more cigarette-associated activity than those without a mirror. It is of interest to note that this finding is in conflict with the hypothesis of these authors. They predicted that in the presence of a mirror, subjects should attempt discrepancy reduction by engaging in less smoking associated activities. The avoidance distraction strategy may have been chosen in this situation due to the motivational connection between the motor activity (i.e., smoking-related behavior) and the behavior subject to real-ideal discrepancy evaluation (i.e., cigarette smoking).

A recent study by Greenberg and Masham (1981) investigated the avoidance reaction using a counterattitudinal statement paradigm. Subjects read statements counter to, neutral to, or consistent with attitudes on a particular issue. Subjects were then given the option of seeking or avoiding self-focus by sitting facing a mirror or a non-reflective surface. After choosing the mirror or non-mirror position, subjects were rated on how interested they were in hearing a recording of themselves reading their respective statements. The results indicated that subjects reading counterattitudinal statements actively avoided the objective self-awareness stimuli, while those reading consistent statements sought out the objective self-awareness stimuli. Thus, in the absence of an available discrepancy reduction response, avoidance occurred following attitudinally discrepant behavior. This

latter finding is consistent with the original objective self-awareness theoretical assumptions. On the other hand, the results of the positive discrepancy condition are at variance with these same assumptions, in that self-focus was originally regarded as aversive regardless of the situational context. However, as already discussed, a later revision of objective self-awareness theory included the possibility of positive affect resulting from an interaction of self-focus and a positive discrepancy (Wicklund, 1978).

The next study to be discussed as representative of the avoidance reaction was conducted in a natural field-setting (McDonald & Eilenfield, 1980). Research studies presented up to this point have investigated induction of short term laboratory-based discrepancies. In this study, subjects were rated on scales of physical attractiveness by unobtrusive experimenter observers as they walked down a path bounded by mirror-like windows. The avoidance or seeking of self-awareness was judged according to the time spent in self-observation, by a different observer. The results indicated a linear relationship between physical attractiveness and mirror-gazing activity. That is, the more attractive subjects sought self-focus more than the less attractive subjects. This study illustrates that individuals tend to expose themselves more to self-awareness stimuli when a long-term positive discrepancy is suggested.

The last study on avoidance to be reviewed used a self-disclosure situation in conjunction with mirror induced self-awareness. Archer, Hormuth and Berg (1982) presented subjects with intimate or non-intimate

topics to be recorded in front of a mirror or a non-reflective surface. The authors assumed that the nature of disclosing intimate details necessarily entails negative discrepancies and is thus intrinsically unpleasant. As predicted, those subjects in the high self-awareness condition who discussed intimate topics showed the greatest latency times in beginning their verbal responses, enjoyed the situation least and gave the least complete descriptions of the self-related topics. Thus, self-awareness conditions were associated with behavioral measures which suggest an overall strategy of avoidance.

In summary, the preceding studies illustrating avoidance reactions to negative discrepancies are consistent with the original objective self-awareness formulations. Each study used a relatively inflexible trait which, according to Duval and Wicklund (1972), should lead to avoidance. This issue of trait flexibility and consequent reactions will be discussed later within the context of more recent research findings. Regarding positive discrepancies, the studies by Greenberg and Musham (1981) and McDonald and Eilenfield (1980) presented evidence inconsistent with Duval and Wicklund's (1972) early theoretical work. However, as already mentioned, Wicklund (1978) modified objective self-awareness theory in the light of such evidence to allow for a positive affective valence being associated with positive discrepancies.

### Discrepancy Reduction

Discrepancy reduction responses, as the concept is used within the objective self-awareness literature, typically means behaving in congruence with a personal or moral standard, moving in the direction of a goal, or increasing self-report/behavior consistency. As already discussed, Duval and Wicklund's (1972) early theoretical work was equivocal regarding the sequential order of chosen reactions to self-focus. However, later objective self-awareness formulations (Wicklund, 1979) favored avoidance rather than discrepancy reduction as the first motivational consequence of self-focus.

In an early study by Wicklund and Duval (1971), performance on a prose-copying task was used to measure discrepancy reduction attempts. It was predicted that performance would be facilitated by an increase in self-focus, since attending to the self should result in higher awareness of and attempts to reduce within-self discrepancies. In this case, the within-self discrepancy would result from attempts to match an implicit standard of adequate performance. The results supported this prediction. That is, performance, as defined by the amount of prose copied in a foreign language (German), significantly improved in the presence of a mirror.

Liebling and Shaver (1973) conducted a study on performance facilitation using a similar prose copying task to that employed in the previous study. This study is different from Wicklund and Duval's (1971) research in that an evaluation component was added. Specifically,

subjects performed a prose copying task under conditions of high and low evaluation, and with or without the presence of a self-focusing stimulus (mirror). The results indicated that objective self-awareness induced under a highly evaluative situation (i.e., the task was presented as highly correlated with intelligence) was associated with a performance decrement. On the other hand, in a low evaluation situation, the performance facilitation noted by Wicklund and Duval (1971) was again observed. Liebling and Shaver concluded that the high evaluation condition increased objective self-awareness to a degree which proved inimical to performance. That is, with attention primarily focused on the self, attention was withdrawn from the task with a consequent drop in performance.

In a study by Innes and Young (1975), subjects performed a mirror-tracing task under conditions of either low or high evaluation apprehension. Self-focus was induced in each of these groups by a mirror and/or an audience. Non-objective self-awareness control groups were also present under both levels of evaluation. Perhaps the most interesting result in this study was that the best performance was found in the mirror high-evaluation group. This finding is at odds with the previous study by Liebling and Shaver (1971), where performance decrements occurred with high evaluation and self-focus. This apparent contradiction may have been associated with the level of self-awareness induced in each study. That is, the mirror-tracing task in this study may have necessitated a greater degree of attentional focus than the copying task in Liebling and Shaver's study. It would theoretically

follow that a higher attentional focus on external events would diminish self-focus. A low degree of self-focus would in turn make it less likely that high evaluation would exert a potent negative influence on performance.


Within the area of conformity, a number of studies have applied the self-awareness paradigm. Wicklund and Duval (1971) surveyed subjects' opinions on a number of social-political issues. At a later date, their opinions were once again measured on these issues. Half of the subjects were informed of the average opinions of their peers, while the remaining subjects were informed of opinions which presumably belonged to prison inmates. Just prior to the second opinion questionnaire, subjects either listened to a recording of their own voice, or to the voice of someone else. The results showed that those subjects given knowledge of their own peer group opinions conformed significantly more when listening to their own voice. On the other hand, no significant differences were found for self-focus with a negative reference group (i.e., prison inmates).

A study by Diener and Wallbom (1976) investigated the effects of deindividuation on conformity to the moral standard of "fairness". Zimbardo (1970) describes the internal deindividuated state as one where the individual loses self-consciousness, the result of which is a diminution of concern over evaluation by others. The authors predicted that a self-awareness inducing environment would inhibit antinormative behavior. Subjects were provided with the opportunity to cheat with impunity on a test of anagrams. Half of the subjects were made

self-aware by the presence of a mirror and a recording of their own voice. The remaining subjects listened to another's voice with no mirror present. The findings indicated that significantly more subjects cheated in the non self-aware condition. The conclusion drawn was that self-awareness and the consequent reduction in transgressive actions can be induced by other than social situations. In terms of discrepancy reduction, subjects were more likely to behave in accordance with a moral standard under self-focus conditions.

Two methodological issues are noteworthy in this study. First, in the self-awareness condition, the mirror used was a two-way visual monitor. The same questions regarding the effectiveness of experimental duplicity which were raised earlier in reference to the Vallacher and Solodky (1979) study, are equally germane to the present study. That is, it seems unlikely that university students were unaware of two-way mirror technology at the time that this study was conducted. Of secondary interest is the non self-awareness condition. In contrast to the usual manipulation where the non-reflective mirror surface is used in the control condition, the mirror's reflective surface was angled in such a way in this study as to be clearly visible but to preclude a self-reflective image. No research has shown that these two conditions have similar behavioral consequences. Thus the question remains open whether or not the non self-focus angled mirror condition served as an adequate experimental control.

Several studies have explored self-attentional factors in dissonance processes. One study by Wicklund and Duval (1971) measured



subjects' attitudes towards a number of important university issues. Subjects were then asked to copy speeches contrary to generally held positions on these issues. Finally, their attitudes towards these issues were again measured. Objective self-awareness was manipulated during these procedures with the presence of a camera, which would presumably be used to make video-recordings for later viewing by university faculty members. With the camera present, subjects demonstrated a greater degree of opinion change towards the views in the copied speech than found in the no-camera condition. These findings were essentially duplicated in a similar study by Insko, Worchel, Songer, and Arnold (1973). That is, a camera seemed to lead to most attitude change in those subjects who were theoretically experiencing the highest degree of dissonance.

In a later study by Scheier and Carver (1980), subjects were asked to write essays arguing for either a great deal or very little decision making power over their academic program. Some subjects were exposed to a camera, others to a mirror and the remaining subjects to neither manipulation (control group). The results of post-essay questionnaire showed significantly more attitude change in the camera than the mirror and control groups. The mirror and control groups did not differ from one another. The findings in the camera condition are consistent with the two preceding studies. Thus the effects of a mirror and a camera appear to be different. The theoretical framework required to explain this seeming inconsistency will be introduced in a later section, at which time this finding will be rediscussed.

A number of studies have approached the subject of aggression in relation to standards and self-awareness. Objective self-awareness theory would predict that in a situation where aggressive behavior is likely, self-focus should alert the individual to this potential. However, in a situation where the available standards are not permissive regarding aggression, an increase in self-focus should attenuate aggression. In a study by Scheier, Fenigstein and Buss (1974), male subjects assumed the role of a "teacher" to a female confederate. As part of the teaching procedure, subjects were asked to administer electric shocks for incorrect responses. Subjects were divided into mirror present and mirror absent groups. Each of these groups was subdivided into audience present and audience absent conditions.

The results indicate only a main effect for the mirror condition and no interactions. That is, the mirror effects are consistent with the normative standard prohibiting aggression against women. Subjects in the mirror condition presumably were more attentive to this standard and thus displayed a lower level of aggression than subjects without a mirror. It is of interest that the audience had no effect on aggression level in this experiment. The authors speculated that this absence of an effect may have been due to the low incidence of eye contact between the subjects and audience. In a second experiment, eye contact was systematically varied from a low to high number of eye contacts. It was found that when eye contact frequency was high, aggression was significantly inhibited. Thus it appears that aggression was lowered

when both the social (audience) and non-social (mirror) self-focussing stimuli were made salient.

In a related study, Carver (1974) provided subjects with an aggression-related standard rather than relying on a normative standard, as in the aforementioned study. Subjects were instructed that a high level of aggressive behavior (administration of electric shock) facilitates learning on a bogus task. One half of the subjects delivered electric shocks as part of the teaching role in the presence of a mirror, while the remaining subjects performed this role in the absence of a mirror. As predicted, and congruent with objective self-awareness theory, the mirror group aggressed at significantly higher shock levels than the non-mirror group. Thus, this study illustrates that a behavior which generally has anti-normative value (aggressivity) may be facilitated under objective self-awareness conditions when an external source has associated this behavior with desirable outcomes (i.e., increments in learning).

In a third study, Carver (1975) investigated the relationship between attitudes regarding aggression and aggressive behavior. Subjects' attitudes towards physical punishment were measured prior to the experimental procedure. It was predicted that self-focusing stimuli would increase attitude-behavior congruence. In the present situation, this congruence would be reflected by a facilitation of aggression among subjects who favored punishment and an inhibition of aggression among those who opposed punishment. As in the two previously described

studies, subjects assumed teaching roles in a learning situation under mirror and non-mirror conditions.

The results indicated considerable support for the prediction that aggression would be facilitated in self-focused subjects who favored punishment. However, no inhibition of aggression was noted in self-focused subjects who opposed punishment. The reason for this latter finding is not apparent. However, it may have been related to the interpretation of shock intensities at the low end of the scale. That is, those subjects who opposed punishment may not have considered the low shock levels as aversive and thus may not have attempted to curtail their use.

The next and last two studies to be presented in this section are similar to the preceding research by Carver (1975) in that the primary focus is the relationship between objective self-awareness and attitude-behavior consistency. Pryor, Gibbons, Wicklund, Fazio, and Hood (1977) administered a questionnaire to assess subjects' self-reported degree of sociability. Half of the subjects completed the questionnaire in front of a mirror while the remaining subjects did so without a mirror present. At a later date subjects were unobtrusively observed in a social interaction with a confederate. The authors predicted a higher self-report/behavioral correlation regarding sociability in the mirror condition. The results showed that under self-focus conditions the self-report measure had greater behavioral predictive value than under non self-focus conditions. In a second experiment by the same authors, it was found that in the recall of personal academic information,

self-focusing stimuli led to self-reports with a higher correspondence to the actual information than was found in the absence of these stimuli.

Gibbons (1978) extended the attitude behavior consistency issue to the relationship between attitudes towards erotica, self-focus and aesthetic-erotic ratings of sexual material. Male subjects were pretested on their attitudes toward erotica. At a later time, they were asked to rate female nude slides on both attractiveness and the degree of excitement which they elicited, with or without a mirror present. The correlations between pretest scores and attractiveness ratings were not significant. However, pretest self-reports were highly correlated with excitement ratings in the mirror condition. According to the authors, the lack of self-focus effects on the attractiveness ratings may have been due to a relatively greater degree of independence of erotic attitudes from attractiveness ratings than from excitement ratings. That is, consistency would not be violated by finding a nude model attractive while being opposed to erotica, while the same could not be said of a high excitement value attributed to the same model.

The last three studies strongly suggest that a maximal self-report/behavior correspondence results when a self-awareness manipulation is introduced. It seems that a precondition for this high attitude-behavior correlation is the face validity of the self-report measure. That is, if the individual can see the relationship between the questionnaire measure and the behavior in question, self-focusing stimuli seem to increase the consistency between them. However, if the association

between the self-report measure and the behavior is not evident, self-focus may increase the correlation between the self-report measure and the behavior that the subject construes it to be assessing, rather than the behavior under investigation.

Thus far in the review of the objective self-awareness literature there have been no serious questions directly raised by any particular research effort regarding the order of occurrence of the two motivational consequences of self-focus. To reiterate, in their early work, Duval and Wicklund (1972) were not explicit regarding whether the avoidance reaction or discrepancy reduction reaction would occur first. However, they suggested that the discrepancy reduction response will be chosen if the discrepancy seems reducible, and the avoidance response if the discrepancy appears inflexible to change. In a later statement, Wicklund (1978) postulated that the primary response to self-focused attention in the face of a negative discrepancy will be the avoidance of self-focusing stimuli and/or attempts to distract oneself. If self-focus is impossible to escape from however, the individual will make efforts to reduce the discrepancy.

A number of studies have recently investigated the issue of strategy choice determinants. In a recent study by Carver, Blaney and Scheier (1979a), subjects approached a feared object (a non-poisonous snake) under mirror and non-mirror conditions. From self-reports it was found that self-awareness increased anxiety. However, self-focus did not directly influence behavioral outcome. Rather, self-focus interacted with premeasured confidence in feeling able to cope with the affect

associated with approaching the feared object. Confident subjects engaged in discrepancy reduction behavior by continuing to approach under self-focus conditions, while doubtful subjects avoided by withdrawing earlier in the approach. Thus, the chosen strategy in this study seemed to be determined more by fear-coping confidence than by increases in self-focus.

In a second study by Carver, Blaney and Scheier (1979b), outcome expectancy was manipulated rather than measured. Subjects were given an anagram task to solve, followed by failure performance feedback. Some subjects were led to believe that they would do well on a subsequent task while other subjects were led to expect a second poor performance. During the second task, some subjects performed in the presence of a mirror and some without a mirror. As predicted, subjects with positive expectancies showed greater persistence in the self-focus rather than non self-focus condition, while the opposite pattern was noted for the negative expectancy groups.

Once again, the strategy choice assumption as presented by Duval and Wicklund has been challenged. Had the subjects in the preceding study wished to avoid the task, they could have done so by finishing quickly and exiting the room. These results, in conjunction with those of the first study by the same authors, strongly suggest that "expectancy" is prepotent as a behavioral determinant over the presumed affectively aversive results of self-focus.

In a study by McDonald (1980), subjects were given either positive or negative feedback on a bogus creativity task. Following feedback,

subjects were asked to write as much as possible about a Thematic Apperception Test card. Half of the subjects responded under self-focus conditions and the remainder without self-focus. Outcomes indicated that with a mirror present, subjects wrote more after receiving negative than positive feedback. This finding is contrary to Wicklund's (1978) theorizing. That is, according to Wicklund, avoidance would have been the primary response following negative feedback. However, in favor of Wicklund's argument, it could be said that an increase in written output reflects a distraction strategy to avoid objective self-awareness stimuli. On the other hand, if avoidance of objective self-awareness was the intention it seems that a less effortful route would have been chosen (e.g., finishing the essay quickly and leaving the field).

Steenbarger and Aderman (1979) manipulated performance expectancy more directly than the last study by explicitly informing subjects that improvements were or were not possible on a second performance attempt. In particular, subjects were presented with negative feedback on a speech performance. Some subjects were led to believe that improvements could be made on a subsequent performance while others were told that improvement was unlikely. Subjects then completed mood and self-evaluation questionnaires under either self-focus or non self-focus conditions. The results indicated that under self-awareness conditions, the negative affect reported was significantly higher in the "nonimprovement" rather than in the "improvement" condition. Furthermore, self-aware subjects who were led to believe that improvement was unlikely, spent less time in the situation than both

self-aware subjects who believed that improvement was possible and low self-aware subjects in "improvement" and "nonimprovement" conditions. That is, when the likelihood of performance improvement was small, self-aware subjects had a greater tendency to avoid the situation than to attempt discrepancy reduction.

In summary, the results of the four preceding studies provide strong evidence that discrepancy reduction will be chosen under certain conditions as the primary response to self-focus. In each of the studies both avoidance and discrepancy reduction were possible reactions. In contrast to this, a number of earlier studies created situations which precluded discrepancy reduction. An example of the latter type of research is the study by Duval, Wicklund and Fine (1972), previously discussed in an earlier section. As may be recalled, the trait in question was relatively fixed in nature. Furthermore, no chances were offered to the subjects to even attempt discrepancy reduction. Thus it comes as no surprise that with increased self-focus, faster withdrawal from the situation was the strategy employed. Similarly in the studies by Davis and Brock (1975) and Greenberg and Musham (1981), no opportunity was provided to reduce negative discrepancies resulting from failure feedback, and thus the ensuing reaction was avoidance.

#### Self-Consciousness Theory

The preceding discussion has included Duval and Wicklund's objective self-awareness theory and the research which it has generated.

The situations where this theory has been applied are predominantly those where intraself discrepancies are presumed to exist. To reiterate, an intraself discrepancy is characterized by a state where the individual observes an internal contradiction or lack of congruence between the present actuality of the self and some standard, belief, or goal. In the following discussion, some of the studies already reviewed will be reexamined from another theoretical perspective which includes individual differences in self-attention tendencies. The discussion will further include studies which have investigated self-focus effects on self-aspects other than standards, beliefs or goals.

The work of Arnold Buss and several of his students forms the major part of the theoretical framework for the majority of the studies discussed in the following sections. Buss (1980) has extended the self-awareness area in two ways. First, self-focused attention has been conceptually dichotomized into private and public self-aspects. Secondly, these two types of self-focus are presumed to exist as general dispositional tendencies, and to be inducible by different varieties of self-focusing stimuli. The formulations concerning the private and public dimensions of self-focus in both a situational and dispositional sense, form what Buss has called "self-consciousness theory". The subsequent discussion of this theory, in conformance with Buss' terminology, will refer to the dispositional aspects as self-consciousness and to the situational aspects as self-awareness.

The following presentation will be divided into two main sections, each of which will be split into two subsections. The first section

focuses on the public aspects and is subsectioned into a theoretical exposition and a review of relevant research findings. The second and most germane section to the present project, consists of a similar treatment of the private dimension. Each of the main sections on private and public aspects will include representative research on dispositional tendencies as well as the situational manipulations which correspond to the private/public distinction. At the beginning of both the public and private self-focus sections, a number of previously discussed studies will be reexamined according to self-consciousness theory. Following this reexamination, further replications of these studies which have employed dispositional distinctions will be presented.

Prior to a treatment of the private and public aspects of self-focus, several points should be discussed before proceeding further. In 1975, Fenigstein, Scheier, and Buss developed a scale with the intent to measure the contents of self-consciousness. From an original 38 items, factor analysis reduced the questionnaire to the present 23 items which represent three underlying factors: private self-consciousness, public self-consciousness, and social anxiety. The first two factors bear a moderate correlation to one another (.30), and are the primary factors described in the following discussion. At a general level, people who pay attention to self-aspects score above the mean on both the public and private dimensions. However, the moderate correlation suggests that these dimension are measuring different self-aspects.

The traits of public and private self-consciousness, as already briefly mentioned, represent chronic tendencies or dispositions to focus on certain self-aspects. The phenomenological states and consequent behavior corresponding to scoring at the high end of the private and public dimensions, are considered similar to those temporary states of private and public self-awareness elicited by exposure to different classes of self-focusing stimuli. Historically, the dispositional aspects of Buss' work both at the theoretical and empirical level, precedes the situational formulations. In fact, research in the area of dispositional self-focus provided the impetus for an exploration of the types of stimuli which may induce public and private self-awareness.

Assuming that a particular state of awareness has been activated, a question arises regarding its degree of dominance over time. Theoretically, it is assumed that one may move from one state to another over a short span of time. However, as was the case with objective self-awareness and subjective self-awareness (Duval & Wicklund, 1972), the public or private state is presumed to be predominant at a particular point in time. But unlike the objective self-awareness case where the presence of one state precludes the other, Buss makes no definitive statements regarding the mutually exclusive occurrence of the public and private states. Logically it seems that it would be easier to concurrently maintain an awareness of different types of self-aspects (public or private) than to sustain a concurrent awareness of self-aspects and the external environment (i.e., objective self-awareness and subjective self-awareness respectively). However, in

the practical interest of testing the theory, Buss assumes that one state of awareness will dominate as a joint function of where the individual lies on the trait dimension and the strength of the environmental inducers. The domination of one awareness state over another is defined by the contents of consciousness. That is, each state is characterized by attention to the different self-aspects to be discussed in the following sections.

### Public Self-Focus: Trait and State

#### Theory

The public self-focused state is assumed to take place under two stimulus conditions. First, exposure to a large mirror, and video or audio feedback (are considered sufficient conditions to induce public self-awareness. The second stimulus condition involves being monitored by an audience either directly or indirectly by means of recording devices. The result of the first set of conditions, according to Buss (1980), is generally a feeling of not matching up to one's usual self-image with a consequent temporary drop in self-esteem. The second two inducing conditions, observation by an audience or by monitoring devices, usually lead to a certain degree of anxiety. The anxiety associated with being observed is typically less intense when the "observer" is a recording device as opposed to a live audience. Thus, both socially and non-socially induced public self-awareness are

generally accompanied by a degree of negative affect. However, the intensity of the negative affect is usually higher in the social situation. In the extreme case, public self-awareness leads to social anxiety. A third, but generally weaker self-produced public self-awareness may result from a fantasized social situation. This type of vicarious public self-awareness would theoretically only occur in those individuals at the high end of the personality dimension of public self-consciousness.

The cognitive content of the publicly self-aware state includes all those aspects of the self which are potentially visible to others. One's physical appearance and observable behaviors fall within this category. The process implied by this state seems to involve a kind of distantiation from oneself and a subsequent observation of the self as if one were another individual. The theory does not suggest that this is a process akin to empathy. That is, taking the perspective of a particular other in viewing oneself is not presumed. Rather, the process is assumed to stay within the boundaries of the individual's own subjectivity. Although an attempt to adopt another's perspective in viewing oneself is a sufficient condition to induce public self-awareness, it is not a necessary one. Theoretically, public self-awareness should occur when one objectifies the self on personal dimensions which are typically accessible to public scrutiny.

The dispositional tendency to be publicly self-aware has been called public self-consciousness by Buss. Those who are high on this dimension have an enduring propensity to engage in cognitions related to

their social object status. However, the distinction between high and low publicly self-conscious people usually becomes evident only in the presence of those stimuli which elicit public self-awareness. That is, those high on the dispositional dimension are more susceptible to the induction of the public self-awareness state than those at the low end of the dimension. The concern over one's social object status emanates not necessarily from an established negative view of one's appearance and/or behavior. This tendency arises, contends Buss, from a lack of certainty as to how these self-aspects are perceived by others. As a result of this ambiguity, the high publicly self-conscious individual typically compares self-perceptions with internalized social standards on a regular basis.

### Research

In this section, selected aspects of some previously discussed studies will be reexamined from the perspective of self-consciousness theory. Following a discussion of some of these studies, recent research attempts to replicate the results of these same studies using dispositional differences will be presented. Finally, several other representative studies of public self-awareness in the areas of information processing, physical appearance, perspective taking and social interaction will be presented.

The study by Ickes, Wicklund and Ferris (1973) measured self-esteem changes with two types of self-focusing stimuli. In one experiment,

subjects completed a real/ideal-self questionnaire with or without a recording of their own voices. According to self-consciousness theory, this type of stimulus should lead to public self-awareness and a consequent drop in self-esteem. The results were consistent with this prediction.

Another experiment by these authors, discussed previously in the section on self-evaluation, used a mirror to induce self-focus in a situation where self-esteem was measured after subjects received performance feedback. A drop in self-esteem was again noted. It is unclear however, whether or not this result is consistent with self-consciousness theory. Buss (1980) maintains that a mirror will have different effects depending on its size. Theoretically, if the mirror provides an entire body reflection, it will lead to public self-awareness while private self-awareness will follow from exposure to a small mirror. The results of the experiment (i.e., a drop in self-esteem) suggest that public self-awareness was induced. On the other hand, if private self-awareness has been present, self-esteem should have been unaffected. However, since the authors do not give the specific details of the mirror's dimensions, no definitive conclusions can be drawn.

A second study of self-esteem by Ferris and Wicklund (Wicklund, 1978, p. 474) provides further post hoc support for the validity of the public self-awareness concept. Subjects were asked to examine objects (rugs) and rate how they felt about themselves on a like-dislike scale. While making these ratings, subjects either watched a video feedback of

themselves or other visual patterns. As would be predicted by self-consciousness theory, subjects viewing their own video images indicated lower self-liking scores than subjects viewing other patterns.

In summary, both of the preceding studies utilizing video and audio feedback technology yielded results consistent with self-consciousness theory. That is, both of these induction methods showed results theoretically in accordance with the public self-awareness dimension.

The objective self-awareness research on cognitive dissonance may also be considered in the light of self-consciousness theory. In a situation where individuals are requested to behave counter to expressed attitudes, the theory suggests two possible outcomes, depending on the type of self-focus. In the state of private self-focus, the theory predicts an increase in awareness of internal events. This higher awareness of internal events, in this case attitudes, may increase resistance to attitude change following counterattitudinal behavior. On the other hand, in a state of public self-focus in which the individual becomes more aware of overtly observable aspects of the self, the counterattitudinal behavior should become more salient than the initial attitudes. This behavioral salience should then lead to a corresponding attitude change.

In a study by Wicklund and Duval (1971), previously discussed in the discrepancy reduction section, a video camera was used to induce self-awareness while subjects copied counterattitudinal speeches. The subjects (students) were led to believe that the recordings would be viewed at a later date by an audience (professors). As predicted by

Wicklund and Duval, subjects exposed to a camera moved to a position more congruent with their counterattitudinal speeches. These findings are in line with self-consciousness theory, in that the presence of a video recording device is assumed to elicit attention to overt self-aspects. In the present situation, this means that subjects would be expected to focus more on the counterattitudinal behavior than on the previously stated attitudes. As mentioned earlier, the study by Insko, Worchel, Songer, and Arnold (1973) found similar results in a dissonance situation with camera manipulated self-focus.

In a more recent study by Scheier and Carver (1980), the self-consciousness theoretical issues are directly addressed in a dissonance paradigm. In the first of their studies, results contrary to the two preceding experiments were found. That is, exposure to self-focusing stimuli in this case did not lead to attitude change. The authors concluded that the different effects may have been due to the use of a mirror rather than video technology as a self-awareness manipulation. That is, a small mirror (as used in this study) is theoretically assumed to induce private self-awareness, which would more likely lead to a focus on previously stated attitudes rather than overt behavior (i.e., essay writing).

A second experiment by the same authors further investigated this discrepancy of results by including a mirror and camera condition in a dissonance situation. They found that a mirror did not lead to attitude change, but was associated with subjects' perception of their behavior as less counterattitudinal than it really was. On the other hand, the

presence of a video camera did result in greater attitude-behavior correspondence, as found in the aforementioned dissonance studies.

In the third experiment of this dissonance study, Scheier and Carver formed groups according to attentional dispositions. As predicted, and parallel to the results of the situational self-focus manipulations, subjects high in public self-consciousness and low in private self-consciousness changed their attitudes following counterattitudinal behavior. On the other hand, subjects high in private self-consciousness and low in public self-consciousness apparently reduced dissonance by distorting their perception of their behavior in such a way as to view it as less counterattitudinal.

The three aforementioned studies (Insko, Worchel, Songer, & Arnold, 1973; Scheier & Carver, 1980; Wicklund & Duval, 1971) provide evidence in support of differential effects of a camera and a mirror as self-focusing stimuli. The study by Scheier and Carver (1980) strongly suggests a parallel between dispositional tendencies and situational manipulations of self-focus, thus providing evidence in support of the theoretically presumed underlying self-attentional dichotomy.

In the area of conformity, the public self-focus dimension is relevant to a self-consciousness theory interpretation. In a study by Duval (1976), subjects were given bogus feedback regarding the proportion of a peer group who were in agreement with them on certain attitudes. Subjects were then placed in a situation with presumably two other people who gave conflicting estimates of the number of objects projected onto a screen. Half of the subjects were exposed to their

video image during the estimation task, while the other half viewed a black screen. The results indicated that those subjects in the camera condition (especially those with unpopular attitudinal positions) had the highest degree of conformity on the perceptual estimation task. These findings are what would have been expected from a self-consciousness theory interpretation. That is, the presence of a camera elicits public self-awareness, which theoretically implies increased compliance.

A recent study by Froming and Carver (1981) investigated dispositional differences in conformity. Subjects were placed in a group setting and asked to estimate the number of clicks delivered through headphones. Group pressure was exerted by means of bogus estimations which were at variance with the subject's estimates. The experimental findings showed an inverse relationship between private self-consciousness and conformity. This result is consistent with theory in that greater awareness of internal events is assumed to occur in individuals at the high end of this dimension. In this case the internal events were the subject's perceptions, which proved prepotent over group pressure. The effects of public self-consciousness were also in the expected direction. That is, those subjects high in public self-consciousness displayed more compliance than those at the low end of the scale. This study, in addition to replicating Duval's (1976) experimental results at a dispositional level, provides evidence that public and private self-consciousness may lead to opposite behavioral results within the same phenomenon.

Further parallels between situational and dispositional self-focus have been demonstrated in the area of reactance. Reactance is a term which has been used to refer to the motivational state which occurs when an individual's freedom is threatened or taken away (Brehm, 1966). The behavior following reactance is directed towards regaining the threatened freedom. Thus in a situation where a forceful agent tries to inhibit one's actions or threaten one's beliefs, there may be a reaction to resist or act contrary to this perceived threatening source. The relationship between reactance and self-focused attention was first investigated by Carver (1977). The results indicated that subjects exposed to a mirror in a freedom threatening situation perceived higher coerciveness from the influencing source than non-mirror subjects. A second experiment by the same authors showed that self-focused subjects were more resistant to a freedom threatening source than non self-focused subjects.

A recent study by Carver and Scheier (1981a) on dispositional differences used the same paradigm as in the preceding reactance experiments. Subjects were presented with a moderately or forcefully persuasive communication regarding the choice of a political candidate. Prior to this communication, subjects were given a description of and asked to express their degree of support for the candidate. Subsequent to the communication manipulation, subjects received a duplicate opinion survey.

The results indicated no reactance to a high threat communication in high publicly self-conscious subjects, while those low on the

dimension did show a reactance response. This pattern of results is consistent with self-consciousness theory in that high public self-conscious individuals should theoretically have shown an inhibition of reactance responses because of a higher awareness of their status in a social context. In contrast to the public dimension, subjects high in private self-consciousness displayed more reactance than those low on the dimension. This latter finding is of interest with respect to providing more evidence of a common underlying factor to the dispositional and situational manipulation of private self-focus. That is, both high private self-consciousness and exposure to a mirror led to high reactance responses. This is consistent with theoretical expectations in that private self-focus should have resulted in a higher awareness of the negative affect accompanying a freedom threatening situation. It would have been interesting to see if a manipulation of the state of public self-awareness would yield results similar to the trait of public self-consciousness.

In the area of information processing, Turner, Gilliland, and Klein (1981) predicted a relationship between processing speed and public self-consciousness. In particular, they hypothesized that information related to visible self-aspects would be processed at a higher speed in high rather than low publicly self-conscious individuals. The rationale for this hypothesis was that those high in public self-consciousness should have more self-schemata associated with the overt self. Subjects were given slides listing physical characteristics and asked to press a button signaling like or dislike of these characteristics in themselves.

As predicted, those high in public self-consciousness made faster judgements than those low on the dimension. No relationship was found between processing speed and private self-consciousness.

Two recent studies have explored the relationship between public self-consciousness, makeup use and clothing. Miller and Cox (1982) found, in conformity with self-consciousness theory, that those women in the study who were high in public self-consciousness tended to use more makeup than those low on the scale and believed that the use of makeup facilitates smooth social interactions. Private self-consciousness was found to be unrelated to makeup. The second related study concerning physical appearance examined public self-consciousness in relation to feelings about fashion and clothing. Solomon and Schopler (1982) found that high public self-consciousness subjects showed a consistently higher interest and focus on clothing than the low public self-consciousness individuals. Surprisingly, these researchers found that males showed a significantly higher relationship between these two variables than did females. The authors suggest that this sex related difference may be due to the use of clothing by males for strategic purposes in self-presentation, in contrast to the cultural use of clothing by females as a symbol of self-worth. The two aforementioned studies both demonstrate that the public self-consciousness scale is related to concern over physical appearance and that this concern is not only related to responding to situations but is also germane to preparatory measures taken in anticipation of particular social situations.

The next study on public self-consciousness examined whether this scale was related to accuracy in predicting the impressions made on others. Tobey and Tunnell (1981) videotaped female subjects and then asked them to predict how they would impress possible viewers. As may be expected to follow from a higher awareness of oneself as a social object, high in contrast to low public self-consciousness subjects were significantly more accurate in their predictions of how independent judges would rate them on an activity, potency and evaluation factors (semantic differential). However, these high public self-consciousness subjects made no better impressions than low scoring people. Thus, being knowledgeable about one's impact on others does not mean that one is capable of making a favorable self-presentation.

The final study related to self-presentation and self-definition issues explored self-consciousness in relation to social and personal identity. Cheek and Briggs (1982) administered social and personal identity items (Sampson, 1978) and the Self-Consciousness Scale to subjects. Consistent with the three aforementioned studies, public self-consciousness was found to be more strongly associated with social than with personal identity aspects. The reverse pattern was noted for private self-consciousness. This study, in addition to further validating the public self-consciousness scale, also provides further evidence that public and private self-consciousness are distinct constructs.

The next study representative of public self-consciousness involves its influence in a rejecting social interaction. Fenigstein (1979)

hypothesized that high publicly self-conscious people would show greater reactivity to group rejection and assume more personal responsibility for the rejection than those low in public self-consciousness. Following a social rejection experience, subjects completed a questionnaire regarding their degree of interest in remaining with the same group for a second part of the experiment, as well as their liking or disliking for the group. As predicted, subjects high in public self-consciousness were less interested in a continuing association with the rejecting group than were low public self-consciousness subjects. Furthermore high publicly self-conscious subjects showed less liking for the group than did those subjects low on the scale. Finally, high rather than low public self-consciousness subjects made the most self-attributions regarding reasons for rejection. The effects of private self-consciousness in this study were minimal.

A second experiment of the preceding study is interesting in that a mirror was found to yield results in a social context suggesting that public self-awareness had been induced. The situation involved evaluation by an interviewer. After receiving bogus feedback on a personality measure, subjects rated the interview and interviewer on likeability scales. The likeability scores were found to be lowest with a mirror present in the negative feedback condition. This result was interpreted by the authors as a demonstration of mirror induced public self-awareness. Buss (1980) however, disagrees with this conclusion, and on the contrary feels that the findings are a consequence of the affective polarization occurring with private self-awareness. Because of

the presence of both a mirror and an evaluating other, it is unclear which kind of awareness was in fact induced.

The last study concerning the public dimension is interesting in that the public self-consciousness and public self-awareness dimensions are crossed within the same experiment. Hass (1984) asked some subjects to draw an "E" on their foreheads in the presence of a functioning tape recorder, while the remaining subjects completed the same task without the tape recorder present. It was noted that both high and low public self-consciousness subjects displayed a significantly greater external perspective orientation in the presence of the recorder than those without a recorder present. On the other hand the high versus low public self-consciousness distinction only showed a difference in perspective taking in the low public self-awareness condition (i.e., without a tape recorder). That is, the high public self-consciousness subjects showed a greater degree of external perspective taking than the low public self-consciousness subjects without the recorder present. This finding is somewhat surprising since according to self-consciousness theory, public self-consciousness should only be activated in the presence of a public self-awareness inducer. It may be argued however, that the instruction related verbal communication occurring between the experimenter and subject just prior to the drawing task induced a certain degree of public self-awareness. This induction was most significantly effective with those high on public self-consciousness. No significant difference was found in external perspective taking between high and low public self-consciousness in the presence of the tape

recorder. This may have been due to a ceiling effect of the recorder presence, which could mask different response patterns between high and low public self-consciousness subjects. This study did not test whether similar effects would be obtained with a private self-awareness manipulation, but did establish that no relationship existed between the private self-consciousness dimension and perspective taking.

In summary, a relatively small number of studies have investigated public self-focus both at a dispositional and situational level. The present discussion included a post hoc examination of self-awareness studies conducted prior to the conceptual distinction between private and public self-awareness. Following some of these studies, replications were presented in which the effects of public self-focus were investigated and demonstrated at dispositional and situational levels. Finally, several studies in the areas of information-processing, physical appearance, perspective taking, and social interaction provided more support for the private/public self-focus distinction, and evidence of construct validity for the public self-consciousness scale. The studies by Fenigstein (1979) and Hass (1984) have investigated and found support for the theoretical assumption of an interaction between public self-awareness and public self-consciousness. That is, in the Fenigstein (1979) study, those high in public self-consciousness reacted more to social rejection than those low on the scale, while in the Hass (1984) study, a difference in responding was noted between those low in public self-consciousness as a result of public self-awareness manipulations. Although the trait by state interaction in the Hass study is not what is

theoretically expected (i.e., high public self-consciousness individuals should react more strongly to public self-awareness inducers than those low on the dimension), the reasons for this apparent discrepancy with the Fenigstein study are not clear. The two studies used different response measures and different types of public self-awareness inducers. In the Hass study, public self-awareness was induced by an audio recording while the Fenigstein study relied on social acceptance and rejection to manipulate the dimension. The present state of the research offers little information regarding response pattern peculiarities which may exist between different types of public self-awareness inducers. Although fewer studies have been conducted in the public as opposed to the private aspects of self-focus, the available evidence does provide empirical support for both the dispositional and situational components of this construct.

#### Private Self-Focus: Trait and State

##### Theory

At the dispositional level, private self-consciousness implies a tendency to attend to personal and internal aspects of the self. Those individuals high on the dimension are considered to have a high awareness of internal events such as physical sensations, affects, and cognitions. They have a penchant for introspection and have covert self-aspects as a focal point of much of their thinking. The result of

this orientation is presumably more self-knowledge than those at the low end of the dimension. That is, high private self-consciousness people's self-descriptions tend to be more complete and of higher veridicality than the lows.

In addition to greater self-knowledge, the theory holds that high private self-consciousness individuals have a tendency to exaggerate the intensity of affectively laden experience. For example, emotions, sensations and motives are hypothesized to be experienced more intensely by those high on the dimension. In contrast, those low on this trait generally experience no exaggeration of internal experiences. In brief, the two primary consequences of high rather than low private self-consciousness are an intensification of affectively colored internal experiences and a clarification of all internal events. Neutral internal experiences, although theoretically assumed to increase in distinctiveness and clarity with private self-focus, are not considered to increase in intensity.

Regarding situationally induced private self-awareness, Buss holds that it may be of internal or external origin. That is, a person may voluntarily focus on internal self-aspects with no apparent external elicitors. On the other hand certain external stimuli increase the probability that private self-focus will occur. Thus, in contrast to Duval and Wicklund's (1972) objective self-awareness theory which postulates that external stimuli determine attentional direction, Buss maintains that public and private self-focus may occur with or without external stimuli. Certain activities which require one to examine

internal events (e.g., some forms of meditation) are instances of self-produced private self-awareness.

The only external stimulus which, according to the theory, leads to private self-awareness is a small shaving size mirror providing a reflection of the face. Buss argues that facial reflection is more likely to lead to an inspection of private rather than public self-aspects due to the relatively unchanging nature of one's physiognomy. In contrast, a full length three-section mirror reflection is considered to induce public self-awareness because of its similarity to the view others have of us.

It is noteworthy that Buss (1980) speculated on the likelihood of an interaction effect of private self-focus states and traits. He predicted that a private self-awareness induction would most likely affect people high and low on the dimension to an equal degree. Buss considered both a ceiling effect and an increased susceptibility to internal focusing stimuli to be less likely interaction possibilities. That is, those high in private self-consciousness are not likely to be so internally oriented that they are insensitive to further increases in private self-awareness. On the other hand, it is also unlikely that high private self-consciousness individuals are especially sensitive to inducing stimuli (i.e., require such stimuli to become privately self-aware) since they are capable of internal focusing in the absence of external stimuli.

## Research

The studies presented in this section are divided into two primary subsections. The first subsection includes research illustrating the assumption of increased distinctiveness and clarity with private self-focus. The second subsection deals with the assumption that private self-focus leads to a higher affective valence on those internal events which already carry an affective value. Each of these subsections will be composed of both situational and dispositional investigations. Prior to these discussions, several studies of situational manipulations of self-attention as well as attempted replications at the dispositional level will be presented. Some of the studies to be reviewed have already been discussed in previous sections. These studies precede those under the rubrics of self-aspect clarification and intensification, since they provide validity evidence more directly related to the private self-focus construct.

In the study by Davis and Brock (1975) a mirror was used in one experiment and a camera in another to induce objective self-awareness. The results suggested increased self-focus with both a mirror and a camera. According to self-consciousness theory, a mirror and a camera should induce private and public self-awareness respectively. It is difficult however, to conclude that no differential effects occurred as a result of the camera and mirror due to the asymmetry of the experimental design. The first part of this study employed a camera to induce self-awareness with positive, negative and no feedback conditions

regarding competency on a bogus test. In the second experiment where a mirror was used, the no-feedback condition was omitted. Thus the effects of the mirror were contaminated with feedback. From a theoretical standpoint, it may be that since no standards were made explicit in this experiment, private and public self-awareness manipulations would have yielded similar results. However, this latter possibility can neither be confirmed nor ruled out due to the aforementioned design problems.

In a second study by Carver and Scheier (1978) self-focusing effects were again addressed using Exner's Self-Focus Sentence Completion Blank (1973). In this case the mirror condition was used in a no-feedback situation, which resulted in a greater proportion of self-focus responses as opposed to the non-mirror condition. Furthermore, a significant relationship was found between private self-consciousness and self-focus while no such relationship occurred with public self-consciousness. Of theoretical interest is the finding that only those subjects low in private self-consciousness were affected by the mirror. That is, a ceiling effect may have been operating such that high private self-consciousness subjects were not subject to further increases in self-attention by means of a mirror. According to Buss (1980) this was one of the less likely interaction patterns. The authors point out that the ceiling effect could have been due to the self-focus measure, which may itself have led to increased self-attention.

In a second part of the study, Carver and Scheier used the same self-focus measure with an audience present. The results indicated an

increase in self-attention. This is interesting in that no such significant increase was noted with dispositional public self-consciousness in the first experiment. Although the authors did not deal with this apparent contradiction, it may be explained as a result of the types of inducers used in the first and second part of the study. In the first experiment a mirror was used to induce self-focus, which according to self-consciousness theory, would not elicit attention to public self-aspects regardless of where an individual lies on the public self-consciousness dimension. Thus, it is not surprising that public self-consciousness shows little relationship to the self-focus index in the first experiment.

The experiments in this study suggest that both the private and public self-aspects are measurable by, but not clearly discriminated by, the Self-Focus Sentence Completion Blank. The primary relevance of this study to the present discussion was the demonstration of parallel effects of situational and dispositional private self-focus.

The next two studies used attributions of causality to the self as a measure of self-focus. In the first study by Duval and Wicklund (1973), already discussed in an earlier section, subjects were asked to assign a degree of responsibility for the outcome in a number of hypothetical situations. Some subjects filled out a questionnaire measuring self-attributions in the presence of a full length mirror, while others did so with no mirror present. Those in the mirror condition made significantly more self-attributions than the control subjects.

In a replication of the preceding study by Duval and Wicklund, Buss and Scheier (1976) found that the presence of a mirror increased self-attributions, but that the mirror/no mirror difference was not significant. Subjects were grouped according to high and low private self-consciousness. The results showed significantly more self-attributions for high private self-consciousness subjects. A further analysis indicated no relationship between public self-consciousness and attributions.

Due to the lack of specificity regarding mirror size in Buss and Scheier's study, this failure to replicate Duval and Wicklund's mirror induced-awareness results, is difficult to assess. Furthermore, since public self-consciousness is usually only elicited by specific types of stimuli, the failure to find a relationship between public self-consciousness and self-attributions would have been expected if a small mirror had been used (i.e., a private self-awareness inducer). However, if a public self-awareness inducer had been employed in this study (e.g., a full length mirror or video-recorder) public self-consciousness may have had an effect. Regardless of the aforementioned interpretive difficulties, this study shows clear self-focus differences between high and low private self-consciousness.

In summary the preceding four studies have presented supportive evidence with regard to private self-focus situational manipulations. The effects of dispositional private self-consciousness were also significant in the expected direction (Buss & Scheier, 1976; Carver & Scheier, 1978). Public self-consciousness consistently showed no effects

in the replication studies, which may have resulted from a lack of public self-awareness inducers. However, situational private and public self-focus manipulations resulted in significant effects in the self-orientation studies (Carver & Scheier, 1978; Davis & Brock, 1975). This latter finding suggests that in this type of situation, neither private nor public self-focus appears to be operating to the exclusion of the other. It seems that rather than eliciting behaviors associated with the private or public self, the behavioral measure used was associated with a more undifferentiated self, regardless of the type of induced self-focus.

As a final example of a parallel between private self-awareness and private self-consciousness, Scheier and Carver (1982) recently replicated the study by Carver, Blaney, and Scheier (1979b). Scheier and Carver administered a concealed figures test to subjects followed by either success or failure feedback. A second test was administered and presented as closely related to the first test regarding performance outcome. It was predicted that there would be a self-consciousness by expectancy interaction such that high private self-consciousness subjects who had been given success feedback would show greater persistence than those in the failure feedback condition. No such differences were expected in the low private self-consciousness condition. The results confirmed these predictions and thus provide further support for the postulated analogous relationship between private self-awareness manipulations and dispositional private self-consciousness.

### Self-aspect clarification

The self-aspect clarification assumption of self-consciousness theory implies that internal events become more salient in the privately self-focused state. It follows that exposure to a private self-awareness inducer such as a small mirror should result in greater attention to behavioral attitudes or norms. As previously discussed from an objective self-awareness theoretical perspective, several studies have demonstrated self-awareness effects on aggressive behavior. From a self-consciousness theoretical framework the results of the same studies may be seen as examples of the clarification process.

In the study by Scheier, Fenigstein, and Buss (1974), men showed less aggression towards women in the presence of a mirror. The same effect was noted with an audience induced self-awareness. In a study by Carver (1974) where subjects were led to believe that aggressivity was appropriate, mirror exposure resulted in significantly higher aggression levels. A related study demonstrated a higher correspondence between attitudes toward aggression and aggressive behavior in the presence of a mirror (Carver, 1975). In a no-mirror condition, aggression related attitudes and aggression were uncorrelated.

The preceding three studies are consistent with self-consciousness theory in that mirror presence led to behavior suggesting increased awareness, or clarification of internal self-aspects. That is, behavioral standards (whether culturally normative, personal or

experimenter induced) were presumably focused on and thus made more clear. This increased clarity should, according to the theory, have resulted in the observed standard-behavior congruencies. As discussed earlier, objective self-awareness theoretical predictions were also consistent with the results of the preceding three aggression studies. However, rather than postulating a self-evaluation process and the consequent negative affect, self-consciousness theory only assumes a greater knowledge of internal events.

In a more recent study, Scheier, Buss, and Buss (1978) asked subjects to complete a self-report measure of aggressivity and the Self-Consciousness Scale. Subjects later participated in a situation similar to that of the previously discussed aggression studies. That is, punitive behavior by subjects was encouraged in their role as a teacher in a learning situation. High private self-consciousness subjects showed a higher correlation between self-rated aggression and punitiveness than those subjects low on the dimension. Public self-consciousness was unrelated to this self-report/behavior correlation.

Bernstein and Davis (1982) extended the investigation of self-report/behavior consistency to include the accuracy of observers ratings. Subjects were asked to match videotaped actors' behaviors in discussion group situations with their independently acquired self-descriptions. Actors were either high or low in private self-consciousness. The results showed that actors high in private self-consciousness were more easily matched with their self-descriptions than those actors low on the dimension. Public self-consciousness also

influenced the degree of observers' accuracy, but to a lesser extent than private self-consciousness. Those subjects low in public self-consciousness were more accurately matched with their self-descriptions than those high in public self-consciousness. This result appears to be congruent with the theoretical expectation that high public self-consciousness subjects' concern with social approval may decrease their self-description validity.


In summary, the five aforementioned studies demonstrated that high private self-focus, either at a dispositional or situational level, was associated with greater consistency between standards (whether externally introduced or personal) and behavior. The studies by Carver (1975) and Scheier, Buss, and Buss (1978) showed that situational and dispositional private self-focus led to increased correlations between self-reports and behavior. The last two studies by Scheier, Buss, and Buss (1978), and Bernstein and Davis (1982) provide evidence for the discriminant validity of the public and private self-consciousness dimensions.

The remaining two studies to be discussed in this section illustrate the clarification of internal physical events as a result of self-focus. In the first study by Gibbons, Carver, Scheier, and Hornuth (1979), it was hypothesized that a mirror induced self-awareness would decrease susceptibility to the placebo effect. It was argued that when self-focused, subjects would be less likely to experience the expected placebo effects and more likely to make accurate self-assessments. Some subjects were given a placebo (bicarbonate of soda) and misinformed that

it was a drug with specific physiological effects. The remaining subjects were given the same dosage of the bicarbonate of soda in a correctly labeled package. Half of the subjects were exposed to a mirror during a learning task while the remaining subjects faced a non-reflective surface.

Consistent with the predictions, those subjects exposed to a mirror (i.e., private self-awareness) showed less symptoms of arousal than non-mirror subjects. Furthermore, subjects in the mirror condition who were led to expect specific ~~drug~~ reactions showed the greatest attributional differences from non-mirror subjects. That is, misinformed self-focused subjects attributed considerably less arousal to the placebo than did non self-focused subjects. It is of interest that the effect of self-awareness was specific to the expected symptoms and did not result in a general suppression of internal events; that is, subjects in the mirror condition reported no less drug-irrelevant symptoms than non-mirror subjects. In sum, the results suggest that self-awareness diminished the suggestibility effects of a placebo. According to a self-consciousness theory explanation, this reduced suggestibility probably followed from an increased clarity of internal events resulting from self-awareness.

The next study in this section also deals with suggestibility and self-focus. Scheier, Carver, and Gibbons (1979) divided male subjects into high and low private self-consciousness groups. Each of the self-consciousness groups was shown slides of nude females with normative information suggesting that the slides were either arousing or



non-arousing. Some of the subjects saw their mirror images during the inter-slide intervals while the remaining subjects did not. Subjects were asked to rate the arousal value of the slides according to how much bodily arousal effects were experienced. The results indicated that in the presence of a mirror, subjects tended to make less extreme ratings. Thus, those subjects in the arousal condition made lower arousal evaluations with a mirror present. On the other hand, subjects receiving a non-arousal set rated the slides as more arousing in the mirror condition. The authors concluded that self-aware subjects were less easily influenced by external information as a consequence of a more accurate examination of internal information. The arousal ratings of high privately self-conscious subjects, although in the same directions as mirror exposure subjects, were not significantly different from those low on the private self-consciousness dimension.

In a second part of this study, private self-consciousness was again investigated using a more direct measure of internal awareness. Subjects were given flavor intensity information of a liquid. Some subjects were led to expect a strong taste while others were led to expect a weak taste. It was hypothesized that subjects high in private self-consciousness would not be as easily influenced as those low in private self-consciousness. Furthermore, it was predicted that high private self-consciousness subjects would make more accurate ratings of the different intensity solutions presented. The results were consistent with both of these hypotheses.

A question arises as to why high and low private self-consciousness subjects yielded significantly different results in the outcome measure of the second experiment (taste intensity) while showing no differences in the first experiment (slide arousal). This may have been due to higher dependent measure sensitivity in the taste intensity experiment. That is, in the taste intensity experiment, the stimuli to be judged were varied in intensity from each subject's preestablished baseline rating. No baseline measures were taken in the slide arousal experiment.

In a recent study by Gibbons and Gaeddert (1984), the placebo effect was investigated from the point of view of utility. Subjects were given either a "performance facilitating" or "performance inhibiting" drug (placebo) and asked to work on an arithmetic task. It was predicted that in a non self-awareness situation, those subjects given the task interference "drug" would attribute greater arousal effects to the placebo than those subjects in the facilitating "drug" condition. This effect was expected as a result of an ego-enhancement motivation to appear more capable. Those subjects in a self-awareness condition (mirror presence) were expected not to show this self-serving behavior, but rather to act in conformance with actual arousal levels. The results confirmed these hypotheses and a second experiment was conducted without the possible evaluation-induced-arousal of a task, but with the previously mentioned placebo instructions. Subjects reported less of an effect as a result of both types of placebos.

The three preceding studies by Gibbons et al. (1979), Scheier et al. (1979), and Gibbons and Gaeddert (1984) presented evidence that

self-focus is an important factor in the clarification of bodily states and the accuracy of reporting those states. Furthermore, the clarification resulting from self-focus appeared to lead to a resistance to externally presented false expectancies regarding bodily sensations. In sum, these results are consistent with self-consciousness theory at a situational manipulation level in that a mirror (private self-awareness) led to a clarification of covert self-aspects. The second study by Scheier et al. (1979) partially supported self-consciousness theory by demonstrating internal awareness differences between high and low private self-consciousness in their second experiment. The third study by Gibbons and Gaeddert (1984) further demonstrated that placebo utility responses are susceptible to attenuation under self-focus conditions.

#### Self-aspect intensification

The second assumption of self-consciousness theory regarding private self-focus is the intensification of the affective valence of internal events as a result of attending to these events. This intensification applies only to events which already have an affective component. As already discussed, neutral internal events are not intensified by private self-focus. The studies reviewed in previous sections have primarily investigated situations where affect was low and an internalized directive or rule was assumed to mediate between self-focus and behavior. However, a number of studies have manipulated affect in self-focus situations.

Scheier (1976) hypothesized that strong affect would be prepotent over an internal standard in a self-focused state. Specifically, it was predicted that angered subjects would display more aggression when private self-focus was high. This increase in aggression was expected to occur whether private self-focus was dispositionally high or induced by a mirror. Subjects acted as a teacher in a learning situation where electric shocks were administered for wrong answers given by a confederate. Subjects were divided into mirror present and mirror absent groups. Half of the subjects in each of these groups were angered by the confederate prior to the learning situation. The results indicated that in the angered group, high rather than low private self-consciousness subjects delivered the highest shock intensities, and made higher post-experimental anger ratings. The same results were found for the mirror as opposed to no-mirror subjects. Public self-consciousness was found to be unrelated to aggression levels. Non-angered subjects did not become more punitive with a mirror present, nor was punitiveness associated with high private self-consciousness. It was thus concluded that greater awareness of affect rather than self-focus was responsible for increased aggression. To rule out the possibility that group differences were related to standards regarding aggression, subjects were measured on this variable prior to the main experimental procedure. No standard-behavior relationship was found, which suggests that affect overshadowed standards in this situation.

In sum, the study by Scheier (1976) demonstrated behavioral differences in a high affect context between high and low private

self-focus both at a situational and dispositional level. The results furthermore supported the private/public self-consciousness distinction. Finally, this study is the only research, relevant to the relationship between the state of private self-awareness and the trait of private self-consciousness. That is, the results showed increases in aggressive behavior in both high and low private self-consciousness subjects as a result of mirror presence.

Scheier and Carver (1977) extended the investigation of affect and self-focused attention. In a series of experiments, they measured the effects of situational and dispositional private self-focus on four different emotional states. In the first experiment male subjects made attractiveness ratings of slides of nude females. They were instructed to rate attractiveness according to bodily reaction experienced while viewing the slides. Some subjects were exposed to a reflective surface during the rating period between slides, while other subjects faced a non-reflective surface. Results showed that the mirror presence subjects rated the slide images as significantly more attractive than non-mirror subjects. The authors concluded that the higher attractiveness ratings in the presence of a mirror were due to a higher awareness of the emotions elicited by the slides.

In a second experiment of the same study by Scheier and Carver, subjects high and low in private self-consciousness viewed slides designed to induce positive or negative affect. Subjects rated the slides on a dimension of pleasantness-unpleasantness. As predicted, greater polarization of ratings occurred in high private

self-consciousness subjects. That is, the positive slides were rated more positively and the negative slides more negatively by high as compared to low private self-consciousness subjects. Public self-consciousness had no effect on the ratings.

A third and fourth experiment by Scheier and Carver (1977) investigated self-focus effects on affect more directly by using a mood-induction technique (Velten, 1968). In the first two experiments, the conclusion that affect changed as a result of self-focus could only be inferred from the slide ratings. In the third and fourth experiments however, the authors assumed a high correspondence between the induction procedure and the resulting affect. Affect ratings were made after the induction of elation or depression. Both situational (mirror presence) and dispositional manipulations of private self-focus were employed. The results indicated more extreme self-report mood measures in the presence of a mirror. Thus, depression subjects reported increased depression, while elation subjects reported increased elation in the mirror as compared to the no-mirror condition. These results were replicated for high private self-consciousness in the depression induction group. That is, high as compared to low private self-consciousness subjects indicated increased depression. Once again, public self-consciousness was found to be unrelated to mood ratings.

In sum, the experiments by Scheier and Carver (1977) provided support for the parallel effects of private self-awareness (situational) and private self-consciousness (dispositional). Furthermore, the results lend evidence to the discriminant validity of the private and public


dimensions. However, it should be noted that these experiments have certain methodological limitations. The first two experiments require an inference of affective intensification since external stimuli rather than direct affective changes were rated.

The last two experiments, although measuring affective changes more directly, have employed a questionable methodology to induce moods. Polivy (1981) has demonstrated that moods induced by the Velten (1968) procedure may be heavily laden with demand characteristics. She contends that the instructions prior to the mood statements may have as much of a mood inducing quality as the statements themselves. Furthermore, the induced moods as measured by the MAACL (Zuckerman & Lubin, 1965) dissipated quickly at an unknown rate. Thus, in the study by Scheier and Carver (1977), it is evident that mirror exposure and private self-consciousness influenced mood self-reports. However, it is unclear whether self-focus is acting on the mood statements, the demand characteristics in the instructions, or on the self-report questionnaire.

The next two studies to be discussed investigated the affect of fear under self-focus conditions. In a study by Carver, Blaney and Scheier (1979a), subjects approached a feared object (non-poisonous snake) with or without a mirror present. Subjects were divided into confident and doubtful groups regarding self-perceived ability to handle the snake. The distance of approach to the snake was recorded as well as self-reported affect (as inferred from bodily arousal) during the approach sequence. The results showed a main effect for mirror presence.

That is, mirror present subjects reported significantly higher anxiety than mirror absent subjects. However, behavior did not follow directly from these self-focus effects. Self-focus led to an earlier termination of the approach pattern among doubtful subjects, but not among confident subjects. This behavioral difference between doubtful and confident subjects may have been due to attentional contents during the approach task. That is, although both confident and doubtful subjects experienced an increase in fear during the approach, confident subjects reported focusing on goal attainment while doubtful subjects reported attending to bodily arousal. Thus, although the behavioral effects of mirror exposure (private self-awareness) are moderated by expectancies in this situation, all subjects showed an intensification of anxiety with private self-awareness.

In a study by Scheier, Carver and Gibbons (1981) fear intensity was varied in forming subject groups. In the first experiment, high and low fear subjects (with regard to handling a snake) performed the same approach task as in the Carver et al. (1979) study. A mirror was present for half of the subjects in each fear group and absent for the remaining subjects. It was predicted that high fear subjects would terminate the approach behavior earlier with a mirror present (private self-awareness) as compared to a no-mirror environment. This earlier withdrawal was presumed to follow from an increased salience of fear. Low fear subjects however, were expected to show a greater correspondence between approach behavior and the standard (i.e., handling the snake) in the presence of a mirror as compared to a no-mirror situation. This latter result was



expected due to the lower affect and consequent increase in standard salience. The results indicated that high fear subjects terminated the approach sequence earlier with a mirror present as compared to the no-mirror condition. Low fear subjects didn't show the expected effect with a mirror present. This latter finding was most likely due to the fact that all low fear subjects completed the approach task. A result of particular relevance to predicted intensification of affect with self-focus, is the failure to find changes in self-reported fear as a result of self-focus in the high fear group. This may have been due to a fear level high enough, so that no further increases were possible with self-focus (ceiling effect). A second possible explanation for no fear differences among high fear subjects is that mirror presence may have hastened clarification of fear rather than intensifying it. This earlier clarification and consequent withdrawal from the approach sequence may have precluded a further intensification of fear which may have occurred had the subject remained longer in the situation. Finally, the post-experimental affect questionnaire may not have been sensitive enough to measure small intensification changes.

A second experiment by Scheier et al. (1981) manipulated fear levels as opposed to making inferences of fear from self-reports, as was done in their first experiment. Subjects were divided into high and low private self-consciousness groups. Within each self-consciousness group, subjects were assigned to high and low fear conditions as defined by high or low electric shock expectation respectively. After receiving a description of the experiment, subjects were asked if they wished to

commit themselves as participants. It was predicted that high private self-consciousness subjects would be less likely to commit themselves in the high fear condition as compared to low private self-consciousness subjects. The reverse was expected when the fear was low. The results confirmed the behavioral predictions. The finding of most relevance regarding affect was the significantly higher fear reported by high private self-consciousness subjects who expected intense shock than reported by low private self-consciousness subjects. In the low shock group, no differences in reported fear were noted as a function of high and low private self-consciousness.

In summary both of the experiments by Scheier et al. (1981) suggest that when the affect of fear is strong, high private self-focus (situationally induced or dispositional) increased the likelihood that subjects would respond to the fear rather than to the task goals. The response to fear in these experiments was to avoid the threatening situation. The fear reports, as measured by the post-experimental questionnaires showed differences between high and low self-focus only in the second experiment. It is difficult to draw conclusions regarding this difference due to the non-comparability of the experimental designs. That is, experiment one involved a self-focus state manipulation while experiment two varied self-focus at a dispositional level. Although it appears that the disposition of private self-consciousness has psychological consequences similar to the private self-awareness manipulation, it has yet to be established whether both have the same degree of influence on behavior.

Considerable support for the private self-focus dimension has been found at both a situational and dispositional level. The first two studies discussed demonstrated similar behavioral effects for private and public self-focus as situational manipulations, as well as illustrating similar results for dispositional and situationally induced private self-focus (Carver & Scheier, 1978; Davis & Brock, 1975). The next two studies on attribution of responsibility again showed parallel effects of private self-awareness and private self-consciousness (Buss & Scheier, 1976; Duval & Wicklund, 1973).

Those studies in the self-clarification section provided considerable evidence that internal self-aspects become more salient when private self-awareness is induced and/or when private self-consciousness is high. This clarification effect held whether the internal aspects were behavioral standards (Carver, 1974; Carver, 1975; Scheier, Fenigstein & Buss, 1974) or the correct assessment of physical sensations (Gibbons et al., 1979; Scheier, Carver, & Gibbons, 1979).

In the studies reviewed where a salient affective component was introduced, intensification of affect was noted in most instances, both for private self-awareness and self-consciousness. These studies showed an intensification of anger (Scheier, 1976), elation, depression and perceived bodily arousal (Scheier & Carver, 1977) and fear (Carver, Blaney, & Scheier, 1979a; Scheier, Carver, & Gibbons, 1981).

### Criticisms and Conclusions

In closing this discussion of self-consciousness theory, several conclusions may be drawn. The finding receiving the greatest amount of empirical evidence is that supporting the distinction between private and public self-consciousness. However, in approximately half of the published studies consistent with this evidence, public self-awareness inducing stimuli were not employed (e.g., Buss & Scheier, 1976; Carver & Scheier, 1978; Scheier, 1976; Scheier, Buss, & Buss, 1978; Scheier, Carver, & Gibbons, 1981, Experiment 2). It is noteworthy that in most of the published studies without a public self-awareness inducer, with the exception of those researches concerned with identity and self-presentation (Cheek & Briggs, 1982; Miller & Cox, 1982; Solomon & Schopler, 1982), public self-consciousness was unrelated to the dependent variables in question. On the other hand, those studies which did reveal a relationship between public self-consciousness and the output measures included public self-awareness inducing stimuli seemingly inadvertently, since no acknowledgement of this inclusion is explicitly offered in those investigations (e.g., Carver & Scheier, 1981, Experiment 1; Froming & Carver, 1981; Scheier, Carver, & Gibbons, 1979; Turner, Gilliland, & Klein, 1981). These findings regarding the presence and absence of public self-awareness inducing stimuli are consistent with self-consciousness theory, yet raise a question with respect to those studies not including a public self-awareness inducer. That is, it is not surprising that public self-consciousness is

uncorrelated with the dependent measure when public self-awareness inducing stimuli are absent since it is theoretically postulated that public self-consciousness only becomes activated in the presence of such stimuli. However, it cannot be definitively stated that public self-consciousness would remain uninfluential if public self-awareness inducers were introduced into the studies in question.

Regarding distinctions between public and private self-awareness, only a few studies have employed both types of manipulations in separate conditions. As already noted, Davis and Brock (1975) used a camera in one experiment and a mirror in a second experiment. They demonstrated an increase of self-focus responses (i.e., a more frequent use of first person pronouns) with both manipulations. However, a contamination of self-focus with task performance feedback in the second experiment seriously weakens any conclusion with respect to self-awareness manipulations. A later study of a similar nature by Carver and Scheier (1978) showed increased self-focus with an audience in one experiment and with a mirror in a second. As may also be said concerning the study by Davis and Brock (1975); there is no reason to believe from a self-consciousness theoretical perspective, that these private and public self-awareness inducing stimuli would produce different results in initial self-focusing effects as measured by Carver and Scheier (1978). Another study by Scheier, Feningstein, and Buss (1974) found that when self-focus was increased by either the presence of an audience or a mirror (each employed separately in two experiments) punitiveness of male subjects toward females decreased. Once again it is not

surprising that no differences between public and private self-awareness inducing stimuli were noted since the personal and normatively accepted values regarding aggression toward females by males probably coincided.

Up to the present date, only two studies have empirically examined the private/public self-awareness distinction in a meaningful way. That is, only two studies have designed their research in such a way that differential behavioral effects would be theoretically expected from public and private self-awareness manipulations. In the study by Scheier and Carver (1980) on cognitive dissonance, mirror presence was associated with a higher awareness of initial attitudes while a camera resulted in a higher awareness of counterattitudinal behaviors. These results are as predicted in that a mirror led to increased attention to private self-aspects (attitudes) while a camera resulted in increased focus on public self-aspects (behaviors). In the second study by Froming, Walker, and Lopyan (1982), subjects held a personal belief which was at variance with a belief which they perceived was held by others. The results were as expected in that a private self-awareness inducer (mirror) led to behavior (aggression in a teaching paradigm) consistent with subjects' personal beliefs, while a public self-awareness inducer (evaluative audience) resulted in behavior congruent with the subjects' perceived beliefs of other people. The two preceding studies present the strongest evidence to date that all types of self-awareness inducers do not have the same behavioral effects.

In a study by Gibbons and Wright (1983) two conflicting belief standards, one social and the other personal, were investigated.

Subjects holding either conservative or liberal sexual attitudes were placed in a situation where most of their peers had liberal sexual attitudes. Under mirror exposure conditions, the conservative subjects attitudinally moved toward the liberal norm, but also were found to maintain their prior personal attitudes. Thus under a private self-awareness induction condition, subjects responded both to salient personal and social standards. This study, although not directly concerned with public and private self-awareness differences, suggests that this distinction is not easily classified by assuming a direct correspondence between the type of belief standard (personal or social) and the variety of self-awareness induction. It seems to be the case in this study that the high salience of both the personal and social standards was the primary factor leading to the observed responses under private self-awareness conditions. Whether this same response pattern would be observed under public self-awareness conditions is yet to be answered by future research.

Turning now to similar behavioral effects noted for situational and dispositional self-focus, these parallels are found in greater number in the private self-focus dimension (e.g., Carver & Scheier, 1978; Scheier, 1976; Scheier & Carver, 1977; Scheier & Carver, 1980; Scheier, Carver, & Gibbons, 1981). These studies are relatively clearcut with respect to showing parallels at the dispositional and situational levels in that they can be demonstrated independently. Parallels in public self-awareness and public self-consciousness however, cannot be discussed in the same way since the manipulation and disposition of

public self-focus are not independent. That is, a strictly independent comparison of public self-consciousness and public self-awareness is not possible since public self-consciousness will not be activated unless a public self-awareness inducer is present. However, those subjects high in public self-consciousness should theoretically show greater responsiveness to public self-awareness manipulations than those low on the disposition.

An example of a study including both public self-awareness and self-consciousness is that by Fenigstein (1979) where rejection by a group (public self-awareness manipulation) led subjects to a greater dislike for the group than when the group treated subjects in a non-rejecting manner. It was furthermore demonstrated that those subjects at the high end of the public self-consciousness dimension reacted most strongly to the rejection in terms of liking for the group. A difficulty with considering these results as having shown "parallels" between public self-awareness and self-consciousness is that the self-awareness manipulation is confounded with an acceptance-rejection variable. That is, it is questionable as to whether it is valid to consider group acceptance and group rejection as analogous to low and high public self-awareness.

Another study cited as demonstrating the "parallel effects" of public self-consciousness and public self-awareness (Carver & Scheier, 1981) is the previously discussed study by Scheier and Carver (1980). Their results showed that in the presence of a camera (public self-awareness inducer), subjects became more aware of their

counterattitudinal behavior and thus tended to decrease dissonance by an attitude change. --In a subsequent experiment, these results were replicated at a dispositional level, with those subjects high in public self-consciousness reducing dissonance by altering their attitudes. This finding is somewhat at variance with self-consciousness theory in that public self-consciousness had an effect in the expected direction apparently without the theoretically necessary presence of a public self-awareness inducing stimulus. Furthermore, public self-consciousness and public self-awareness effects were not strictly comparable since the high and low public self-consciousness groups were created in such a manner as to be inversely related to the respective private self-consciousness dimensions. This lack of independence of the two dimensions precludes the conclusion that the results were due solely to the public self-consciousness dimension. It is also noteworthy that since the public self-consciousness and self-awareness manipulations occurred in separate experiments, no information regarding possible interaction effects is available.

It may be concluded with regard to public self-consciousness and public self-awareness that no parallel effects are theoretically possible due to the necessity of a state manipulation to demonstrate trait effects. However, considering the incipient degree of understanding of these constructs, future research should investigate state and trait interaction effects by including high and low public self-consciousness group as well as public self-awareness manipulation and control (no manipulation) groups. The experiment by Hass (1984), as

discussed earlier, is the only research which has directly addressed this situation, thus leaving self-consciousness theory with little support as yet for the assumed public state and trait interaction.

### Pain, Self-Consciousness and Self-Awareness

Pain was at one time construed as primarily a sensory experience resulting from physical energy impinging upon specialized receptors (Leventhal & Everhart, 1979). This model assumes both direct connections between both physical and physiological levels and between physiological responses and psychological experience (Melzak, 1973). In a critique of this second assumption Melzak and Wall (1975) contend that:

a small number of specialized fibers may exist that respond only to intense stimulation, ... this does not mean that they are "pain fibers" - that they must always produce pain, and only pain when they are stimulated. (p. 4).

Thus, to assume that a high correlation exists between physical stimuli, receptor sites, and the pain experience, is questionable according to Melzak and Wall.

An important event in the pain literature is an observation made by Beecher (1946) of soldiers who incurred injuries during battle conditions. The reports of suffering and requests for pain reducing drugs were significantly less in the wounded soldier group as compared to a group of civilian males who underwent similar physical insults. Beecher proposed that this behavioral discrepancy was a function of

emotional components. He reasoned that by refusing pain medication, the soldiers remained aware of their injuries and thus felt more alive and safe from destruction. Izard (1977) offered another emotional factor in explaining this data by speculating that the pain of the soldiers' wounds relieved them of the possible guilt that they may have felt by being out of danger while their comrades continued to face the battle situation.

In 1965, Melzak and Wall presented the gate control theory of pain. This theory addressed the complexity of the pain phenomenon which became increasingly evident in the research following Beecher's early work. Gate control theory holds that the experience of pain is a result of the interaction of sensory, affective, attentional and cognitive components. A more recent theory by Leventhal (1970) maintains that the pain experience results from the parallel processing of both sensory and emotional distress components. Neither of these components is said to depend on the other but to occur simultaneously. Barber (1963) holds that pain is multidimensional in nature. He states that pain includes two components: the "sensation of pain" and the "anxiety or reaction to pain" (p. 304).

Tomkins (1963) discussed pain as a phenomenon which interacts with cognition and emotion. Regarding the sequencing of these events, Tomkins argues that pain typically elicits an emotion which interacts with the pain to generate perceptual-cognitive processes. Sternbach (1968) considered pain an emotional response since it is unlikely to occur as "pure pain". Finally, Izard (1977) maintained that pain is a

"quasi-drive arousal state" rather than an emotion per se, since a number of different emotional states may be elicited by pain.

The aforementioned theories of pain as well as the numerous studies investigating cognitive-affective factors in pain reduction (Sternbach, 1978; Weisenberg, 1975) reflect the general recognition of the importance of emotional components in the experience of pain. In the present research, the trait dimension of self-consciousness and the state manipulation of self-awareness was investigated in relation to pain. Considering the fact that the pain experience is generally assumed to contain an affective component, and that focusing on private self-aspects is "assumed to intensify the affective charge of bodily stimuli, moods, motives, fantasies and self-esteem" (Buss, 1980, p. 13), it theoretically follows that the trait of private self-consciousness or the manipulation of private self-awareness should intensify the experience of pain.

Hypotheses of Present Research

The present research is primarily concerned with the private self-focus (state and trait) implications of self-consciousness theory for the experience of pain. As already suggested, pain should be more intense for subjects at the high end of the private self-consciousness trait and when the state of private self-awareness is induced, than for subjects at the low end of the private self-consciousness dimension and for subjects without a private self-awareness inducing stimulus.

Regarding the duration of time tolerated by subjects exposed to a pain inducing stimulus, the prediction was in the reverse order to those expected for pain intensity ratings. Thus, those subjects high in private self-consciousness were expected to have a lower tolerance time than those low on the dimension, while subjects exposed to a private self-awareness inducer were expected to tolerate pain for a shorter duration of time than those not in the presence of such a stimulus. The above results were expected because the affective components of pain should theoretically become more intense when focused upon.

In addition to extending private self-consciousness theory into a new behavioral domain, the present research is one of the few studies to date to explore the relationship between the state of private self-awareness and the trait of private self-consciousness. Although self-consciousness theory predicts no particular relationship between private self-consciousness and private self-awareness, Buss (1980) hypothesized that a main effect is more likely than an interaction. Buss maintained that high and low private self-consciousness subjects are equally likely to undergo an increase in private self-awareness in the presence of a relevant inducing stimulus. In the present study, it was hypothesized that both high and low private self-consciousness subjects would show higher pain intensity ratings as well as lower pain tolerance under conditions of high (mirror presence) as compared to low (no mirror) private self-awareness conditions.

The relationship between pain and public self-focus (state and trait) is less clear than that hypothesized for private

self-consciousness and self-awareness. There are no theoretical suggestions that a specific relationship exists between self-aspects with affective components and public self-focus. However, public self-focus is assumed to lead to a greater awareness of standards of performance in a situation and greater efforts to meet those standards. In the present situation, the standard involved the toleration of a painful stimulus as long as possible. It was thus predicted that subjects in the high public self-focus condition (i.e., those high in public self-consciousness exposed to a camera) would yield higher pain tolerance scores and perhaps lower pain ratings than those subjects in the low public self-focus condition (i.e., those low in public self-consciousness exposed to a camera).

With regard to comparisons between public and private self-focus effects, differences were expected to occur between subjects high on both trait dimensions in conjunction with the corresponding self-awareness inducers (camera and mirror respectively). That is, subjects high on private self-consciousness in the presence of a mirror were expected to have lower pain tolerance times and higher pain ratings than those subjects high on public self-consciousness who were exposed to a camera.

## Chapter II

### METHOD

#### Design

The present experiment consisted of a 2 x 2 x 4 factorial design: two subject variables and one manipulated variable. The subject variables included the selection of subjects at high and low levels of both private and public self-consciousness. The manipulated variable consisted of an induction of private self-awareness (mirror focus), public self-awareness (camera focus), an attention control condition (focusing on a spot) and a standard control condition (no focusing stimulus is present). Two trials of the pain manipulation (Cold-Pressor Test) were administered. The first trial served as a baseline measure while the second was used as a test for treatment effects. The primary dependent variables were the scores in pain tolerance and pain magnitude ratings from trial I and trial II. Questionnaires were employed following trial II to provide additional self-report information regarding cognitive activity during the Cold-Pressor Test (CP).

### Subjects

A total of 96 female volunteer right-handed subjects were selected from students enrolled in psychology courses at the University of Ottawa. The subjects were chosen and assigned to groups according to their scores on the private dimension of the Self-Consciousness Scale (Fenigstein et al., 1975). This scale was administered to several classes in psychology approximately three weeks prior to the experiment. Female rather than male subjects were used for two reasons. Prior research by the present experimenter has suggested that females tend to express less interest in inspecting the visible technology and searching for possible hidden monitoring systems in the experimental situation than males. Considering that a hidden video camera was employed in the present study the above issue assumed importance. The second reason for using female subjects involved the different value males and females are likely to place on pain endurance. Males, for cultural reasons, often tend to put forth considerable effort to endure pain as a sign of "toughness". This male characteristic has often been found to manifest as a measurement problem in that ceiling effects were obtained. In the present study, a ceiling effect would have precluded possible differential treatment response patterns.

Subjects were split into those low and high in private self-consciousness. The cutoff points for these categories were determined by including those subjects who fall on either side of one standard deviation dropped over the median value of the distribution.

Subjects in each private self-consciousness group were next assigned to one of four conditions, with the limitation that each of the resulting eight groups had an equal number of subjects above and below the median value for public self-consciousness.

### Apparatus and Instruments

#### Cold-Pressor Test

The Cold-Pressor Test (CP) was first employed for experimental purposes in hypertension research (Hines & Brown, 1933). It was found that submerging a limb in freezing ( $0-2^{\circ}\text{C}$ ) water raised blood pressure. Later research found relationships between the submerged hand temperature, blood pressure, and self-reported pain (Wolf & Hardy, 1941). Recent research has examined the relationship between CP induced pain and (1) cognitive strategies (Beers & Karoly, 1979; Blitz & Dinnerstein, 1971; Scott & Barber, 1977; Worthington, 1978), (2) hypnotically induced insensitivity (Barber & Hahn, 1962; Evans & Paul, 1970; Spanos, Radtke-Bodirik, Ferguson, & Jones, 1979), (3) stress inoculation (Hackett & Horan, 1980; Turk, 1978), (4) self-control strategies (Berger & Kanfer, 1975; Kanfer & Seidner, 1973), and (5) preparatory information regarding sensations (Leventhal, Brown, Shacham, & Engquist, 1979).

The procedure generally employed for CP involves immersion of a hand in ice water ( $0^{\circ}-3^{\circ}\text{C}$ ) for either a specific duration as defined by the experimenter or for a pain tolerance point as determined by the

subject. In the former type of design, subjects are typically asked to make pain ratings at particular points in time (e.g., Evans & Paul, 1970; Spanos et al, 1979; Stam, Petrusic, & Spanos, 1981) within a predetermined immersion period. In the second type of study, the primary dependent measure is the time duration that the subject chooses to immerse the hand (e.g., Beers & Karoly, 1979; Kanfer & Goldfoot, 1966; Westcott & Horan, 1977). As well as pain intensity ratings and tolerance times, the point at which pain is first experienced is sometimes measured (e.g., Beers & Karoly, 1979; Hackett & Horan, 1980; Scott & Leonard, 1978).

A number of studies have used physiological measures with CP pain (Barber & Hahn, 1962; Evans & Paul, 1970; Jarenko, 1978; Johnson, 1974). In each of these investigations, one or more physiological indices was unaffected by the CP procedure. Sternbach (1968) pointed out that a physiological response pattern for pain has not been empirically determined. Hilgard (1969) stated that a satisfactory pain index

is present (or increased) when pain is felt and absent (or reduced) when pain is not felt. The correlation between the physiological indicator and verbal report has to be established both positively and negatively if the indicator is to be used in confidence in the absence of supplementary verbal report ... there is at present no single accepted indicator of pain that can be counted on to vary in an orderly way with degrees of pain and absence of pain (p. 104).

Regarding the time of self-reports of pain and/or distress, considerable methodological differences are found in the literature. The majority of studies have relied on retrospective reporting for one or all measures of pain magnitude (e.g., Barber & Hahn, 1962; Evans & Paul, 1970; Girodo & Wood, 1979; Scott & Barber, 1977). However, a number of investigations have used non-retrospective pain magnitude reports (Leventhal et al, 1979; Spanos et al; 1979; Stevens & Heide, 1977).

The actual apparatus comprising the CP test is similar in most studies in that a container is filled with ice water and maintained at temperatures ranging from  $0^{\circ}$  -  $3^{\circ}\text{C}$ . Variations in the apparatus are primarily obvious with regard to water circulation and temperature control issues. Most studies periodically add ice and stir the water to maintain the correct temperature range (e.g., Hackett & Horan, 1980; Kanfer & Goldfoot, 1966; Worthington, 1978). Some studies have elaborated on the CP tank by separating the ice from the hand immersion area by a screen (e.g., Scott & Barber, 1977; Scott & Leonard, 1978; Spanos et al, 1979), while others have employed an air pump to facilitate water circulation (Girodo & Wood, 1979; Johnson, 1974).

In the present study, CP pain measures included both tolerance duration and non-retrospective magnitude ratings made at predetermined points in time. Details regarding these measures as well as other self-report information concerning the CP test will be discussed in a later section.

The apparatus used in the present research was a Plexiglass container, 58 cm long by 19 cm deep by 26 cm wide. The container was

sectioned in half by a perforated Plexiglass divider. One half of the container was filled with ice and an aquarium vibrator air pump (sound attenuated) was employed to maintain water circulation and thus minimize temperature differentials in the tank. A thermometer was attached to the tank for the purpose of temperature monitoring. An opaque plastic sheet covered the top of the container, with an opening large enough for the subject to easily pass one hand.

The Cold-Pressor test was chosen to investigate pain and self-consciousness for two primary reasons. Other typically used methods of pain induction involve explicit or implicit experimenter presence (e.g., experimenter control of electric shock from another room), which may induce public self-awareness, thus contaminating private self-awareness inductions. The second reason for choosing CP as the pain induction technique is its relatively slow onset of pain, therefore allowing more time for self-focusing effects to occur than would be the case for some other methods (e.g., electric shock).

#### Self-Consciousness Scale (Appendix 1)

##### Development

In 1975, Fenigstein, Scheier, and Buss developed a questionnaire on self-consciousness. From seven fundamental content areas in which individuals could be self-attentive, 38 items were constructed and administered to over 200 university students. The number of items were next reduced to 23 by factor analysis to form three factors. In samples of several hundred subjects each, the questionnaire was administered to

over 2000 students. Successive factor analyses of these samples showed a consistent emergence of the same three factors, which are represented by the scales of private self-consciousness, public self-consciousness and social anxiety (see Appendix 2 for items and factor loadings). As already discussed, the private self-consciousness dimension involves attention to internal processes such as cognitions or affects while public self-consciousness refers to an awareness of the self as a social object. Social anxiety is assumed to derive from public self-consciousness in that it involves an apprehensiveness over evaluation in a social context.

The present version of the scale consists of 23 items: 10 items in the private self-consciousness subscale, 7 items in the public self-consciousness subscale and 6 items in the social anxiety subscale. Each test item is answered on a scale from extremely uncharacteristic (0) to extremely characteristic (4), with respect to the respondent. In addition to the theoretical distinction between the public and private self-consciousness dimensions, the correlation between these subscales over a large number of samples generally were found to be in the low .20s.

#### Validity

The construct validity of the private self-consciousness subscale was shown in the previously discussed study by Carver and Scheier (1978) in which subjects high in private self-consciousness made more self-focus sentence completions than those low on the private dimension.

Regarding convergent validity, Turner, Scheier, Carver, and Ickes (1978) found that private self-consciousness was significantly correlated with the Guilford-Zimmerman Thoughtfulness Scale (Guilford & Zimmerman, 1949) and a new version of the Paivio Imagery Inventory (Hiscock, 1976). These two studies suggest that high private self-consciousness individuals tend to be reflective and employ mental images in problem solving. Public self-consciousness has been found to be correlated with sociability (Carver & Glass, 1976) as measured by the EASI III Temperament Survey (Buss & Plomin, 1975). Turner et al (1978) provided further support for the relationship between public self-consciousness and sociability.

Discriminant validity has also been investigated in the aforementioned studies. Carver and Glass (1976) found that both private and public self-consciousness were minimally related to achievement needs (Edwards, 1957), activity level (Buss & Plomin, 1975), test anxiety (Mandler & Sarason, 1952), and I.Q. measures (Otis, 1954). Turner et al (1978) found both scales to be positively related to emotionality (Buss & Plomin, 1975) and self-monitoring (Snyder, 1974). They also discovered no relationship between the private and public subscales and social desirability (Crowne & Marlowe, 1964), and an inverse relationship between the subscales and a self-esteem measure (Morse-Gergen, 1970). However, each of the aforementioned correlations was weak (middle .20s), thus indicating that the Self-Consciousness Scale is not seriously confounded with the above constructs.

### Reliability

Fenigstein, Scheier, and Buss (1975) administered the Self-Consciousness Scale twice to 84 subjects with a two week interval between periods. Test-retest correlations were .79 for private self-consciousness, .84 for public self-consciousness, .73 for social anxiety and .80 for the total score.

### Normative Data

The means and standard deviations of the private and public self-consciousness and the social anxiety subscales show approximately normal distributions. The female score distribution on public self-consciousness was found to be negatively skewed. Generally however, the data show minimal sex differences (see Appendix 3).

### Pain Rating Scale (Appendix 4)

Two pain rating scales were completed during the CP test at the 15 second and 30 second immersion points, for each of the two trials. This instrument consisted of a Likert-type scale with three numbered points, 0, 5, and 10. The number "0" is labeled "no pain", the number "5" labeled "moderate pain" and the number "10" labeled "excruciating pain". The remaining unnumbered points on the scale were unlabeled and described to the subject as representing intermediary values.

### Post CP Questionnaire (Appendix 5)

This questionnaire consisted of four main items regarding:

- (1) distress experienced during the Cold-Pressor,

- (2) the point at which pain was first felt,
- (3) the proportion of time spent thinking about the self, instructions, coldness and other things,
- (4) the degree of coldness experienced, and
- (5) the use or non-use of a coping strategy.

#### Body Consciousness Questionnaire (Appendix 6)

Miller, Murphy, and Buss (1981) developed the Body Consciousness Questionnaire (BCQ) from a set of items which at face value seemed to reflect awareness of private and public aspects of the body. Factor analytic work yielded three factors: private body consciousness, public body consciousness and body competence (see Appendix 7 for factor loadings). A sample of 628 subjects showed a correlation of .37 between private and public body consciousness and a correlation of .21 between each of the body consciousness scales and body competence. The test-retest reliabilities of the private and public body consciousness and body competence scales were .69, .73, and .83 respectively, for a sample of 130 undergraduate men and women.

In the study by Miller, Murphy, and Buss (1981), it was found that subjects scoring high on the Private Body Consciousness Scale had greater awareness of the stimulating influence of caffeine than did those at the low end of the scale. Public body consciousness level on the other hand, had no influence on bodily awareness of caffeine induced changes. Another study by Miller and Cox (1982) found high public body

consciousness women to be more concerned with physical appearance (as measured by makeup use) than those low on the scale. Private body consciousness, by contrast, was not associated with cosmetic behavior. The findings from the above mentioned studies provide empirical evidence to support the conceptual differences between private and public body consciousness.

Miller et al (1981), found no significant relationships between the private and public body consciousness scales and a modified version of the Hypochondriasis scale of the Minnesota Multiphasic Personality Inventory (Hathaway & McKinley, 1967). This latter finding suggests that those individuals who report a greater number of symptoms have no higher body awareness than those who do not. This study furthermore showed no relationship between self-esteem and the body-consciousness measures. The body consciousness measures were also found not to be correlated with emotionality as measured by the Emotionality Scale of the EASI Temperament Survey (Buss & Plomin, 1975). Private self-consciousness and private body consciousness were found to be related, but distinct personality dimensions, while public body consciousness and public self-consciousness were highly correlated and thus considered to be measuring the same thing.

The means and standard deviations for the three Body Consciousness Questionnaire scales are presented in Appendix 8. This normative sample was composed of 731 women and 568 men. Women were found to score significantly higher on the public body consciousness scale ( $p < .01$ ). No other sex differences were noted with regard to the body

consciousness measures. In the present study, the Body Consciousness Questionnaire was employed in an exploratory manner to investigate possible relationships between pain and body consciousness.

#### Eysenck Personality Questionnaire (Appendix 9)

The Eysenck Personality Questionnaire (EPQ) is the latest development in a series of personality instruments by the same author. The EPQ (Eysenck & Eysenck, 1975) differs from its immediate predecessor (i.e., the EPI) by certain modifications of the neuroticism-stability (N) and extraversion-introversion (E) dimensions, as well as the addition of the psychoticism (P) variable. A complete presentation of reliability, validity, and normative data are reported in the EPQ Manual (Eysenck & Eysenck, 1975). Standardization data are available for normal and abnormal samples. Test-retest reliabilities of the various EPQ scales over a one month period range from .80 to .90. The rationale for administering the EPQ in the present research was a study by Lynn and Eysenck (1961) in which it was suggested that extraverts had a higher tolerance for pain than introverts due to their lower anxiety levels. These authors furthermore found a negative correlation between pain tolerance and neuroticism.

## Procedure

### Initial Contact

Students completing the Self-Consciousness Scale were contacted by telephone to obtain subject participation. The project was described to potential subjects as a study concerned with "moderate stress". The Cold-Pressor test was briefly described and the importance of obtaining "assistance" to conduct the project was stressed. Finally, subjects were told that the project would involve one session, constituting a total of approximately 40 minutes.

### Pretest

On arrival at the experimental site, the subject was greeted by the experimenter and shown to the experimental cubicle where she was seated in a height adjustable chair. The subject was next told by the experimenter that the study was concerned with "the relationship between subtle muscle movements and the experience of cold water". The experimenter then informed the subject that she would be asked to place each hand in the water, with a short rest break between these hand immersions. The particular hand which each subject immersed on the first trial was counterbalanced across experimental conditions. The subject was then fitted with a "sensor" (bogus electrode), which was attached to the back of the neck. The CP tank (placed on top of a sound isolated box containing the vibrator air-pump) was next introduced. To immerse the hand in the CP tank while seated, the subject merely had to extend the

arm downwards through the opening in the opaque plastic sheet covering the tank. The opaque tank cover was used in the attempt to reduce the visual "stimulus pull" which the hand may have in the ice water.

The subject was then requested to roll up her sleeve and to remove any bracelets, rings or watch. It was next explained to the subject that for a short period after the experimenter exits from the room, she was "to sit quietly looking straight ahead with open eyes". The subject was also asked at this time "to keep the face, neck and head as still as possible" during the initial quiet period and ice water immersion. The rationale given for this requested body stabilization is that the "sensor" would only operate properly under these conditions.

The subject was then informed that when the quiet waiting period was over, the experimenter would give the signal to immerse the hand up to the wrist by broadcasting the word "now" over an intercom system. The subject was told that "when the hand is in the water, it should remain still and limp and the fist should not be clenched, nor should the muscles in the arm or hand be tensed".

It was next explained to the subject that during hand immersion she would make two pain magnitude ratings by "striking a line" through one of the scales (placed on a table in front of the subject) for each rating (Appendix 4). The subject was informed that the first rating point (15 seconds after hand immersion) would be signaled by the word "rate" over the intercom speaker. At the 30 seconds mark, the subject was signaled by the words "30 seconds rate". The subject was informed beforehand of the importance of keeping the hand immersed for at least

30 seconds and that she would be signaled when this time period had passed. A request was then made to keep the hand in the water for "as long as possible" after the 30 seconds rating. The subject was also told that if the "discomfort in the hand is too great", she "is free to remove it at any point". The experimenter terminated hand immersion for those subjects who had not removed their hands from the ice water after a five minute period.

Just prior to leaving the room, the experimenter assured the subject that no damage could be caused to the hand by the ice water. The subject was next requested to press a button attached to the experimental chair with the non-immersed hand when the immersed hand was withdrawn from the water; the subject was told that "the button-press signal is the only way that the experimenter could know when the hand has been withdrawn from the ice water tank". In fact however, the experimenter was able to monitor the subject's hand withdrawal by a hidden camera. This deception surrounding the experimenter's monitoring of hand withdrawal was for the purpose of reducing the likelihood of inducing public self-awareness. That is, if the subject believed that she was being monitored by a camera, public self-awareness would have theoretically been elicited. The subject was finally told that she should "briefly turn the head slightly from its straight ahead position to see the opening in the ice water tank through which the hand was to be placed, after which the head should be returned to looking straight ahead" (the subject was given similar instructions regarding the two pain ratings).

After exiting from the experimental room, the experimenter timed a one minute period, at the end of which the signal "now" was given to immerse the hand. This waiting period of one minute was imposed primarily as a time during which the subject could become accustomed to the self-awareness inducing stimuli used in the posttest. This procedure was adopted after noting a discrepancy in results between two studies which appears to be related to mirror exposure time. Carver and Scheier (1981b) suggested that their failure to find the decrease in the palmar sweat index (PSI) which was expected to result from mirror induced inwardly-directed attention, may have been caused by too short a time period between commencement of mirror exposure and PSI. They argued that a certain length of time may be necessary for the mirror to decrease in salience as a novel physical stimulus and increase in salience as a reminder of the self. The expected results regarding mirror exposure and PSI were found by Paulus, Annis, and Risner (1978), where a 30-60 second period had separated the beginning of mirror exposure and PSI measurements.

7 During both the waiting period and the CP test, the subject was monitored by a video-recorder unit hidden in a speaker cabinet located about 1.5 m in front of the seated subject. This monitoring device was used as a check on the subject's compliance with the instructions to minimize bodily movements and as a method of measuring the direction of visual focus. The experimental reasons for requiring head and facial stillness is discussed in the section describing posttest manipulations.

Subsequent to the subject's hand withdrawal, the experimenter reentered the room and provided the subject with towels to dry her hand and to remove the electrode. The subject was then escorted to another room where she sat quietly for a five minute period before returning to the experimental room for the second trial of the experiment.

#### Posttest

After returning to the experimental cubicle, the same preliminary instructions as used in the pretest regarding pain ratings were presented. After being fitted again with the bogus electrode, the subject received instructions appropriate to the experimental condition to which she had been assigned.

#### Mirror (private self-awareness)

One quarter of the subjects were exposed to a mirror during the one minute pre-immersion period and the CP test. The mirror measured 18 cm x 23 cm and was placed directly in the center of the speaker cabinet which was 1.5 m in front of and at the same height as the subject's face. The subject's face was observed and recorded by a hidden video-camera placed in the speaker cabinet and situated directly under the mirror. As was the case in the pretest, this measure was taken as a check to insure subject compliance with the instructions regarding bodily movements, and to record the subject's gaze pattern.

Self-awareness studies employing a mirror have generally placed the mirror in front of the subject, assuming that the subject will see her (or his) reflection frequently enough to induce self-awareness. Most

studies have either introduced the mirror as part of another experiment and thus not to be removed for this reason (e.g., Carver, 1975; Scheier, Fenigstein, & Buss, 1974), or as a necessary part of a subsequent experimental task (Wicklund & Duval, 1971). A third method of introducing the mirror has presented it as a component of the study which will be explained to the subject at the end of the experiment (e.g., Scheier, Carver, & Gibbons, 1981). This latter procedure was used to increase the salience of the mirror since the task (handling a live snake) was absorbing and thus likely to capture the subject's attention. None of these studies however, controlled or monitored the duration of visual contact with the mirror. Thus the variability (both within and between subjects) of visual contact with this commonly used visually related self-focusing manipulation has been ignored and remains unknown.

In the present study, the subject was visually "locked" into mirror focusing by means of the instructions. The subject was asked to focus on her facial reflection as a "proven method of maintaining head and facial stillness". It was again emphasized that an "absence of movement is absolutely necessary for the measurements from the sensor" attached to the subject's neck. Thus the head and facial immobility required for physiological measurements served as the rationale for maintaining continuous visual contact with the mirror reflection during the one minute pre-immersion waiting period and the CP test.

In addition to reducing inter-subject variability regarding visual contact with the subject's reflection, the bogus electrode deception served a second primary purpose. A potential side effect of mirror

presence which remains unexamined in the self-awareness literature is the behavioral effect resulting from the visual feedback of facial expressions. In some cases, this feedback may create a situation where subjects behave in a manner congruent with mirror mediated inferences of internal states. This self-perception hypothesis (Bem, 1972) may be especially relevant with mirror induced self-awareness when an individual is experiencing pain. Reflected facial expressions associated with pain may lead to increased pain intensity ratings and/or decreased pain tolerance times in comparison to experiencing pain with no such visual feedback. By minimizing facial expressive changes through the bogus electrode deception, the mirror group was thus less likely to be differentially affected by visual feedback with regard to pain magnitude and tolerance.

Camera (public self-awareness):

One quarter of the subjects were video-recorded by a camera located approximately 1.5 m in front of and in full view of the subject. The recordings were made during the one minute pre-immersion period and during the CP test. The subjects were told that the video-tapes of their faces would be "studied by members of the psychology department to possibly provide additional information regarding the experience of cold water hand immersion". Subjects were next instructed to "focus on the camera lens since this has been found to be a proven method of maintaining head and facial stillness". Once again it was emphasized that an "absence of movement is absolutely necessary for the measurements from the sensor" fitted to the subject's neck.

As was the case in the mirror condition, the facial immobility procedure was used in the camera condition to reduce inter-subject variability with respect to visual contact with the camera. However, a second consideration in employing this procedure was the possibility of more direct links between facial expressiveness and emotional (and/or arousal) components of pain than those assumed to be operating in the aforementioned self-perception model.

Tomkins (1962) argued that facial expressions are the main determinants of affect, while Izard (1971) considered the face as instrumental in stimulating neural circuits which lead to emotional experience. Those researchers assigning importance to facial displays in the experience of emotion are in disagreement with regard to the direction of physiological responses often associated with emotional arousal. A number of studies have found an inverse relationship between physiological arousal and facial expressions (e.g., Buck, Savin, Miller, & Caul, 1972; Lanzetta & Kleck, 1970; Notarius & Levenson, 1979), while other studies have found a positive relationship between arousal and facial expressions (e.g., Kleck, Vaughan, Cartwright-Smith, Vaughan, Colby, & Lanzetta, 1976; Lanzetta, Cartwright-Smith, & Kleck, 1976). However, other sources maintain that those studies supporting the facial expressive implications for emotional experience and physiological responding are unconvincing for methodological reasons (Buck, 1980) and that available data are equivocal (Leventhal, 1980).

In the present study, the aforementioned employment of the bogus "sensor" deception constituted an attempt to control for potential

effects of possible facial differences across conditions. By minimizing between group facial expressiveness (differences, associated emotional components should also theoretically have been equalized, thus reducing the likelihood of facially associated arousal or affect unequally influencing pain variables between conditions. If facial expressive displays were to occur with the experience of CP pain, they would most likely be inhibited in the camera (public self-awareness) condition. In the study by Kleck et al (1976), it was found that physiological arousal measures and subjective pain reports co-varied with facial expressiveness. Furthermore, facial expressiveness, subjective pain intensity reports and arousal measures were lower when subjects were observed rather than alone during pain administration. In terms of self-consciousness theory, it appears that a public self-awareness manipulation (audience) led to reductions in facial expressive behavior, arousal measures and intensity of pain reporting. Thus by holding facial expressiveness constant in the present study, possible changes in facial movement, as well as the potential effects that this may have had on pain, did not exert a differential influence on pain reporting between conditions.

#### Spot (Attention Control)

One quarter of the subjects were asked to focus on a black spot in the center of a light brown cardboard background (18 cm x 23 cm) located on a speaker cabinet approximately 1.5 m in front of the subject. This condition served as an attention control for the private and public

self-awareness conditions. If focusing on a spot yielded results similar to focusing on a self-awareness inducer (mirror and/or camera), this would seriously have weakened the self-awareness hypothesis and lent more credence to a distraction hypothesis in accounting for any pain parameter differences found between these groups and a non-manipulation control group.

Subjects were asked to "focus on the spot since this has been found to be a proven method of maintaining head and facial stillness". It was again emphasized that an "absence of movement is absolutely necessary for the measurements from the sensor" attached to the subject's neck. In a similar fashion to the self-awareness conditions, the necessity for head and facial immobility in obtaining physiological measurements functioned as the rationale for maintaining a continuity of visual focus on the spot during the one minute pre-immersion and CP test periods. With respect to monitoring the subject's compliance with the focusing instructions, a video-camera was hidden behind the speaker audio fabric, in the same fashion as for mirror condition. Once again the camera was aimed at the subject's face permitting a relatively accurate monitoring of where the subject was focusing.

#### Control (No Manipulation)

This condition was essentially identical to the pretest situation where the subject was asked to maintain head and facial stillness for the purpose of obtaining physiological measurements.

### Postexperimental Procedure

Following the withdrawal of the subject's hand from the CP tank, the experimenter re-entered the room and escorted the subject to another room where she was asked to complete three questionnaires (Post CP Questionnaire, Body Consciousness Questionnaire and EPQ). These questionnaires were completed with the experimenter absent from the room. Subsequent to the subject having informed the experimenter of the completion of the questionnaires, the experimenter re-entered the room. The experimenter questioned the subject regarding what she believed was the purpose of the experiment and then informed her that a summary of the project results would be sent to each participant. Subjects were thanked for their participation and asked not to discuss the project with other students till the end of that school term (approximately six weeks).

### Dependent Measures and Analysis

The primary dependent measures were obtained in vivo:

- (1) Two pain magnitude ratings which occur at 15 and 30 seconds after hand immersion.

Associated hypothesis: Pain magnitude ratings should be highest for the high private self-focus conditions (i.e., high private self-consciousness and mirror exposure).

- (2) The tolerance duration of hand immersion.

Associated hypothesis: Tolerance durations should be lowest for the high private self-focus conditions (i.e., high private self-consciousness and mirror exposure).

Both magnitude ratings and tolerance times were used since a significant correlation between these measures cannot always be assumed (e.g., Avia & Kanfer, 1980; Beers & Karoly, 1979; Stone, Demchik-Stone, & Horan, 1977). Pain magnitude ratings taken at the point of hand withdrawal (e.g., Worthington, 1978) were not used since this procedure confounds pain with tolerance time.

The secondary dependent measures were obtained retrospectively:

- (1) The magnitude of pain when it was first felt during the second trial.
  - a Associated hypothesis: Pain magnitude scores should be highest for high private self-focus conditions (i.e., high private self-consciousness and mirror exposure).
  
- (2) The degree of distress experienced during the second trial.
  - a Associated hypothesis: Distress scores should be highest for high private self-focus conditions (i.e., high private self-consciousness and mirror exposure).
  
- (3) The degree of coldness experienced during the second trial.

- a Associated hypothesis: Coldness magnitude scores should be highest for high private self-focus conditions (i.e., high private self-consciousness and mirror exposure).
- (4) The proportion of time thinking about the self and water coldness.
- a Associated hypothesis: The proportion of time thinking about water coldness should be greater for high in contrast to low state and trait private self-focus.
- b Associated hypothesis: A greater proportion of self-related cognitions should be found in the high state and trait self-focus conditions (public, and private) than in those conditions representing the low ends of these dimensions.

## Chapter III

## RESULTS

The primary question of this research was "Is the response to laboratory induced pain affected by dispositional self-consciousness and/or induced states of self-awareness". In attempting to address this question two primary dependent measures were employed: (1) tolerance duration in cold water, and (2) pain magnitude ratings taken at 15 second and 30 second points after hand immersion. A number of secondary measures involved retrospective ratings of the pain experience as well as questions related to cognitive contents during hand immersion. Subjects post-experimentally assessed (1) the pain magnitude when it was first felt on the second trial, (2) the amount of distress experienced on the second trial, (3) the coldness of the water on the second trial, (4) whether or not a strategy was used during the second trial, and (5) the degree of cognitive focus on the self, instructions, coldness, or something other than these categories during the second trial.

Finally, to investigate the relationship between visual contact with the stimulus on trial two and the output measures, subjects' visual focus was surrepetitiously monitored 60 seconds before and during hand immersion in the cold water.

### Cold Tolerance Duration

Tolerance duration was analyzed by a 4 x 2 x 2 repeated measures ANOVA (see Table 1). The tolerance scores were reciprocally transformed to create a logically more direct pain measure which was consistent with other dependent measures regarding directionality of meaningful change. The treatment manipulation failed to yield significant differences between the four experimental groups,  $F(3,71) = 0.60$ , n.s. (see Table 2).

Likewise, the public self-consciousness measure showed a non-significant difference between the high and low ends of this dimension,  $F(1,71) = 0.09$ , n.s. However, the private self-consciousness analysis yielded a marginally significant difference between the high and low scorers ( $M$ 's = 16 and 19 respectively,  $F(1,71) = 3.76$ ,  $p = .057$ ). High private self-consciousness individuals tended to be slower at removing their hands from the ice-water.

A treatment X private self-consciousness interaction was marginally significant,  $F(3,71) = 2.33$ ,  $p = .08$ . Since the treatment manipulation occurred only on the second trial of the experiment, separate analyses of tolerance measures were conducted for each trial to determine the locus of the interaction effect. This analysis showed the effect most strongly evident on the first trial, suggesting an initial sampling bias resulting in an artifactual finding. A trial effect analysis showed a faster ice-water termination time on the second trial ( $M$ 's = 17 and 19 for the first and second trial respectively;  $F(1,71) = 8.44$ ,  $p = .005$ ).

Table 1

Analysis of Variance for Tolerance Duration

Source	Sum of Squares	Degrees of Freedom	Mean Square	F	Tail Prob.
Mean	0.05517	1	0.05517	640.35	0.0000
Treatment	0.00016	3	0.00005	0.60	0.6149
Private	0.00032	1	0.00032	3.78	0.0565
Public	0.00001	1	0.00001	0.09	0.7638
TR	0.00060	3	0.00020	2.33	0.0818
TP	0.00012	3	0.00004	0.47	0.7062
RP	0.00012	1	0.00012	1.41	0.2392
TRP	0.00023	3	0.00008	0.88	0.4541
Error	0.00612	71	0.00009		
Z	0.00007	1	0.00007	8.44	0.0049
ZT	0.00002	3	0.00001	0.84	0.4773
ZR	0.00000	1	0.00000	0.11	0.7454
ZP	0.00000	1	0.00000	0.03	0.8599
ZTR	0.00001	3	0.00000	0.62	0.6051
ZTP	0.00002	3	0.00001	0.74	0.5334
ZRP	0.00000	1	0.00000	0.07	0.7979
ZTRP	0.00002	3	0.00001	0.67	0.5722
Error	0.00056	71	0.00001		

Table 2

Combined Tolerance Measures for  
Treatment Manipulations and Personality Dimensions

	<u>N</u>	<u>Mean</u>	<u>SD</u>
Mirror	22	18.6	7.2
Spot	21	18.1	6.8
Camera	22	16.5	6.7
Control	22	18.3	7.1
High private self-consciousness	41	16.3	6.8
Low private self-consciousness	46	19.3	6.9
High Public self-consciousness	43	17.6	7.4
Low public self-consciousness	44	18.2	6.5

A final series of analyses were conducted to determine whether the use of a strategy affected tolerance measures. Neither the first nor the second tolerance times showed a relationship to the reported use of a strategy,  $t = -.24$ ,  $p = .81$  and  $t = -1.2$ ,  $p = .23$ , respectively (two-tailed). The means for the first tolerance measure for those subjects using a strategy in contrast to those not using a strategy are 17.1 ( $SD = 6.9$ ) and 17.5 ( $SD = 6.7$ ) respectively. For the second tolerance measure the means for those using a strategy versus non strategy users are 17.9 ( $SD = 7.5$ ) and 19.8 ( $SD = 6.2$ ) respectively. Since private self-consciousness showed a tendency towards significance in the previous analysis, the tolerance measures were next analyzed with regard to high and low private self-consciousness subjects. For the first tolerance measure, no significant differences were found between strategy users versus non-users in either the high private self-consciousness groups ( $t = -.74$ ,  $p = .47$ , two-tailed) or the low private self-consciousness groups ( $t = .77$ ,  $p = .45$ , two-tailed). The second tolerance measure also showed no significant differences for strategy users versus non-users for the high private self-consciousness subjects ( $t = -1.69$ ,  $p = .10$ , two-tailed) or for the low private self-consciousness subjects ( $t = .28$ ,  $p = .78$ , two-tailed). For both trials no significant differences were found among non-strategy users with respect to high and low private self-consciousness (Trial 1:  $t = .17$ ,  $p = .87$ ; Trial 2:  $t = -.30$ ,  $p = .77$ ). However, among those subjects who did use a strategy, the speed of the cold water immersion termination was greater for low

versus high private self-consciousness subjects in both trials,  $t = 2.23$ ,  $p = .03$ , two tailed (for both the first and second trials).

An examination of the mean values for the second trial (which is specifically relevant to the use of a strategy) for those who employed a strategy, shows that although the only statistically significant difference was between the high and low private self-consciousness groups, it is interesting to note that the high private self-consciousness subjects marginally differ from the low and high private self-consciousness non-strategy users ( $t = -1.78$ ,  $p = .08$  and  $t = -1.69$ ,  $p = .10$  respectively). That is, the lowest mean cold water termination speed was found in the high private self-consciousness strategy users (see Table 3).

#### In Vivo Magnitude Measures

A 4 x 2 x 2 repeated measures ANCOVA was performed on the two magnitude measures of the second trial, the trial one measures serving as covariates. None of the independent measures yielded significant results (see Table 4). The first trial magnitude measures were highly significant as covariates,  $F(1,70) = 160.03$ ,  $p < .001$ . The trial factor analysis showed consistently higher magnitude ratings on trial two,  $F(1,70) = 29.86$ ,  $p < .001$  (see Table 5). To investigate the possibility that significant findings on the personality dimensions may have been masked by the covariance analysis, separate analyses of the magnitude measures were conducted on each trial. These separate trial analyses

Table 3

Tolerance Measure Scores According to  
Strategy Use and Private Self-Consciousness

	Strategy use	Strategy non-use
High private self-consciousness	<u>Mean</u>	20.4
	<u>SD</u>	5.3
Low private self-consciousness	<u>Mean</u>	19.6
	<u>SD</u>	6.7

Table 4

Analysis of Variance for the Second Trial  
Magnitude Measures

Source	Sum of Squares	Degrees of Freedom	Mean Square	F	Tail Prob.
Treatment	652.30395	3	217.43465	0.83	0.4830
Private	0.53625	1	0.53625	0.00	0.9641
Public	65.73572	1	65.73572	0.25	0.6165
TR	1037.13352	3	345.71117	1.32	0.2760
TP	919.85976	3	306.61992	1.17	0.3284
RP	36.48469	1	36.48469	0.14	0.7105
TRP	1051.98872	3	350.66291	1.34	0.2700
I-St Covar	42034.11536	1	42034.11536	160.03	0.0000
Error	18386.66797	70	262.66669		
Z	2027.37862	1	2027.37862	29.86	0.0000
ZT	116.37721	3	38.79240	0.57	0.6357
ZR	59.26773	1	59.26773	0.87	0.3533
ZP	1.53309	1	1.53309	0.02	0.8810
ZTR	76.96610	3	25.65537	0.38	0.7692
ZTP	929.98763	3	309.99588	4.57	0.0056
ZRP	126.55023	1	126.55023	1.86	0.1765
ZTRP	243.08693	3	81.02898	1.19	0.3186
I-St. Covar	1512.16107	1	1512.16107	22.28	0.0000
Error	4751.98893	70	67.88556		

LEGEND: T = Treatment  
R = Private self-consciousness  
P = Public self-consciousness  
Z = Trial

demonstrated no significant differences on either the treatment factor or personality dimensions. The means and standard deviations of the magnitude measures considered by treatment conditions and personality dimensions are presented in Table 5.

#### Post-Experimental Measures

First-Pain. The first-pain variable, involving the retrospective subjective evaluation of pain magnitude as first felt during the second trial of hand immersion, was analyzed by a 4 x 2 x 2 ANOVA. No significant differences were found over the treatment conditions or the private self-consciousness dimension ( $p > .30$ ). However, the public self-consciousness dimension analysis indicated a differential rating on this measure. Those subjects at the high end of this scale tended to evaluate the first pain felt to be significantly more intense than those at the low end of the scale,  $F(1,71) = 4.235$ ,  $p = .043$ . The respective mean values for the first pain variable are shown in Table 6.

Distress. A second post-experimental measure involved the retrospective evaluation by the subjects of the overall degree of distress experienced during hand immersion on the second trial (see Table 6). A marginal level of significance was found on the public self-consciousness factor ( $F(1,71) = 2.94$ ,  $p = .091$ ), suggesting that those subjects high on this dimension experienced greater negative affect during the cold water immersion than those at the low end of the

Table 5

Mean Magnitude Measures for Treatment Manipulation  
and Personality Dimensions

		First Magnitude	Second Magnitude	Third Magnitude	Fourth Magnitude
Mirror	<u>Mean</u>	44.5	68.4	45.1	73.2
	<u>SD</u>	18.4	19.9	20.7	23.4
Spot	<u>Mean</u>	44.1	72.6	48.3	77.7
	<u>SD</u>	19.4	22.5	23.2	20.0
Camera	<u>Mean</u>	46.8	64.2	45.2	66.9
	<u>SD</u>	21.3	21.4	19.1	20.1
Control	<u>Mean</u>	40.4	63.8	43.5	72.1
	<u>SD</u>	20.8	22.1	24.4	26.9
High private self- consciousness	<u>Mean</u>	42.9	66.9	43.9	72.9
	<u>SD</u>	19.4	17.9	23.2	20.3
Low private self- consciousness	<u>Mean</u>	44.9	67.4	46.8	72.0
	<u>SD</u>	20.3	24.3	20.3	24.8
High public self- consciousness	<u>Mean</u>	46.7	68.5	48.5	74.4
	<u>SD</u>	19.9	22.5	21.9	22.8
Low public self- consciousness	<u>Mean</u>	41.3	65.9	42.5	70.5
	<u>SD</u>	19.6	20.5	21.2	22.7

Table 6

Mean Ratings for Post-Experimental First Pain, Distress,  
Coldness Magnitude and Cognitive Focus Measures

	First Pain	Distress	Coldness Magnitude	& Self- Focus	& Instruc- tion Focus	& Coldness Focus	& Other Focus
Mirror	Mean	39.5	58.4	71.9	23.2	17.3	40.9
	SD	22.4	25.5	20.0	19.1	16.4	21.8
Spot	Mean	48.6	59.6	65.8	14.3	20.5	38.1
	SD	25.0	21.9	24.3	11.6	18.3	18.9
Camera	Mean	34.9	58.2	67.8	16.4	15.0	44.1
	SD	21.8	17.7	21.3	16.2	14.7	25.0
Control	Mean	39.5	49.5	61.7	10.0	12.7	54.5
	SD	27.9	29.4	30.4	11.1	12.8	26.7
High private self- consciousness	Mean	42.4	57.7	64.7	18.8	12.7	44.9
	SD	24.3	21.3	23.9	18.6	11.8	25.1
Low private self- consciousness	Mean	38.9	55.2	68.7	13.5	19.6	44.1
	SD	24.8	26.3	24.6	11.6	17.6	22.8
High public self- consciousness	Mean	46.0	61.0	64.6	16.5	15.3	45.6
	SD	24.4	20.5	25.1	15.4	14.9	24.0
Low public self- consciousness	Mean	35.3	51.9	69.0	15.5	17.3	43.4
	SD	23.7	26.4	23.4	15.6	16.5	23.7

dimension. Neither treatment conditions nor private self-consciousness yielded significant differences,  $p > .50$ .

Coldness. A third retrospective measure was composed of a subjective rating of the coldness of the water. None of the treatment or personality factors reached statistical significance on this variable in the ANOVA,  $p > .40$  (see Table 6).

Cognitive Focus Measures. Four of the post-experimental measures asked subjects to estimate the percentage of their thoughts during hand immersion on trial two which were devoted to each of the following categories: (1) self, (2) instructions, (3) coldness, and, (4) other (i.e., something other than the aforementioned categories). The four percentages were required to add up to 100%. Each category was analyzed separately with a  $4 \times 2 \times 2$  ANOVA. The self category analysis showed significant differences between treatments,  $F(1,71) = 3.029$ ,  $p = .035$ . An examination of the treatment means suggests that the highest degree of self-focus was found in the mirror condition, followed by the camera, spot and control conditions (see Table 6). A post hoc analysis of this effect using the Tukey procedure indicates that the significant difference is between the mirror and control conditions,  $p < .05$ .

To further investigate the relationship between self-focus and the treatment manipulations, a second analysis was performed on the self-focus measure to determine which treatment condition(s) reported the highest percentage of self-focus in relation to the other cognitive focus categories (i.e., instructions, coldness and other). It was found that the mirror condition used the self category as the highest

percentage significantly more than the camera or control groups,  $Z = 2.3$ ,  $p < .05$ . However, no significant differences were found between the mirror and spot groups, the spot and control groups, the spot and the camera groups, nor the camera and control groups,  $p > .10$ .

The instructions category (see Table 6) showed a significant difference on the private self-consciousness dimension. Those low on the dimension tended to spend a greater proportion of time thinking about the instructions than those high on the dimension,  $F(1,71) = 4.37$ ,  $p = .04$ . The mean values for high and low private self-consciousness are 13% and 20% respectively. No other main or interaction effects were found to be significant,  $p > .20$ .

The cold response category (see Table 6) showed a marginal treatment effect ( $F(3,71) = 2.48$ ,  $p = .068$ ), which when analyzed using the Scheffé test was found to be present between the control and spot conditions,  $p < .10$ . The means for the mirror, spot, camera and control conditions are 41%, 38%, 44%, and 55% respectively. A treatment x private self-consciousness interaction was noted ( $F(3,71) = 3.7$ ,  $p = .016$ ) and analyzed with the Tukey procedure. The only significant difference was found between the control and camera conditions within the high private self-consciousness condition,  $p < .05$  (see Table 7). A tendency suggesting a treatment x public interaction ( $F(3,71) = 2.57$ ,  $p = .061$ ) failed to yield significant differences between pairs of means utilizing the Scheffé procedure. Finally, a treatment x private self-consciousness x public self-consciousness interaction was noted,  $F$

Table 7

Mean Percentage of Time Focused on Water Coldness

	<u>Private</u> <u>Self-Consciousness</u>		<u>Public</u> <u>Self-Consciousness</u>	
	High	Low	High	Low
Mirror	36.4 (N=11)	45.5 (N=11)	50.0 (N=10)	33.3 (N=12)
Spot	40.0 (N=10)	36.4 (N=11)	36.4 (N=11)	40.0 (N=10)
Camera	36.0 (N=10)	50.8 (N=12)	36.4 (N=11)	51.8 (N=11)
Control	68.0 (N=10)	43.3 (N=12)	60.0 (N=11)	49.1 (N=11)

(3,71) = 3.1,  $p = .032$  (see Table 8). No other main or interaction effects were found to be significant,  $p > .60$ .

A final analysis with the degree of focus on water coldness showed a relationship between this cognitive focus variable and the reported use of strategy ( $t(87) = -3.08, p = .003$ ). The means for strategy use versus non-use are 39.3% and 55.4% respectively. Thus, those who reported using a strategy on the second trial also reported focusing on the coldness of the water for a significantly smaller percentage of time than those who didn't report using a strategy. No interactions between strategy use and private or public self-consciousness were found.

The remaining cognitive content choice, the "other" category, showed no main or interaction effects,  $p > .10$ .

Strategy. The last of the post-experimental measures, the self-reported use or non-use of a cognitive strategy during the second trial of hand immersion yielded some interesting results. Over the entire population sample, 68% of the subjects reported having used a cognitive strategy,  $Z = 3.2, p = .001$ . No significant differences were found between treatment conditions,  $X^2 = 4.47, p = .22$  (see Table 9). High and low public self-consciousness subjects reported 65% and 71% strategy use respectively,  $Z = .5, p = .62$  (two tailed). As would be theoretically expected, high as compared to low private self-consciousness individuals employed a strategy significantly more often,  $Z = 1.9, p = .029$  (one-tailed). At the high end of this personality dimension, 78% of the subjects used a strategy in contrast to 59% of those at the low end of the dimension.

TABLE 8

Mean Percentage of Time Focused on Water Coldness

Private Self-Consciousness

	<u>High</u>		<u>Low</u>	
	<u>Public Self-Consciousness</u>		<u>Public Self-Consciousness</u>	
	Low	High	Low	High
Mirror	35.0 (N=6)	38.0 (N=5)	31.7 (N=6)	62.0 (N=5)
Spot	50.0 (N=4)	33.3 (N=6)	33.3 (N=6)	40.0 (N=5)
Camera	32.0 (N=5)	40.0 (N=5)	68.3 (N=6)	33.3 (N=6)
Control	64.0 (N=5)	72.0 (N=5)	36.7 (N=6)	50.0 (N=6)

Table 9

Strategy Use Versus Non-Use for All Subjects

	<u>Use of Strategy</u>	<u>Non-Use of Strategy</u>
Mirror	N = 16	6
Spot	15	6
Camera	17	5
Control	11	11

A binomial test examination of each of the treatment conditions in the high and low public self-consciousness groups as well as the low private self-consciousness group shows no significant differences (see Table 10) with respect to users and non-users of a cognitive strategy (two-tailed). On the other hand, the binomial test yielded significant user/non-user differences for the mirror and camera conditions in the high private self-consciousness subjects,  $p = .000$  and  $p = .001$  respectively (one-tailed). These results indicate that of the various treatment x personality combinations, only the high private self-consciousness dimension interacting with the self-awareness conditions (i.e., mirror and camera) were associated with significant user/non-user differences.

#### Personality Measures and Post-Experimental Probe

None of the primary scales of the Eysenck Personality Questionnaire (i.e., Extraversion, Neuroticism and Psychoticism) reached statistical significance between treatment conditions,  $p > .20$ . Furthermore, no significant differences were found for the Body Consciousness Scale measures (i.e., Private Body Consciousness and Public Body Consciousness) between treatment conditions,  $p > .20$ . These findings indicate that these personality factors did not differentially affect the treatment conditions (see Table 11).

Table 10

Frequency of Strategy Utilization

	<u>High</u> <u>Public Self-Consciousness</u>		<u>High</u> <u>Private Self-Consciousness</u>	
	Use of Strategy	Non-use of Strategy	Use of Strategy	Non-use of Strategy
Mirror	N = 7	3	11	0
Spot	8	3	7	3
Camera	9	2	10	0
Control	4	7	4	6

	<u>Low</u> <u>Public Self-Consciousness</u>		<u>Low</u> <u>Private Self-Consciousness</u>	
	Use of Strategy	Non-use of Strategy	Use of Strategy	Non-use of Strategy
Mirror	N = 9	3	5	6
Spot	7	3	8	3
Camera	8	3	7	5
Control	7	4	7	5

Table 11

Mean Scores on the EPQ and the Body-Consciousness Scale for Treatment Conditions

	Extraversion- Introversion	Neuroticism- Stability	Psychoticism	Private Body- Consciousness	Public Body- Consciousness	Body- Competence	
Mirror	<u>Mean</u>	12.9	11.4	2.3	13.5	15.8	9.4
	<u>SD</u>	4.4	4.7	1.5	3.4	3.9	3.5
Spot	<u>Mean</u>	15.3	11.1	2.7	12.2	16.7	10.5
	<u>SD</u>	4.9	4.1	1.7	3.8	3.7	3.1
Camera	<u>Mean</u>	13.7	10.6	1.8	13.2	15.8	9.6
	<u>SD</u>	4.7	5.8	1.7	3.5	5.3	2.5
Control	<u>Mean</u>	14.6	9.8	2.8	11.5	14.8	10.2
	<u>SD</u>	4.5	5.6	2.2	3.3	4.5	3.0

Following the experimental session, careful questioning of the subjects revealed that none of the subjects suspected the real purpose of the study nor detected the hidden camera in the experimental room.

#### Visual Contact with Stimulus

Visual time-on-target analysis served as both an instructional compliance measure and as a potential influencing factor with regard to the dependent variables. Since the treatment condition was not introduced until the second trial, the visual analysis was conducted during the three component parts of trial two: (1) the 60 seconds prior to hand immersion, (2) the first 30 seconds after hand immersion, and (3) the hand immersion time remaining from the end of the first 30 seconds to the point of hand withdrawal. Since the control condition did not include an object of focus, the visual measures were taken only on the three experimental conditions. The visual measures were taken by a hidden video camera which recorded the subjects' visual gaze patterns. These video recordings were later analyzed by two independent raters to establish the aforementioned visual measure values. The interrater reliability was greater than .99 for each of the three visual measures over the treatment conditions. Each visual measure was expressed in a score reflecting the proportion of time subjects were focused on the target during the respective time segments. The arc sin transformation was used as a standard operation prior to the analysis of

proportionality data, while the mean values of the visual measures are presented as untransformed proportions (see Table 12).

During the visual ratings, both raters noted considerable difficulty in scoring the amount of visual time-on-target for those subjects who withdrew their hands shortly after the required 30 second immersion period. A high degree of on-target/off-target visual vacillation was noted in many of these subjects. To investigate this problem, an ANOVA was conducted on this third visual time measure using the first three five-second time blocks subsequent to the first 30 seconds as three levels of the independent variable and the proportion of time-on-target as the dependent variable. The results of this analysis indicated a significant difference between those subjects who withdrew the hand during the first five-second time block and those subjects who withdrew their hands during either of the two subsequent five-second time blocks,  $F(2,30) = 8.15$ ,  $p = .001$ . The mean values for these three visual measure blocks were 26.2 ( $SD = 45$ ), 71.4 ( $SD = 16.4$ ) and 70 ( $SD = 19$ ). For these reasons, those subjects who withdrew the hand during the 30 to 35 second tolerance time period were dropped from these and all other experimental analyses.

The primary visual time analysis was a  $4 \times 2 \times 2 \times 3$  ANOVA with repeated measures on the last factor. As illustrated by Table 13, a treatment manipulation shows a significant effect,  $F(2,52) = 3.83$ ,  $p = .028$ . A post hoc analysis using the Scheffé procedure indicates that the camera and spot conditions did not differ from one another, but did differ from the mirror condition,  $p < .01$ . Both the camera and spot

Table 12

Mean Proportions on the Visual Focus  
Measures Across Treatment Conditions

		60-seconds prior to hand immersion	first-30-seconds of hand immersion	post first-30- seconds of hand immersion
Mirror	<u>Mean</u>	74.2	75.9	68.2
	<u>SD</u>	28.2	17.9	27.0
Spot	<u>Mean</u>	88.6	91.3	77.4
	<u>SD</u>	24.0	6.3	22.1
Camera	<u>Mean</u>	83.5	83.6	77.0
	<u>SD</u>	25.8	20.2	22.3
Combined condi- tions treatment	<u>Mean</u>	81.9	83.5	74.2
	<u>SD</u>	26.4	17.1	23.9

Repeated Measures ANOVA for the Visual Focus Measures

Source	Sum of Squares	Degrees of Freedom	Mean Square	F	Tail Prob.
Mean	1026.41	1	1026.41	1544.43	0.00
Treatment	5.09	2	5.09	3.82	0.03
Private	0.06	1	0.06	0.10	0.75
Public	1.03	1	1.03	1.55	0.22
TR	1.46	2	0.73	1.10	0.34
TP	0.46	2	0.23	0.35	0.71
RP	0.79	1	0.79	1.20	0.28
TRP	1.17	2	0.58	0.88	0.42
Error	34.56	52	0.66		
Z(1)	3.68	1	3.67	14.78	0.00
Z(1)T	0.38	2	0.19	0.77	0.47
Z(1)R	0.98	1	0.98	3.95	0.05
Z(1)P	0.00	1	0.00	0.01	0.92
Z(1)TR	2.19	2	1.10	4.41	0.02
Z(1)TP	0.34	2	0.17	0.68	0.51
Z(1)RP	0.44	1	0.44	1.76	0.19
Z(1)TRP	0.91	2	0.45	1.83	0.17
Error	12.94	52	0.24		
Z(2)	0.03	1	0.03	0.19	0.66
Z(2)T	0.05	2	0.02	0.13	0.88
Z(2)R	0.21	1	0.21	1.12	0.29
Z(2)P	0.02	1	0.02	0.12	0.73
Z(2)TR	0.28	2	0.14	0.75	0.48
Z(2)TP	0.82	2	0.41	2.22	0.12
Z(2)RP	0.06	1	0.06	0.35	0.56
Z(2)TRP	0.11	2	0.06	0.31	0.74
Error	9.59	52	0.18		
Z	3.71	2	1.85	8.57	0.00
ZT	0.43	4	0.11	0.50	0.74
ZR	1.19	2	0.59	2.74	0.07
ZP	0.02	2	0.01	0.06	0.94
ZTR	2.47	4	0.62	2.85	0.03
ZTP	1.15	4	0.28	1.33	0.26
ZRP	0.50	2	0.25	1.16	0.32
ZTRP	1.02	4	0.26	1.18	0.32
Error	22.53	104	0.21		

LEGEND: T = Treatment  
R = Private self-consciousness  
P = Public self-consciousness  
Z = Trial

groups focused on their respective targets significantly more than the mirror group (see Table 12). Another interesting finding in this analysis is shown by the orthogonal polynomial decomposition of the trial factor. The linear component of the polynomial proved to be the best equation to describe the trial factor. The trial means indicate a slight increase in the size of the proportion of time-on-target from the 60 seconds prior to hand immersion to the 30 second immersion period, followed by a decrease in the proportion of time on target during the post 30 second immersion period.

An analysis of each time segment separately showed a significant effect only on the 30 second time period during hand immersion (see Table 14). As may be seen, the treatment factor alone proved highly significant,  $F(2,52) = 5.16$ ,  $p = .009$ . A post hoc analysis using the Scheffé method showed once again that the camera and spot groups do not differ from one another, but are both significantly higher than the mirror group,  $p < .01$  (see Table 12). These separate analyses suggest that the primary difference in visual patterns between treatments resides in the first 30 second immersion period.

In concluding this section, it is of theoretical import to note that the three visual measures, both separately and combined, were used as covariates in the magnitude, tolerance and post experimental variable analyses and were found not to reach statistical significance in this capacity. This suggests that although differences exist between treatment conditions on the visual measures, these differences are not related to any of the output measures.

Table 14

ANOVA for the Proportion of Visual Focus During the  
First-Thirty-Seconds Immersion Period

Source	Sum of Squares	Degrees of Freedom	Mean Square	F	Tail Prob.
Mean	347.84	1	347.84	1759.86	0.00
Treatment	2.04	2	1.02	5.16	0.01
Private	0.04	1	0.04	0.25	0.61
Public	0.50	1	0.50	2.55	0.11
TR	0.87	2	0.44	2.21	0.12
TP	0.16	2	0.08	0.40	0.67
RP	0.09	1	0.09	0.48	0.49
TRP	0.31	2	0.16	0.80	0.40
Error	10.28	52	0.20		

LEGEND: T = Treatment  
R = Private self-consciousness  
P = Public self-consciousness

### Correlational Analyses

To further investigate the relationship between variables, a series of hierarchical stepwise multiple regression analyses were performed. Most of these regressions chose only one predictor variable with a .05 significance level cutoff criterion imposed, thus reducing the results to Pearson product-moment correlations. Table 15 displays the intercorrelations among personality variables across all four treatment conditions. The high correlation between the self-consciousness variables (private and public) and the body-consciousness variables (private and public) suggested the inclusion of only one set of these variables in any particular multiple regression analysis.

Table 16 shows the statistically significant relationships between the personality, dependent and post-experimental variables. Perhaps most noteworthy is the relationship between the body-consciousness measures and both the dependent (magnitude and tolerance) and two of the post-experimental measures (distress and first-pain). It should be noted however that the Body Consciousness Scale was administered at the end of the experimental session and thus may have been influenced by the experimental procedures. The public self-consciousness measure (administered several months prior to the experimental session), was also found to be significantly correlated with two of the post-experimental measures (distress and first-pain). This latter finding suggests that the body consciousness measures (especially public

Table 15

Intercorrelations Between Personality Measures

	Public self-consciousness	Private self-consciousness	Social anxiety	Public body consciousness	Private body consciousness	Body competence	Extraversion	Neuroticism	Psychoticism
Public self-consciousness		.10	.37**	.68**	.19*	.15	.18*	.47**	.07
Private self-consciousness			.06	.14	.39**	.20*	-.23**	.41**	.22*
Social anxiety				.14	.21*	-.26**	-.32**	.32**	-.25**
Public body consciousness					.39**	.32**	.19*	.35**	-.09
Private body consciousness						.15	-.06	.43**	-.14
Body competence							.41**	-.05	.19*
Extraversion								-.17	.06
Neuroticism									.00

\*  $p = \text{or} < .05$

\*\*  $p = \text{or} < .01$

Table 16

Intercorrelations Among the Personality Dependent and Post-Experimental Measures

	Private self-consciousness	Public self-consciousness	Private body consciousness	Public body consciousness	Body competence	Extraversion	Neuroticism	Psychoticism
First tolerance	-0.16	0.03	0.15	0.14	-0.10	-0.06	0.82	0.02
Second tolerance	-0.15	0.06	0.23*	0.23*	-0.09	-0.09	0.08	0.02
First magnitude	-0.06	0.17	0.20	0.22*	-0.03	-0.00	0.01	-0.13
Second magnitude	-0.01	0.08	0.24*	0.21*	0.03	-0.02	-0.03	0.10
Third magnitude	-0.03	0.18	0.21*	0.26*	-0.02	0.01	0.08	-0.02
Fourth magnitude	0.04	0.14	0.27**	0.27**	0.11	0.03	0.03	0.07
Distress	0.08	0.32**	0.34**	0.43**	.072	-0.05	0.17	-0.04
First-pain	0.05	0.24*	0.23*	0.26**	0.13	0.12	0.21*	0.03
Cold-rate	-0.05	0.00	0.10	-0.01	-0.07	-0.04	0.11	0.11
Cold-focus	0.01	0.06	0.05	0.07	-0.04	0.12	0.12	0.01
Self-focus	0.22*	0.05	0.19	0.14	0.03	-0.19	0.22*	-0.02
Instruction-focus	-0.20	-0.01	-0.08	0.09	-0.05	0.03	-0.03	-0.13
Other-focus	-0.02	-0.09	-0.12	-0.22	0.05	-0.01	-0.25	0.08

\*  $p = \text{or} < .05$   
 \*\*  $p = \text{or} < .01$

body consciousness) may also reflect an enduring personality disposition since the intercorrelations between the Self-Consciousness and Body Consciousness Scales in this study are consistent with those of prior research findings. Modest positive correlations suggest weak relationships between neuroticism and the post-experimental variables of first-pain experienced and cognitive focus on the self. A marginal negative correlation was also found between extraversion and the cognitive focus on the self. It should be taken into consideration that the highest of the correlations ( $r = .434$ ) accounts for only about 19% of the shared variance, thus suggesting caution in interpreting these results.

Table 17 shows the correlations between the dependent and post-experimental measures. The two tolerance measures are highly correlated, as are the intercorrelations among the magnitude measures. The magnitude and tolerance measures have somewhat lower intercorrelations. As may be noted, the tolerance measures are moderately correlated with the distress, first-pain, cold-rate and the cold-focus post-experimental variables. The magnitude measures on the other hand, show a number of relatively high correlations with the distress and first pain measures and weaker relationships to the cold-rate and cold-focus variables. Thus, it appears that the in vivo pain magnitude measures are more strongly related to retrospective pain and affective distress ratings than is tolerance, whereas tolerance shows a somewhat more robust association with stimulus quality ratings (cold-focus and cold-rate) than do the pain magnitude scores. Regarding

Table 17

Intercorrelations Among the Dependent and Post-Experimental Measures

	First tolerance	Second tolerance	First magnitude	Second magnitude	Third magnitude	Fourth magnitude	Distress	First-pain	Cold-rate	Cold-focus	Self-focus	In-struction focus	Other focus
First tolerance													
Second tolerance	0.85**												
First magnitude	0.51**	0.47**											
Second magnitude	0.62**	0.60**	0.43**										
Third magnitude	0.77**	0.78**	0.50**	0.55**									
Fourth magnitude		0.67**	0.70**	0.62**	0.79*								
Distress			0.66*	0.56**	0.65*	0.33**	0.33**	0.25*	0.34**	0.36**	-0.11	0.11	-0.36**
First-pain			0.61*	0.50**	0.66*	0.46**	0.46**	0.34**	0.41**	0.43**	-0.11	0.20	-0.48**
Cold-rate			0.46**	0.52**	0.61*	0.50**	0.52**	0.52**	0.23*	0.21*	-0.09	0.09	-0.21*
Cold-focus			0.56**	0.49**	0.66*	0.56**	0.49**	0.29**	0.23*	0.23*	-0.06	-0.02	-0.18
Self-focus			0.66*	0.65*	0.66*	0.65*	0.66*	0.33**	0.26**	0.26**	-0.03	0.12	-0.32**
Other focus			0.66*	0.66*	0.66*	0.66*	0.66*	0.39**	0.26**	0.33**	-0.04	0.07	-0.27**
			0.46**	0.46**	0.46**	0.46**	0.46**	0.20	0.39**	0.17	-0.05	-0.01	-0.35**
										0.44**	-0.12	0.06	-0.17
											-0.12	-0.01	-0.35**
											-0.39**	-0.12	-0.66**
												-0.19	-0.14

\* p = or < .05  
 \*\* p = or < .01

the relationships between the tolerance, magnitude and cognitive focus measures, only the cold and other focus variables show moderately significant correlations with tolerance durations and weak correlations with magnitude intensities. It therefore seems that with regard to the cognitive focus variables, the in vivo dependent measures (especially tolerance) are most related to whether or not subjects focused on the water coldness or on something other than the coldness, self or the instructions. What seems most important here with regard to the measurement of pain is the high relationship between the in vivo magnitude ratings and the two retrospective ratings of distress and first pain experienced. It is of added interest that both of these scales, the first concerned directly with affect and the second with pain magnitude, measure in vivo pain intensity to a similar degree. Regarding the post-experimental measure intercorrelations, it is noteworthy that the distress, cold-focus, cold-rate and other-focus variables are moderately intercorrelated, thus suggesting a logical consistency between retrospective intensity ratings and attentional focus measures. The highest correlation among post-experimental variables is between the first-pain and distress measures. Finally, it is interesting to note that affective distress is positively correlated with the percentage of time focused on water coldness and is unrelated to reported self-focus.

Individual Treatment Conditions - Personality vs. Dependent  
and Retrospective Measures

To further investigate the relationships among variables, each treatment condition was considered separately and analyzed using the hierarchical stepwise multiple regression procedure. Tables 18 through 21 display the intercorrelations between the personality variables and the dependent and post-experimental measures for the four treatment and control conditions. In examining the relationships between the personality, and in vivo dependent measures (tolerance and magnitude), an initial sampling bias is noted. The different correlational patterns between conditions are spurious, considering that they also appear on the first trial measures (i.e., first tolerance and first and second magnitudes), prior to the introduction of a treatment manipulation.

Regarding the relationships between the personality measures and the post-experimental variables, no overall pattern is evident between treatment conditions. However, it is interesting that most of the significant correlations are found in the control condition. Both the first-pain and cold-focus measures show moderately high positive correlations with the self-consciousness and body consciousness measures. Furthermore, these same personality measures are negatively correlated with the other focus category. That is, as self-consciousness and body consciousness increase, there is less tendency for subjects to focus on things other than the remaining presented cognitive categories.

Table 18

## Personality vs Dependent and Post-Experimental Measures: Mirror Condition

	First tolerance	Second tolerance	Third magnitude	Fourth magnitude	Distress pain	First- rate	Cold- focus	% Self- focus	% Inst. focus	% Other focus	
Private self-consciousness	-.56 p=.006	-.30 p=.18	-.43 p=.05	-.36 p=.10	-.05 p=.83	-.40 p=.07	-.08 p=.71	-.19 p=.39	.21 p=.36	-.24 p=.28	.19 p=.41
Public self-consciousness	+.19 p=.40	+.18 p=.40	+.55 p=.008	.45 p=.04	.40 p=.06	.14 p=.54	-.14 p=.53	.44 p=.04	.22 p=.34	-.19 p=.40	-.47 p=.03
Private body consciousness	+.21 p=.36	+.36 p=.09	+.19 p=.39	+.43 p=.04	.33 p=.13	.41 p=.06	.03 p=.88	-.21 p=.35	.12 p=.60	.13 p=.60	.00 p=1.0
Public body consciousness	.03 p=.91	+.07 p=.74	+.23 p=.31	+.39 p=.07	.29 p=.10	.003 p=1.0	-.16 p=.47	-.25 p=.27	.46 p=.03	.09 p=.70	-.21 p=.34
Body competence	-.13 p=.57	-.11 p=.32	-.15 p=.50	.09 p=.70	-.20 p=.38	.13 p=.60	-.21 p=.35	-.33 p=.06	.33 p=.14	.14 p=.52	-.06 p=.80
Extraversion	.13 p=.57	+.28 p=.21	.02 p=.98	.10 p=.67	-.15 p=.50	.41 p=.06	-.30 p=.17	.07 p=.75	-.01 p=.96	.07 p=.79	-.11 p=.64
Neuroticism	-.03 p=.89	+.06 p=.80	.17 p=.46	.22 p=.33	.41 p=.06	.14 p=.46	-.11 p=.64	.19 p=.39	.36 p=.10	-.21 p=.34	-.33 p=.13
Psychoticism	-.09 p=.70	-.14 p=.54	-.28 p=.21	-.10 p=.46	-.006 p=.98	-.30 p=.18	-.20 p=.37	.03 p=.88	.19 p=.40	-.38 p=.08	.08 p=.72

Table 19

Personality vs Dependent and Post-Experimental Measures: Spot Condition

	First tolerance	Second tolerance	First magnitude	Second magnitude	Third magnitude	Fourth magnitude	Distress pain	Cold-rate	& Cold-focus	& Self-focus	& Inst. focus	& Other focus	
Private self-consciousness	-.20 p=.37	-.13 p=.60	-.05 p=.83	+.23 p=.32	.21 p=.37	.36 p=.11	.42 p=.06	.31 p=.17	.08 p=.74	-.02 p=.93	.08 p=.72	-.39 p=.08	.24 p=.30
Public self-consciousness	-.16 p=.48	-.10 p=.66	+.20 p=.39	+.08 p=.72	.03 p=.88	.32 p=.16	.35 p=.13	.08 p=.75	-.20 p=.39	-.11 p=.75	-.10 p=.66	-.05 p=.83	.15 p=.52
Private body consciousness	-.01 p=.95	.01 p=.95	-.02 p=.92	+.19 p=.40	.12 p=.61	.27 p=.24	.40 p=.07	.33 p=.14	.17 p=.47	.17 p=.47	.22 p=.33	-.37 p=.10	.04 p=.88
Public body consciousness	-.09 p=.70	-.08 p=.74	+.22 p=.35	+.25 p=.27	.28 p=.22	.41 p=.06	.65 p=.002	.36 p=.11	-.19 p=.40	-.16 p=.49	.07 p=.77	-.12 p=.62	.16 p=.49
Body competence	-.26 p=.25	-.32 p=.16	+.04 p=.86	+.13 p=.56	.15 p=.51	.37 p=.10	.51 p=.02	.38 p=.09	-.32 p=.16	-.26 p=.26	-.20 p=.37	-.27 p=.24	.44 p=.04
Extraversion	-.42 p=.06	-.35 p=.12	-.12 p=.62	-.26 p=.26	-.09 p=.70	-.04 p=.86	-.02 p=.93	.10 p=.67	-.32 p=.16	-.13 p=.58	-.11 p=.65	-.05 p=.82	.17 p=.47
Neuroticism	+.09 p=.71	+.21 p=.36	-.03 p=.91	-.02 p=.94	-.004 p=.99	.10 p=.67	.10 p=.66	.21 p=.35	.44 p=.05	.53 p=.01	.03 p=.90	.03 p=.89	-.40 p=.07
Psychoticism	+.06 p=.79	.28 p=.21	-.01 p=.96	+.21 p=.36	.25 p=.28	.30 p=.18	.25 p=.28	.14 p=.55	.45 p=.04	.30 p=.18	-.13 p=.56	-.09 p=.70	-.09 p=.69

Table 20

Personality vs Dependent and Post-Experimental Measures: Camera Condition

	First tole- rance	Second tole- rance	First magni- tude	Second magni- tude	Third magni- tude	Fourth magni- tude	Distress pain	First- rate	Cold- rate	Cold- focus	Self- focus	Inst. focus	Other focus
Private self- consciousness	+ .25 p=.27	-.27 p=.23	-.12 p=.59	-.22 p=.33	-.01 p=.95	-.06 p=.78	-.18 p=.44	-.01 p=.95	-.42 p=.05	-.36 p=.10	.52 p=.01	-.06 p=.79	.06 p=.79
Public self- consciousness	+ .04 p=.95	+ .07 p=.76	-.02 p=.96	+ .03 p=.88	-.07 p=.74	.03 p=.88	.21 p=.34	.09 p=.70	-.11 p=.32	-.21 p=.56	-.07 p=.75	.14 p=.54	.19 p=.40
Private body consciousness	+ .11 p=.63	+ .13 p=.40	+ .03 p=.89	+ .00 p=1.0	.04 p=.87	.09 p=.71	.15 p=.49	-.18 p=.42	-.19 p=.40	.18 p=.94	.05 p=.81	.07 p=.75	-.11 p=.64
Public body consciousness	+ .15 p=.51	+ .29 p=.18	+ .15 p=.51	+ .07 p=.75	.13 p=.56	.14 p=.53	.30 p=.17	.04 p=.84	-.19 p=.39	.18 p=.42	-.22 p=.32	.19 p=.39	-.17 p=.45
Body competence	+ .03 p=.90	-.17 p=.43	+ .07 p=.76	+ .08 p=.74	-.14 p=.54	-.11 p=.64	-.21 p=.34	-.18 p=.42	.00 p=1.0	.04 p=.87	-.07 p=.74	-.35 p=.12	.24 p=.29
Extraversion	-.01 p=.97	-.24 p=.28	+ .01 p=.95	.00 p=1.0	-.21 p=.35	-.30 p=.18	-.27 p=.23	-.17 p=.45	.12 p=.60	.24 p=.27	-.34 p=.12	-.14 p=.53	.07 p=.76
Neuroticism	-.03 p=.90	.07 p=.74	-.27 p=.20	-.19 p=.41	-.09 p=.67	.00 p=1.0	-.02 p=.95	.09 p=.70	-.22 p=.33	-.25 p=.26	.22 p=.31	.08 p=.74	.07 p=.76
Psychoticism	+ .03 p=.89	-.10 p=.67	-.21 p=.36	+ .06 p=.78	-.43 p=.04	-.19 p=.40	-.26 p=.24	-.29 p=.19	.14 p=.53	-.06 p=.80	.07 p=.74	-.36 p=.10	.24 p=.28

Table 21

## Personality vs Dependent and Post-Experimental Measures: Control Condition

	First tolerance	Second tolerance	First magnitude	Second magnitude	Third magnitude	Fourth magnitude	Distress	First-pain	Cold-rate	& Cold-focus	& Self-focus	& Inst. focus	& Other focus
Private self-consciousness	+ .34 p=.12	+ .28 p=.21	+ .19 p=.40	+ .33 p=.13	.04 p=.85	.21 p=.35	.12 p=.59	.23 p=.31	.12 p=.59	.53 p=.01	-.02 p=.93	-.17 p=.46	-.49 p=.02
Public self-consciousness	+ .10 p=.65	+ .14 p=.54	+ .14 p=.55	-.04 p=.88	.25 p=.26	-.13 p=.57	.32 p=.15	.56 p=.006	.31 p=.16	.22 p=.32	.23 p=.29	.02 p=.92	-.36 p=.10
Private body consciousness	+ .36 p=.10	+ .45 p=.04	+ .44 p=.04	+ .45 p=.04	.50 p=.02	.39 p=.08	.40 p=.07	.46 p=.03	.20 p=.38	.40 p=.07	.18 p=.42	-.21 p=.34	-.41 p=.06
Public body consciousness	+ .45 p=.04	+ .54 p=.01	+ .25 p=.26	+ .25 p=.26	.37 p=.09	.22 p=.33	.51 p=.01	.56 p=.007	.30 p=.18	.45 p=.04	.32 p=.14	.10 p=.65	-.70 p=.000
Body competence	-.02 p=.94	+ .15 p=.50	-.08 p=.71	-.05 p=.82	-.005 p=.98	.02 p=.93	.20 p=.38	.07 p=.77	.23 p=.30	.32 p=.15	.01 p=.95	.21 p=.35	-.46 p=.03
Extraversion	+ .05 p=.81	+ .20 p=.37	+ .18 p=.42	+ .09 p=.70	.25 p=.27	.23 p=.31	.16 p=.47	.07 p=.75	.31 p=.16	.23 p=.30	.19 p=.39	.30 p=.18	-.32 p=.14
Neuroticism	+ .07 p=.79	+ .02 p=.94	+ .19 p=.39	-.01 p=.96	.20 p=.39	-.15 p=.50	.11 p=.62	.35 p=.11	.25 p=.27	.36 p=.10	.10 p=.66	-.10 p=.65	-.39 p=.08
Psychoticism	+ .01 p=.96	-.04 p=.84	+ .03 p=.91	+ .11 p=.62	.18 p=.42	.11 p=.62	-.07 p=.76	.23 p=.30	.11 p=.64	-.14 p=.53	-.13 p=.55	.17 p=.45	.13 p=.58

Several other significant correlations involve self-focus, in relation to self and body consciousness. The mirror condition shows a moderate positive correlation between public body consciousness and self-focus, while no significant relationships were found between self-focus and the self-consciousness or private body consciousness measures. This is unexpected in that theoretical formulations would predict that private self and body consciousness would covary with a focus on self-aspects. In this experimental situation where the predominant self-aspects are private bodily sensations, which are presumably amplified by the mirror exposure, it is surprising that the suggested self-focus is associated most with public bodily aspects.

In the camera condition a significant relationship was noted between private self-consciousness and self-focus. This finding is interesting in that private self-consciousness rather than public self-consciousness covaries with self-focus in this public self-awareness manipulation (i.e., the camera). Neither private nor public body consciousness correlates with self-focus. This latter finding is somewhat surprising since it would seem that the self-aspects focused upon in the experimental situation would most likely be bodily aspects. Thus it would be expected that body consciousness scores, whether they represent an enduring personality state or reflect the degree of pain experienced during the experimental situation, would covary with the cognitive self-focus measure.

Finally, the spot condition yields a significant finding for the multiple regression analysis in the prediction of cold-rate, with EP

(psychoticism) entered on the first step, followed by body-competence and EN (neuroticism),  $R^2 = .44$ . Neuroticism was also found to be significantly related to cold-focus in the spot condition.

Individual Treatment Conditions-Dependent and  
Post-Experimental Measures

Each condition, as shown in Tables 22 through 25, show high correlations between the first and second tolerance measures and among the magnitude measures. Moderate to high intercorrelations are noted between the tolerance and magnitude measures in each condition. In examining the relationships between the dependent measures (magnitudes and tolerances) and post-experimental variables, most of the significant correlations are found in the control condition. The distress, first-pain, cold-rate, and cold-focus measures show the greatest number of moderately significant associations with tolerance and magnitude scores in the control condition, while only the distress and first-pain measures are significantly related to magnitude scores in all conditions. The camera condition shows moderate negative correlations between the self-focus and tolerance measures, suggesting that as speed of termination of hand immersion increases, the percentage of time focusing on the self decreases.

Regarding the intercorrelations among post-experimental variables, once again most of the significant and strongest relationships are found in the control condition. In examining the correlations between the four

Table 22

Intercorrelations Between the Dependent and Post-Experimental Measures  
for the Mirror Treatment Condition

	First tolerance	Second tolerance	First magnitude	Second magnitude	Third magnitude	Fourth magnitude	Distress	First-pain	Cold-rate	% Cold-focus	% Self-focus	% In-struction focus	% Other focus
First tolerance	0.91**	0.38	0.61**	0.33	0.49*	0.25	0.14	0.08	0.32	0.04	0.10	-0.41	
Second tolerance		0.42	0.60**	0.43*	0.51*	0.35	0.29	-0.03	0.32	-0.07	0.16	-0.36	
First magnitude			0.72**	0.74**	0.75**	0.51**	0.55**	0.06	0.17	-0.26	0.24	-0.12	
Second magnitude				0.70**	0.92**	0.64**	0.61**	0.26	0.26	-0.02	-0.09	-0.17	
Third magnitude					0.80**	0.64**	0.59**	0.25	0.42	-0.28	0.09	-0.23	
Fourth magnitude						0.65**	0.64**	0.22	0.29	-0.11	0.01	-0.19	
Distress							0.39	0.31	0.55**	-0.01	-0.11	-0.44*	
First-pain								0.23	0.21	-0.17	0.11	-0.13	
Cold-rate									0.14	-0.10	-0.03	-0.03	
% Cold focus										-0.26	-0.17	-0.62**	
% Self-focus											-0.41	-0.30	
% Instruction focus												-0.22	

\*  $p = \text{or} < .05$   
 \*\*  $p = \text{or} < .01$

Table 23

Intercorrelations Between the Dependent and Post-Experimental Measures  
for the Spot Treatment Condition

	First tolerance	Second tolerance	First magnitude	Second magnitude	Third magnitude	Fourth magnitude	Distress	First- pain	Cold- rate	% Cold- focus	% Self- focus	% In- struction focus	% Other focus
First tolerance	0.88**		0.59**		0.37	0.30	0.19	0.28	0.43*	0.17	0.10	0.04	-0.18
Second tolerance		0.61**	0.43*	0.56**	0.49*	0.43	0.20	0.32	0.68**	0.37	0.10	0.18	-0.41
First magnitude			0.73**		0.70**	0.67**	0.50*	0.40	0.20	-0.07	0.29	-0.01	-0.06
Second magnitude				0.55**	0.67**	0.67**	0.58**	0.26	0.23	-0.18	0.33	-0.15	0.08
Third magnitude					0.78**	0.78**	0.71**	0.60**	0.38	0.21	0.30	0.06	-0.31
Fourth magnitude						0.76**	0.76**	0.63**	0.16	0.10	0.19	0.05	-0.19
Distress							0.42	0.42	-0.05	-0.07	0.27	-0.14	0.02
First-pain								0.23	0.23	0.22	-0.03	0.13	-0.22
Cold-rate										0.60**	0.08	0.12	-0.53*
% Cold-focus											-0.21	0.21	-0.73**
% Self-focus												-0.29	-0.09
% Instruction focus													-0.69**

\* p = or .05  
\*\* p = or .01



Table 25

Intercorrelations Between the Dependent and Post-Experimental Measures  
for the Control Treatment Condition

	First tolerance	Second tolerance	First magnitude	Second magnitude	Third magnitude	Fourth magnitude	Distress	First- pain	Cold- rate	% Cold- focus	% Self- focus	% In- struction focus	% Other focus
First tolerance		0.90**	0.63**	0.77**	0.62**	0.78**	0.55**	0.37	0.60**	0.53*	0.00	-0.15	-0.51*
Second tolerance			0.72**	0.80**	0.76**	0.84**	0.70**	0.50*	0.63**	0.58**	-0.01	-0.09	-0.58**
First magnitude				0.84**	0.87**	0.71**	0.56**	0.59**	0.66**	0.59**	-0.32	-0.33	-0.33
Second magnitude					0.80**	0.92**	0.56**	0.61**	0.54**	0.58**	-0.34	-0.35	-0.29
Third magnitude						0.78**	0.72**	0.72**	0.72**	0.46*	-0.18	-0.14	-0.35
Fourth magnitude							0.62**	0.48*	0.56**	0.45	-0.15	-0.24	-0.30
Distress								0.57**	0.77**	0.56**	0.02	-0.10	-0.57
First-pain									0.40	0.43*	-0.22	-0.29	-0.23
Cold-rate										0.65**	-0.17	-0.16	-0.56**
% Cold-focus											-0.39	-0.30	-0.76**
% Self-focus												0.10	-0.09
% Instruction focus													-0.24

\* p = or < .05

\*\* p = or < .01

cognitive measures and the remaining post-experimental variables (distress, first-pain and cold-rate), most of the significant relationships are noted in the control condition between the cold and other focus measures and the distress, first-pain and cold-rate variables.

In conclusion, it may be said that although the control condition appears to yield stronger relationships between the magnitude, tolerance and post-experimental measures, these findings must also be considered within the context of the magnitude and tolerance data from the first trial. An examination of these pre-treatment data indicates an initial sampling bias. That is, the relationships in question show consistently higher correlations over the pre-treatment and treatment (first and second) trials in the control condition in relation to the three experimental conditions.

#### Visual-Measure Correlational Analysis

This final section of the correlational analyses focuses on the relationships found among the visual time-on-target measures, the magnitude and tolerance measures and the post-experimental variables. An analysis of the mirror, spot and camera conditions combined yielded no significant relationships with respect to the above variables. The individual conditions analyses are shown in Table 26. These relationships were also analyzed using non-parametric statistics (Spearman-rho) since a number of extreme scores were found to bias some

Table 26

Intercorrelations of the Visual vs the Dependent and  
Post-Experimental Measures

	Third magnitude	Fourth magnitude	First- pain	Cold- rate	Instruction	PRSEC60	PRSEC30	PRPLUS30
PRSEC60	.05	.09	.31	MIRROR -.33	.02		.48*	.24
PRSEC30	-.04	.03	.23	-.53**	.12			.60
PRPLUS30	-.02	-.10	.12	-.15	-.12			
TOTAL	.003	.004	.28	-.39	-.008			
PRSEC60	.12	.23	.25	SPOT -.13	-.44		.17	.55**
PRSEC30	-.33	-.03	.21	-.12	-.06			.14
PRPLUS30	-.20	-.12	.34	-.35	-.65**			
TOTAL	-.09	.09	.07	-.28	-.60**			
PRSEC60	-.25	-.22	-.42	CAMERA .09	-.07		.62	.34
PRSEC30	-.39	-.21	-.47	.45	.29			.32
PRPLUS30	-.58**	-.49*	-.63**	.39	-.29			
TOTAL	-.51*	-.39	-.64**	.37	-.02			

\*  $P < .05$ \*\*  $P < .01$ 

PRSEC60 - Proportion of on-target visual focus during the sixty seconds prior to hand immersion.

PRSEC30 - Proportion of on-target visual focus during the first thirty seconds of hand immersion.

PRPLUS30 - Proportion of on-target visual focus consequent to the first thirty seconds of hand immersion.

of the Pearson correlations. The presented correlations were thus considered significant only if, in addition to being significant with the Pearson statistic, they also were found to reach significance with the Spearman-rho procedure.

Mirror. In the mirror condition, the only significant correlations were between the second visual time-on-target measure (PRSEC30) and cold-rating variable, and secondly between the first (PRSEC60) and second (PRSEC30) visual time-on-target measures. Thus, a greater visual contact time during the first 30 seconds of hand immersion was associated with a lower rating of the water coldness.

Spot. The spot condition also shows only two significant correlations. The post 30 second visual time-on-target measure was found to be negatively associated with the degree of cognitive focus on the experimental instructions. The second significant correlation was noted between the first and third visual time-on-target measures (PRSEC60 and PRPLUS30).

Camera. The camera condition is perhaps the most interesting since no significant correlations were found among the visual measures, but three significant negative correlations were noted between the third visual measure (PRPLUS30) and the two magnitude ratings as well as the first pain rating. Thus it appears that an inverse relation exists between how much time subjects observe the camera and both the rated magnitude of pain measures and the rating of pain intensity when first experienced.

The combined visual measures (Total), which may be considered an overall indication of compliance with instructions to observe the treatment stimulus, show similar patterns in each of the treatment conditions. This suggests that although only one of the visual measures in each treatment condition is significantly correlated with particular dependent and post-experimental variables, the remaining visual measure relationships are strong enough and in the same direction, so that in combination all the visual measures maintain a similar configuration.

## Chapter IV

### DISCUSSION

The primary purpose of the present research was to investigate the personality dimensions of private and public self-consciousness and the induced states of private and public self-awareness in relation to experimentally induced pain.

#### Primary Dependent Measures

The tolerance measure, that is the speed of termination of hand immersion, was found not to differ between treatment groups or public self-consciousness levels. However, a marginal difference between private self-consciousness levels suggests that those individuals high in private self-consciousness tended to tolerate the ice water stress for a longer time period than those low on this personality dimension. Although this effect was statistically marginal, it was the opposite of what was predicted by self-consciousness theory. A possible explanation for this unexpected finding may be found in the tendency of high private self-consciousness subjects to use a strategy more than those low on the dimension. That is, when the high and low private self-consciousness differences in the tolerance measure were further analyzed by examining the distribution of strategy users in each group, the results suggest that the largest proportion of strategy users were found in the high

private self-consciousness group. This group of high private self-consciousness strategy users was found to have lower average termination speed scores than the high private self-consciousness non-users of a strategy and the low private self-consciousness strategy user and non-user groups.


The question of why high private self-consciousness subjects tended to use a strategy more than those low in private self-consciousness and furthermore why those "highs" who did use a strategy terminated hand immersion later than "lows" using a strategy, may be addressed by referring to self-consciousness theory. Self-consciousness theory holds that high private self-consciousness is associated with an internally reflective tendency and self-knowledge to a higher degree than is low private self-consciousness. Thus it is not surprising that high private self-consciousness subjects with their greater familiarity with internal self-aspects would be more inclined than those low on the trait to engage in mental manipulations to reduce stress. Furthermore, because of their more frequent "contact" with internal, private self-aspects, high private self-consciousness individuals may prove more successful in using stress reducing strategies.

Concerning the more marginal differences noted between high private self-consciousness strategy users and the non strategy users in high and low private self-consciousness subjects, the present data offer no definitive explanation. It is unclear from the reported non use of a strategy what these particular subjects may have been thinking about during hand immersion. Some researchers have found that while some

subjects exposed to experimentally induced pain attempted to cope by use of a spontaneously produced strategy, others tended to catastrophize (Spanos, Brown, Jones, & Horner, 1981; Spanos, Stam, & Brazil, 1981). Catastrophizing is a term which has been used to refer to the tendency of subjects to focus on and exaggerate the aversive aspects of a situation. Since the concept of private self-focus, both at a situational and trait level, theoretically entails an amplification of the noxious elements of experienced pain, it may prove fruitful to investigate possible relationships between private self-focus and the tendency catastrophize.

Another reason why the non significant differences between the high private self-consciousness strategy users and the non strategy user groups are difficult to interpret is the relatively small number of subjects in the latter groups. This smaller subject sample increases the probability of not recognizing significant differences where they may exist (i.e., a Type II error). It is noteworthy however that the two relationships in question were analyzed using a non-directional test (i.e., two-tailed), and both would have reached significance at the five percent level if a directional test (i.e., one-tailed) had been employed.

In summary, the results suggest that the tolerance measure for the second trial was influenced by both strategy use and the level of private self-consciousness. However, because these relationships are relatively weak, more investigation is necessary before drawing firm conclusions.



The second primary dependent variable, pain magnitude ratings, shows no significant differences between treatment conditions, nor between private or public self-consciousness. The question of why the tolerance measure showed small significant differences between levels of the private self-consciousness dimension while the magnitude ratings did not, led to an investigation of the relationship between these two dependent variables. The correlations between the magnitude and tolerance measures for all subjects were moderately high, accounting for between 26 and 38 percent of the variance for the first and second magnitude rating of each trial, respectively. These results suggest that pain magnitude ratings taken temporally closer to hand immersion termination more accurately reflect tolerance time than those taken earlier. On the other hand, the relationship may be a statistical artifact resulting from the instructional restriction on hand withdrawal prior to the 30 seconds rating. However, since no magnitude ratings were taken at the time of immersion termination, it is unclear from the present data if the positive relationship between tolerance time and pain magnitude would continue to increase beyond the 30 seconds rating (i.e., the second and fourth magnitudes). A number of researchers have pointed out the cyclical nature of pain and the concomitant measuring difficulties. Stam, Petrusic and Spanos (1981), point out that cold-pressor pain peaks at about 60 seconds, reduces and then continues to increase at various intervals. Therefore, an immersion time beyond 60 seconds presents difficulties in interpretation. Furthermore, some researchers have found no relationship between tolerance measures and

discomfort evaluations made on category rating scales (e.g., Avia & Kanfer, 1980). In consideration of the aforementioned facts it is not unusual that the magnitude and tolerance measures showed different relationships to the personality variable in question (private self-consciousness).

#### Post-Experimental Variables

The post-experimental measures generally showed as little variability due to treatment manipulations as did the magnitude and tolerance measures. The percentage of variance of the post-experimental measures which may be attributed to treatment manipulations ranges from 2% to 10%. The only two post-experimental variables which showed marginal to modest treatment effects are the self-focus and cold-focus measures. The self-focus measure was a manipulation check used to determine if self-focused attention was greater in the self-awareness conditions (i.e., mirror and camera). The self-focus results suggest that mirror presence is associated with more time during which attention is self-directed than was found in the control group, but not more than in the spot group. One of the self-focus analyses also suggests that the mirror condition leads to more self-focus than the camera exposed subjects. Self-focus did not differ significantly over either private or public self-consciousness levels but was found to be modestly correlated with private self-consciousness, especially in the camera condition. Thus it seems that the prediction that mirror exposure and high private

self-consciousness would lead to greater self-focus than non self-relevant situations and low private self-consciousness is only weakly supported by the present research.

In considering the relative weakness of the self-focus results it is important to remember that when a manipulation check is made on self-focus, it is typically indirect (e.g., the frequency use of personal pronouns), in contrast to the present research where subjects were asked directly about their self-focus. At the present time not enough research has been conducted on the validity of different methods of assessing self-focus to draw firm conclusions regarding this issue. Furthermore the relationship between self-focus and experimentally induced stress is unclear. Some researchers propose that self-awareness may result from increased physiological arousal (Wegner & Giuliano, 1980), while others hold that performing unusual behavior leads to higher self-awareness (McDonald, Harris, & Maher, 1983). Since the cold-pressor test is likely to be arousing and is certainly unusual, the manipulation in itself may increase self-awareness. However, the same comments may be made with regard to many psychological experiments, which have demonstrated clear self-focus effects. Thus it cannot be said that the arousing and novel aspects of the stressor in the present research necessarily presents a ceiling problem in relation to possible self-focus effects.

The second post-experimental variable to show differences over treatment conditions was the cold-focus measure. The marginally significant effect suggests that focusing on the non self-relevant

stimulus in this situation (spot) is associated with less focus on water coldness than if no visual stimulus is present. Although this effect is unrelated to self-consciousness theory, the lower mean values of cold-focus for the three experimental conditions suggest that subjects tend to focus less on water coldness if they are looking at something. However, as mentioned earlier, this mean value pattern is not found in any of the magnitude, tolerance or other post-experimental measures. Thus there appears to be no relationship between focusing on water coldness and other response measures with regard to the stimulus being observed.

The second finding with regard to the cold-focus variable indicates that high private self-consciousness subjects in the presence of a camera focus less on water coldness than those in the control condition. Although this finding is consistent with theoretical formulations in that public self-awareness conditions would be likely to be associated with a decrease in cold-focus over a non-focus control condition, neither of these conditions show significantly different cold-focus scores from all the remaining treatment groups in both high and low private self-consciousness. Therefore the evidence for cold-focus ratings being affected by either the treatment conditions or the self-consciousness dimensions is relatively weak.

A final point of interest noted with the cold-focus measure concerns the reported use of a strategy. Like the tolerance change scores, the cold-focus measure is significantly associated with strategy use. Those subjects reporting use of a strategy also reported less of a

focus on coldness during hand immersion. The explanation for this finding is however unclear. The use of a strategy may have reduced the experience of coldness and thus the reported focus on coldness. However, this seems unlikely since the coldness magnitude retrospective ratings show no differences between strategy users and non-users. What may more likely be the case is that strategy use rather than thoughts of water coldness occupied cognitive space, thus leading to a reported lower percentage time focusing on water coldness.

Regarding the relationships between the self-consciousness dimensions and the post-experimental measures, only the first-pain, focus-on-instructions and strategy use showed statistically significant differences over levels of these personality traits. The first-pain measure yielded different values over levels of public self-consciousness, with those subjects high on the dimension reporting the greater intensities. In examining the individual treatment conditions, the only significant relationship between public self-consciousness and the first-pain variable was found in the control condition. No particular theoretical significance can be attributed to this latter finding. Furthermore, considering the initial sampling bias, as manifested in the first trial (non-manipulation) magnitude and tolerance measures across conditions, this post-experimental result may also be spurious. The distress-scale measure, although statistically non-significant, showed differences over public self-consciousness in the same direction as the first-pain measure.

The first-pain variable also showed a negative relationship with private self-consciousness in the mirror condition, while the distress variable was found to be positively related to private self-consciousness in the spot condition. The two aforementioned findings only tended towards significance, and thus may be spurious. These two measures also relate to private self-consciousness in opposite directions, and yet are found to be positively correlated with one another in all conditions, lending further evidence to the contention that these particular results concerning private self-consciousness are spurious.

With regard to the first-pain and distress measures in relation to public self-consciousness, these findings are consistent in that they both show positive correlations. However it is contrary to theoretical expectations that public self-consciousness is positively associated with the two retrospective pain and affective distress measures. Self-consciousness theory holds that high public self-consciousness people, in order to present a favorable social image, would be likely to report lower pain levels. Furthermore, self-consciousness theory states that public self-consciousness should only be activated in the presence of a public self-awareness inducer (e.g., a video camera). In the present study the only significant correlation between public self-consciousness and a post-experimental variable (first-pain) was found in the control condition.

Regarding the differences between the first-pain and distress measures in relation to high and low public self-consciousness, an

interesting comparison may be made to a study by Kleck, Vaughn, Cartwright-Smith, Vaughn, Colby, and Lanzetta (1976). These authors found that male subjects who were observed by an audience while receiving electric shocks rated the experienced pain as lower than when they were alone. Although these results appear inconsistent with the present findings, it may be of significance that Kleck et al. employed a male population while the present study used female subjects. These gender differences in the subject populations would be expected to lead to a different valuation of "toughness" with regard to pain tolerance. Males would likely be expected to present a positive social image by reporting less pain in the presence of an audience, while females would probably be less concerned with this. From this perspective it is thus not surprising that the females in the present study did not report lower pain measures in the high public self-consciousness or self-awareness (camera) groups. However, it remains unclear why there appears to be a positive relationship between these two retrospective pain measures and public self-consciousness.

The focus-on-instructions and strategy use measures were both found to be associated with private self-consciousness. Higher private self-consciousness subjects tended to use a strategy more and to spend less time attending to the experimental instructions than those low on the scale. Furthermore, high private self-consciousness subjects in the self-awareness conditions (i.e., mirror and camera exposure) demonstrated the highest reported strategy use. These findings in conjunction with the positive relationship between private

self-consciousness and self-focus suggest that those individuals high in private self-consciousness may be more internally oriented with regard to self-aspects and stress reduction strategies and less concerned with attending to the task instructions. However since no significant relationships were noted between strategy use and these two cognitive focus variables, this hypothesis remains at a speculative level.

Regarding the relationships between the EPQ and the post-experimental measures, only one correlation reached the adopted level of significance ( $p = .05$ ) and two others approached statistical significance. The neuroticism scale showed a positive relationship to self-focus at a level of significance comparable to private self-consciousness. This finding is consistent with the significant relationship between neuroticism and private self-consciousness. The marginal relationship between neuroticism and the first pain measure is in the same direction as Lynn and Eysenck's (1961) findings in that as neuroticism increases, the intensity of experienced pain also increases. However, considering the lack of correlational significance between neuroticism and the magnitude, tolerance or distress measures and the marginal statistical level of the first-pain versus neuroticism correlation, the relationship between neuroticism and pain in the present research is only weakly suggestive.

The extraversion scale was found to be negatively related to self-focus at a statistically marginal level. This finding in conjunction with the negative relationship found between extraversion and private self-consciousness and the positive relationship between

private self-consciousness and self-focus suggests that the self-focus results validly reflects behavioral tendencies associated with particular personality types. However, once again the low level of statistical significance between self-focus and the personality measures requires caution in drawing firm conclusions.

The body consciousness measures were found to be related to the distress and first pain variables as well as the second tolerance measure and each of the magnitude ratings. Both private and public body consciousness were found to be related to each of the aforementioned variables to roughly the same degree. The body consciousness measures were furthermore related to more of the above measures than were the self-consciousness measures. Regarding the first pain and distress measures in particular, the correlation pattern suggests that private and public body consciousness as well as public self-consciousness are associated with these retrospective measures, while private self-consciousness is unrelated to these same measures. The high correlation found between the public body and public self-consciousness scales supports prior research that these variables are measuring approximately the same personality trait (Miller, Murphy, & Buss, 1981). Thus it appears that body consciousness measures are overall better predictors of both the in vivo and retrospective pain ratings than self-consciousness measures. However, they proved to be no better predictors of water coldness or cognitive focus ratings than the two self-consciousness measures. In drawing these conclusions, a caveat regarding the body consciousness measures must be considered. These

scales were administered directly following the other post-experimental measures and thus may have been influenced by both these measures and the experimental manipulations. The main argument against this possibility is that public self-consciousness is highly correlated with public body consciousness and is also related to two post-experimental measures, and to a lesser degree to three of the magnitude ratings. However, before body consciousness is considered to be a predictor of pain ratings, research gathering body consciousness data prior to an experimental procedure should be conducted. Furthermore the highest shared variance in the present study between the body consciousness scales and the response measures is only 19%, thus indicating only a modest relationship among these variables.

#### Visual Focus Measures

The visual measure analysis proved interesting in two respects. First, it suggests that the level of compliance regarding instructions to maintain visual focus on a particular target varied across conditions. Subjects tended to focus on the camera and spot for a greater proportion of the time than they did on the mirror. The reasons for this are unclear in the present research. A possible explanation may be generated from the self-consciousness literature, which postulates that attending to one's own mirror reflection in an aversive situation should further increase the negativity of the experience and thus would likely lead to an avoidance of further increases in private

self-awareness. However, since no other behavioral measure suggested an increased aversiveness as a result of mirror exposure, little supporting evidence exists for this hypothesis. An alternate explanation for lower focus in the mirror condition is that focusing on a spot or camera lens is easier and thus entails less variability in focal patterns. The spot and lens are both static and occupy a relatively small area of the visual field while the facial reflection is considerably larger, more complex and dynamic.

A related issue which may appear germane to explaining the aforementioned findings is the possibly different degrees of difficulty associated with rating visual focus over conditions. Because of the possibly more demanding focusing task in the mirror condition, it was speculated that accurately rating the degree of visual focus may also be more difficult in this condition. However an examination of the interrater reliability over conditions indicates no significant differences, thus suggesting no statistically evident problems in agreement between experimental judges.

To clearly establish the reason for reduced visual focus in the mirror condition, further research must be able to distinguish between the aforementioned alternate explanations. A possible methodology which could be used to investigate this problem would be to present a picture to the subject of his/her face in an area of comparable dimensions to the other visual targets presented. However, prior to this kind of manipulation, it must first be established whether a photograph of the face leads to similar self-focus effects to that of a small mirror.

The other findings of interest concerning the visual analysis data are the significant correlations between visual focus time and the magnitude and first-pain measures in the camera condition. Although each of the three visual focus measures in the camera condition shows a negative relation to the magnitude and first-pain measures, the third measure (i.e., after the 30 seconds immersion period) is the only one to reach statistical significance. This finding suggests that as more pain is reported, both in vivo and retrospectively, the proportion of time spent focusing on the camera decreases. It may be that subjects find it more negative to look directly at a monitoring device as pain increases. On the other hand, it may be that as subjects focus on the camera more, they become more publicly self-aware and experience (or report) less pain. As already discussed however, no other findings suggest that increased public self-awareness leads to a lower magnitude of pain reporting. The present data suggest, on the contrary, that higher levels of public self-focus (at least at the dispositional level) are associated with the reporting of increased pain. Since these alternate possibilities are based on correlational analyses, the question of causal direction remains speculative.

The remaining findings which reached statistical significance included the relationships between visual measures and the two retrospective measures of coldness magnitude ratings and degree of focus on the experimental instructions. Neither of these findings suggest clear meanings with regard to the questions addressed by the present research. Concerning the negative correlations between the

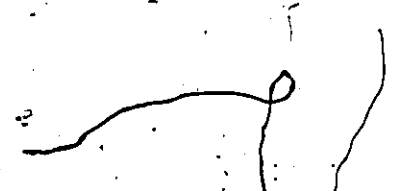
degree of instructional focus and visual contact with the stimulus, self-consciousness theory offers no suggestions as to why this may have occurred. However it may be speculated that when subjects maintain a high degree of visual focus on the spot they tend to spend less time focusing on the instructions relative to the mirror and camera conditions as a consequence of an attentional "anchoring" effect in the spot manipulation. That is, for those subjects who focus most on the spot for one reason or another, the instructional requirements are perhaps more clear than for the mirror and camera subjects who may have more questions regarding how they should be behaving, as a result of the higher possible discomfort experienced in these self-awareness conditions.

The inverse relationship found between retrospective coldness magnitude ratings and visual focus in the mirror condition is not consistent with what self-consciousness theory would predict. According to theoretical formulations, it logically follows that as subjects make more visual contact with their mirror reflections, they should experience a higher magnitude of coldness. However, considering that no differences in coldness ratings were noted between groups and that none of the in vivo measures were affected by mirror exposure, the correlational results in this situation are a weak basis for drawing evaluative conclusions regarding self-consciousness theory.

### Methodological Issues

Regarding methodological strengths and weaknesses of the present study, a number of important issues deserve attention. A primary consideration in examining pain in relation to self-consciousness and self-awareness was the choice of a stimulus which fulfilled three primary requirements. The cold pressor (CP) test was chosen since it logically fulfilled the necessity of minimizing the likelihood of increasing public self-awareness. The CP test, in contrast to other methods usually employed to induce pain, affords the possibility of isolating the subject in a manner which neither requires the experimenter in the same room nor implies control of the degree and onset of pain by the experimenter. The use of electrical, thermal, pressure and ischemic induction techniques have typically involved the experimenter being in the same room as the subject. Although these pain induction methods could be used remotely with the experimenter and subject occupying separate rooms, an implication of control and scrutiny by the experimenter would perhaps still be present, thus introducing a public self-awareness induction in all conditions.

A second strength of the CP test in the present research is the relatively non-threatening nature of this technique (Leventhal, Brown, Shacham, & Engquist, 1979). Each of the other techniques employed would generally be more apt to be considered as dangerous and thus highly anxiety provoking, even during the anticipatory period. The explicit induction of anxiety was avoided in the present research for two



reasons. First, it is unclear how self-focus at either the state or trait level interacts with an anxiety producing stimulus which cannot be avoided. It was surmised during the design of the research that building anxiety into the experimental procedure may have potentiated the level of private self-awareness to a high degree, thus possibly precluding further increases as a result of treatment manipulations. Furthermore, the intention in this research was to investigate pain rather than pain highly influenced by anxiety. It was observed however that this non-threatening nature of the CP test was not true for all members of the population sample. Several subjects expressed considerable fear of the CP procedure and were thus excluded from the study. It is interesting to note that these particularly fearful subjects had just recently arrived from tropical countries and had never up to that time experienced freezing temperatures.

The third reason for utilizing the CP methodology is the presumably slow onset of distress, thus providing sufficient time for cognitive manipulations to have an impact on the experienced pain (Wolf, & Hardy, 1943; Leventhal, Brown, Shacham, & Engquist, 1979). While some researchers have pointed out that CP pain peaks at about 60 seconds and then moves in cyclical increments and decrements at various time intervals (Stam et al., 1981), the present study found considerable differences in the point in time at which subjects reported the highest pain levels as evidenced by the high variances in reported magnitudes and particularly in the tolerance duration times. Although magnitude levels were not measured subsequent to the first 30 seconds of hand

immersion, it was noted that at the 30 second rating point, the subjects' mean magnitude value was 75% of the scale ~~distance~~ to the point judged as representing excruciating pain. In addition to this relatively fast onset of pain, many subjects offered unsolicited post-experimental reports which indicated that they felt that the CP procedure was characterized by a rapid onset of high pain levels. Considering the aforementioned findings it appears that the assumptions made by other investigators regarding the slow onset of CP induced pain may not be warranted. It is perhaps more accurate to say that for some subjects slow pain onset is a correct description of the CP situation, while for others this is clearly not the case. Thus it seems that an induction technique which could maintain the experimental isolation of the present situation as well as being nonthreatening and having a slow onset of pain magnitude would be an improvement over the present study.

A second methodological issue and innovation in the present research was the use of a procedure which increased the likelihood of the subject attending to the self-awareness induction stimulus as well as facilitating the experimental monitoring of the direction of the subject's gaze. It seems that the degree of contact subjects make with the target stimulus would be relevant to the assumption that a self-awareness inducing stimulus is in fact leading to greater self-awareness. In connection with this last point, the induction of self-awareness through the visual channel presents a different kind of methodological consideration than would arise with the auditory channel. Visual contact with a stimulus can generally be avoided by either

closing the eyes or turning the body in a direction away from the stimulus. Auditory stimulation on the other hand cannot be completely avoided by moving the body in relation to the sound source. Thus both the assumption that contact with the visual stimulus is associated with self-awareness induction and the potential for a high variability of focus on the stimulus, led to the use of the bogus electrode visual stabilizing procedure. The rationale for concern with maintaining the salience of the visual stimulus was discussed in a study by Scheier, Fenigstein, and Buss (1974) in which it was demonstrated that audience presence heightened self-focus only when the audience was made salient by frequent eye contact with the subject. It was furthermore noted in a pilot study of the present research that when the dummy electrode procedure was not used, a high variability of visual focus on the target stimulus resulted as well as concomitant difficulties in accurate experimental monitoring of the subjects' time-on-target.

A question which arises in connection with use of the bogus electrode is the possible relationship between the electrode and private self-awareness. It may seem that the use of such a monitoring device would increase the subjects' awareness of internal events, and thus result in a greater degree of private self-awareness. If this type of procedure is associated with increased private self-awareness it would have affected all treatment groups in this study and thus may have precluded further increases in private self-awareness as a result of mirror exposure. A research project by Fenigstein and Carver (1978) found that a heart rate recording device did not in fact lead to greater

self-awareness. Once again the important factor seems to have been the salience of the technology. In Fenigstein and Carver's study the subject could probably have easily lost awareness of the recording device since it was strapped to the chest and thus not clearly visible. In the present study the recording device was attached to the back of the neck and was thus also not within the subjects' visual field. In contrast to Fenigstein and Carver's research, the present study instructed the subject to maintain visual focus on the presented target as a means of stabilizing the head to facilitate the recording of electrode signals. This latter procedure may have led to a more consistent awareness of the electrode monitoring system, with a concomitant increase in private self-awareness. An argument against this possibility is that almost every subject had to be reminded to remain seated at the end of the session till the experimenter removed the electrode. This latter observation suggests that subjects had lost awareness of the recording device. However, it should also be noted that the aforementioned study by Fenigstein and Carver (1978) is the only research which has directly addressed this issue, thus warranting caution before making a definitive statement regarding the relationship between physiological monitoring devices and self-awareness.

The last methodological issue of importance for this discussion is the relationship between the in vivo dependent measures and the retrospective measures. The highest degree of association regarding these variables was between both the distress and first pain scores and the magnitude measures. This suggests that the in vivo pain magnitude

measures are reflected more by the retrospective negative affect measure (distress) and the retrospective pain magnitude measure (first-pain) than they are by the stimulus temperature measures (cold-rating and cold-focus). These findings are logically consistent in that the pain magnitude in vivo and retrospective measures as well as the distress measures all include an affective component whereas the cold-rating and cold-focus variables are more directly related to stimulus qualities. It is difficult to extrapolate to other CP situations with regard to the generalizability of these findings since no other studies have included both stimulus quality, pain magnitude and distress measures.

A number of studies have included "discomfort" scales in conjunction with tolerance measures (e.g., Avia & Kanfer, 1980; Beers & Karoly, 1979). Discomfort ratings probably include a negative affect component, although to a somewhat lesser degree than do distress measures. The two aforementioned studies did not report a correlational analysis of these variables, but did note that at most, only partial support was found for similar effects between treatments with regard to these dependent measures. A study by Scott and Barber (1977) employed tolerance, pain magnitude and distress ratings. Only the tolerance measure showed differences between groups, once again suggesting that each of these ratings is measuring a different aspect of the CP experience.

In the present study the tolerance measure is moderately related to both the retrospective affective measures (distress and first-pain) and the stimulus quality measures (cold-rating and cold-focus), sharing a

maximum of 21% of the variance. These findings in conjunction with the aforementioned magnitude results may suggest that while tolerance duration is somewhat reflected by affective and stimulus quality measures, the in vivo magnitude ratings are more strongly related to the former measures (first-pain and distress). However, in proposing these suggestions it must be noted that no consistent treatment effect was found between these post-experimental measures and the magnitude and tolerance measures. Furthermore, the highest proportion of the variance shared by these post-experimental variables and the dependent measures (i.e., between magnitude and first-pain) was 44%. Both of the above considerations suggest that although the first-pain and distress measures provided a relatively good reflection of the in vivo magnitude ratings, not enough of the variance was accounted for to confidently employ either the in vivo or retrospective measures alone to investigate pain.

Before concluding this discussion on the measurement of pain, another factor may prove relevant in accounting for a certain proportion of the differences between the in vivo and retrospective pain measures in this and future research. In the two self-awareness conditions of the present research the in vivo measures were taken in front of a self-awareness inducer while the retrospective measures in the same conditions did not receive this treatment. The two non self-awareness conditions on the other hand, obtained the in vivo and retrospective measures under similar situations (i.e., non self-awareness). Thus from a self awareness perspective the self-awareness and non self-awareness

conditions are not strictly analogous with respect to the in vivo and retrospective measures. A previously discussed study which addressed this issue found that self-reports completed in front of a mirror led to a higher correlation between actual behavior (sociability) and the subjects' self-relevant judgments regarding this behavior than was found in the absence of the mirror (Pryor et al., 1977).

In the present study, three out of four of the recently discussed retrospective measures showed no differences in correlational strength to the in vivo dependent measures with respect to self-awareness and non-self-awareness groups. The one retrospective measure which did yield a difference in this regard was the cold-rating variable. This measure was found to share from 0-7% of the variance with the second tolerance measure in the self-awareness conditions (mirror and camera) while sharing 40-46% of the variance with this tolerance measure in the non-self-awareness treatments (spot and control). Whether or not these differences are a result of the higher consistency with regard to in vivo and post-experimental self-awareness conditions (in this case the lack of self-awareness inducers) is unclear from the present data.

However this latter finding, in addition to the absence of self-awareness/non-self-awareness differences in the correlations between the other three retrospective and the in vivo measures, raises the question of how these relationships may have been different if the degree of self-awareness had been consistent from in vivo to

vivo and post experimental measures would be associated with not only an intensification of pain but also with an increased knowledge (in this case, memory) of how one behaved as reflected in the post-experimental ratings. On the other hand, exposing subjects to a camera (public self-awareness) during the in vivo and post-experimental periods would presumably have had the effect of pain reduction (in the service of a "tough" public image) and would not be likely to lead to increases in the correlation between the in vivo and post-experimental measures, since public self-awareness is not associated with a higher degree of self-knowledge. To clarify this issue, it would be necessary for future research to vary the degree of private and public self-awareness in both the in vivo and post-experimental measures.

#### Theoretical Issues

Several theoretical issues seem pertinent to the present research and the study of pain in relation to self-awareness in general. The results of this study suggest that personality factors in conjunction with strategy use affects the experience of pain to some degree. A major hypothesis of the present research was that the personality trait of private self-consciousness would affect the evaluation of pain. Since the private self-consciousness dimension only yielded results approaching statistical significance with regard to the dependent measures (tolerance duration), it may be fruitful to examine the relationships of other personality traits to pain reactions. Lynn and

Eysenck (1961) suggested that extraverts have higher pain tolerance than introverts since they are typically less anxious and thus experience less pain. They furthermore found a negative correlation between pain tolerance and neuroticism. Petrie (1967) supported Lynn and Eysenck regarding extraversion but argued that neither anxiety nor neuroticism were correlated with pain tolerance. Davidson and McDougal (1969) failed to find statistically significant relationships between the two measures of neuroticism and extraversion and three different kinds of pain (i.e., pressure, electric shock and cold-pressor). Brown, Fader, and Barber (1973) also showed no significant correlations between neuroticism, extraversion, anxiety and pain tolerance. Elton, Vagg, and Stanley (1978) on the other hand found a moderate correlation between trait anxiety and pain tolerance and adduced this as support for Lynn and Eysenck's aforementioned contention regarding pain tolerance and neuroticism. Thus with the exception of this last study, which somewhat questionably extrapolated from trait anxiety to neuroticism, the available research (including the present study) provides no convincing evidence that Eysenck's personality dimensions are related to pain parameters.

Another personality dimension which has been investigated in relation to pain is "augmentation-reduction". Petrie (1967) classified those individuals who are less affected by prior perceptions as augmenters in contrast to the somewhat more affected reducers. Petrie has argued that augmenters will show an exaggerated reaction to pain, in contrast to the more inhibited response pattern of reducers. The above

mentioned study by Elton et al (1978) however, found no empirical support for Petrie's position.

A third classification scheme by Byrne (1961) dichotomized individuals into "repressors" and "sensitizers". Repressors typically are said to deal with threat by denial, avoidance and repression, while sensitizers presumably react with approaching and intellectualizing behavior. Two studies have found that repressors show a reduction in pain tolerance on a second exposure to the pain stimulus, while sensitizers displayed no change from the first to second exposure (Bobey & Davidson, 1970; Neufeld & Davidson, 1971).

Lukin and Ray (1982) investigated cold-pressor pain in relation to a variety of personality characteristics (e.g., self-esteem, depression, self-confidence, self-control, personal adjustment, achievement, dominance and endurance). The results showed no significant relationships between these personality traits and pain tolerance. As was stated earlier however, pain tolerance was significantly influenced in that particular study by cognitive factors (i.e., focus on the hand and/or ice water in contrast to cognitive distraction).

An examination of both the literature on personality factors and the literature on cognitive strategies in relation to pain indicates that the latter area of investigation has yielded the vast majority of significant results, while the former category of exploration includes few unequivocal findings. The present study is relevant to the above situation in that although no clearly significant results on the self-consciousness dimensions or strategy use in relation to the primary

dependent measures were obtained, private self-consciousness did show a moderate relationship to tolerance scores when strategy use was considered. It may thus be fruitful to speculate on the possible relationship between strategy use and private self-consciousness with regard to pain measures.

As previously stated, the highest reported use of strategy was in the high private self-consciousness subjects who were exposed to self-awareness manipulations (i.e., the mirror and camera conditions). With regard to the tolerance score results in relation to strategy use however, only the private self-consciousness dimension proved significant. The reason for this apparent discrepancy is unclear from the present data. It may be that although the self-awareness manipulations are associated with strategy use for high private self-consciousness subjects, the tolerance duration effectiveness of strategy use is most strongly related to the personality trait (i.e., private self-consciousness) rather than the self-awareness treatments.

A number of issues and possible directions for future research arise from the aforementioned strategy by private self-consciousness interaction. The present research is one of the few studies to investigate strategy use in relation to a personality trait. Since the employment of a strategy did not fall within the purview of the questions posed by this research, the post-experimental questionnaire was not designed to investigate strategy utilization in more than a cursory fashion. The types of strategies reported by subjects were also not amenable to a manageable classification scheme, thus precluding a

qualitative analysis of strategy categories. However, the reported use of a strategy by over two thirds of the subjects does corroborate evidence that even when not presented with coping strategies by the experimenter, subjects tended to use their own techniques for controlling pain (Barber & Cooper, 1972). Thus in future research it may prove fruitful to explore the types of coping strategies used by subjects. In addition to the qualitative aspects of strategy use, future studies could also obtain a subjective assessment from subjects regarding the percentage of time they utilized particular strategies. Self-consciousness theory argues that high private self-consciousness individuals have a higher degree of self-knowledge than those low on the dimension. If high private self-consciousness subjects know themselves better with regard to coping, the strategy content and time percentage use may yield different patterns than those found for low private self-consciousness individuals. High private self-consciousness people may for example tend to use strategies a greater percentage of the time if they are more competent in this regard and are thus reinforced for increased strategy use by pain reduction.

Another possible research direction regarding strategy utilization in relation to private self-consciousness is to employ the coping-catastrophizing dimension (Spanos, Radtke-Bodorik, Ferguson, & Jones, 1979). Several studies have found that the spontaneous use of coping strategies was associated with relatively low pain reports, while those subjects who tended to engage in catastrophizing ideation reported relatively high pain levels (Chaves & Barber, 1974; Spanos et al., 1979;

Spanos & Brown et al., 1981; Spanos, Stam, & Brazil, 1981). Thus it would be interesting, in addition to exploring strategy use in relation to the private self-consciousness dimension, to find out what the non-copers are doing during a pain induction. It seems to follow from self-consciousness theory that high and low private self-consciousness individuals who catastrophized would show different levels of pain reporting. High private self-consciousness subjects would most likely experience greater pain than low scorers since the former group is theoretically more adept at internal scanning and thus may selectively gather further evidence of the aversiveness of the pain. The only one of the aforementioned questions which has been partially addressed in the literature is the coping capabilities of individuals at different levels of private self-consciousness. A study by Mullen and Sulls (1982) found that high relative to low private self-consciousness subjects are less susceptible to illness following undesirable uncontrollable life events. The authors proposed that these findings result from a greater awareness on the part of high private self-consciousness individuals of their psychological and somatic reactions to stressful events and a subsequent employment of instrumental behaviors to attenuate these reactions. Thus it appears, that at least in this situation high private self-consciousness subjects tended to use coping strategies more and/or are more effective in using strategies. This research by Mullen and Sulls has limited explicative value with regard to the frequency of strategy use and strategy utilization efficacy, since it was not designed to permit an independent assessment of each of these factors.

Furthermore, these researchers were investigating coping over a much longer time period (3 weeks) than would be employed in the experimental induction of pain.

Further evidence for a connection between pain reduction and self-directed attention was a positive correlation found between self-directed awareness and the amelioration of chronic pain (French & Tupin, 1973). Another study found that the avoidance of pain and injuries by elite marathon runners was associated with a careful self-monitoring (Morgan & Pollock, 1977). The latter two studies are correlational in nature and thus do not permit the drawing of clear conclusions with regard to the questions of strategy use frequency and efficacy.

Another important issue with respect to studying strategy use is the assumption that baseline pain measures reflect an accurate pre-treatment pain response. A recent study by Spanos, Hodgins, Stam, and Gwynn (1984) throws this assumption into question by finding that subjects often did not use available coping strategies in a laboratory pain situation unless given explicit permission to do so. Furthermore, these authors found that giving subjects permission to do whatever they could to reduce pain was as effective as giving them coping suggestions for pain reduction. It is difficult to predict what the outcome of the present research would have been if subjects had been given permission to reduce the pain by generating their own coping strategies. If high private self-consciousness subjects do use strategies more and with a higher degree of efficacy because they know themselves better, giving

them permission to cope may increase strategy use to a greater extent than would be the case for the low private self-consciousness people. That is, giving low private self-consciousness individuals permission to cope may have less effect (i.e., relative to the "highs") on strategy use since they are less in the habit of engaging in such internal manipulations.

An issue of major importance in reaching an understanding of the relationship between pain and attentional processes is the types of objects of attentional focus which influence the experience of pain. A perusal of the literature concerning pain in relation to various kinds of coping strategies quickly dissuades one from concluding the comparative efficacy of one pain reduction strategy over another. With regard to an explicit focus on certain self-aspects such as sensory, affective or cognitive events in relation to pain, only a limited amount of research is available. Prior to the present research, no studies on pain have been conducted in such a fashion that self-aspects have been made salient indirectly through situational manipulations (i.e., the mirror and camera exposure).

In the present study, it was assumed that a specific manipulation and personality trait (i.e., mirror exposure and high private self-consciousness respectively) would lead to an increased focus on the most salient self-aspects, which in this case would theoretically have consisted of the components of pain. As already discussed, the mirror exposure and high private self-consciousness were weakly associated with a greater degree of reported self-focus but with no increases in the

rated magnitude of experienced pain. It may be that self-focus was not amplified enough to have resulted in an increase in pain. Another possibility, as discussed earlier, is that the pain levels were too high to be further increased as a consequence of self-focus. A third possibility is that there is no necessary connection between self-focus and pain. Although these questions cannot be answered by the present study, some suggestions for future investigations may follow from a review of some of the literature dealing with pain and attentional focus.

The studies which have investigated pain in relation to a focus on targets, which from the perspective of self-consciousness theory would qualify as self-aspects, provide no simple or clear answers with regard to the previously addressed questions. Generally the self-aspects explored in these studies were comprised mainly of attention directed to affective reactions or to localized sensations. Kanfer and Goldfoot (1966) found that subjects attending to and reporting the sensations experienced during cold-pressor hand immersion had a lower tolerance duration than both a distraction group and a negative set induction group, consisting of an expectation of severe pain. Pennebaker, Skelton, Wogalter and Rodgers (Note 1) found lower pain thresholds for subjects attending to the sensations in their hand than for those using a distraction strategy (thinking about a nearby building). A study by Lukin and Ray (1982) lend further support to the pain amplification argument by showing that subjects using cognitive distraction tolerated the cold-pressor pain longer than those subjects who thought about their

hand or the ice water. Two studies by Craig, Best, and Best (1978) and Klemm and Rodin (1976) found reduced tolerance and increased distress ratings respectively for subjects attending to sensory aspects of electric shock relative to those subjects attending to the experienced negative affect. An experiment by Blitz and Dinnerstein (1971) showed an increased pain threshold but not an increased tolerance duration for subjects focusing on water coldness relative to control subjects.

All of the above-mentioned research, with the exception of the study by Blitz and Dinnerstein (1971), found explicit or implicit increases in distress as a result of focusing on sensory aspects of pain. Blitz and Dinnerstein's study did however differ from the others in that subjects focused on water coldness (i.e., a stimulus quality) rather than bodily sensations, and thus perhaps reduced the self-relevant aspect of pain (i.e., suffering). Since the studies discussed used different designs and are thus not strictly comparable, a caveat is proposed regarding the conclusion that a focus on the sensory aspects of pain is associated with an exacerbation of negative affect.

A second important consideration in evaluating the import of these studies is the issue of induction set. The aforementioned studies, with the exception of Kanfer and Goldfoot (1966), used the word "pain" in the experimental instructions or perhaps implied pain by the nature of the manipulation (e.g., electric shock). This "loading" of the experimental set in a negative direction may have been responsible for the increased distress rather than the result of monitoring physical sensations. Several studies have addressed and given credence to the negative set

hypothesis. Leventhal et al. (1979) found that subjects instructed to attend to their sensations during the cold-pressor reported less distress than uninformed subjects. However, when the word "pain" was mentioned in the instructions, the focus-on-sensations strategy proved ineffective. The authors proposed that this reduction in strategy efficacy may have occurred as a result of the activation of a distress schema by the pain expectation.

McCaul (1980) provided corroborating evidence for the set hypothesis by showing that sensory information potentiated distress for high fear subjects while reducing distress for low fear subjects. McCaul surmised that those individuals who have a high fear of pain tend to encode information concerning a painful stimulus in a distressing manner. Another experiment by McCaul (1980) found that distraction was a superior coping method to sensory attention during the early parts of the cold-pressor test but the reverse proved true for the latter part of the cold-pressor trial. In that particular study, the word "pain" was carefully avoided on the assumption that the use of this label may have prevented the formation of objective schema in those studies which showed an increase in distress with sensory focus (e.g., Pennebaker et al., Note 1).

With regard to the increased tolerance duration and the lowered distress ratings for subjects focusing on the affective reactions to electric shock, it appears that if a negative set was implicit in these studies (Craig, Best, & Best, 1978; Klomp & Rodin, 1976), it did not have the same effects as occurred with sensory focus. The reason for the

distress reduction in these latter two studies is unclear. It may be that by focusing on the affective reactions to pain, subjects were able to objectify and thus depersonalize it. However it is not apparent why focusing on sensory aspects of pain would, even if a negative pain set was present, not lead to the same objectifying effects with a consequent reduction in distress.

In the present study, the pain label was used both on the in vivo magnitude ratings and the post-experimental questionnaire. This "pain" set may have biased subjects towards rating pain magnitudes at levels high enough to preclude possible self-awareness treatment effects. Considering the relatively small body of empirical studies dealing with focused attention on different self-aspects in experimentally induced pain situations, no definitive explanatory statements can be made at this time. Furthermore, it will be important for future research to gain a greater understanding of the kinds of salient self-aspects focused on during a painful event. Self-consciousness theory argues that those personally internal events having an affective charge are intensified by private self-awareness and private self-consciousness. As already discussed, it thus follows from this theoretical perspective that pain will be magnified by private self-focus. Considering the aforementioned complexities of self-focus in relation to pain it may prove fruitful for further investigations to adopt a component analytic approach, as well as controlling for the effects of experimental induction set. That is, it may be of value to not only construe pain as consisting of sensory and affective components but to design research to discriminate which of

these components is affected by different kinds of self-focus at the state and trait levels. Such a project may include a combination of experimental conditions where subjects would be either instructed to focus on sensations or distress reactions and make in vivo and retrospective ratings on scales representing each of these dimensions. Furthermore, different types of induction sets could also be employed to assess the impact of this factor on particular types of self-focus.

#### An Alternative Paradigm

The self is a concept which has been the object of considerable controversy among philosophers and social scientists. It has been construed in various ways ranging from a conjectural hypothesis as found in Hume's thinking, to the transcendental subject of Kant (Brett, 1965). Carl Rogers seems to be on the Kantian side of the issue in the sense of having formulated a causal agent self as distinct from the whole person (Rogers, 1947). Duval and Wicklund (1972) postulated a bidirectional unified consciousness as the most salient quality of a single self. Gordon Allport (1965) on the other hand was unwilling to hypothesize an inner agent to the person which served as the central controlling function.

Rather than becoming enmeshed in an extended discussion of the self, which is beyond the scope of this work, the remainder of the present discussion will be descriptive in form and based on the author's own experiences and the accounts of those who have approached the study.

of the self from an Eastern psychological framework. This experiential approach will be taken as an end point to this treatise and as a beginning point to the consideration of the topic from an alternative viewpoint to the experimental one adopted in this research.

The introspective methodology of Buddhist Vipassana meditation, one of the more well known Eastern self-exploration disciplines, is introduced and briefly discussed as an alternative hermeneutic to self-consciousness theory in understanding pain in relation to self-awareness. Vipassana, which may be translated from the original Pali as "insight", generally proceeds through the practice of "mindfulness" (satipatthana). The insight sought after is the perception of what is considered to be a higher level of reality underlying the provisional reality of ordinary consciousness. The set of skills comprising mindfulness primarily involves the maintenance of attentional continuity with regard to internally and externally generated stimuli. As the practitioner becomes more adept with this attentional practice, the awareness threshold of many stimuli is reduced, having an effect opposite to that of perceptual vigilance. In other words, the differential between the perception of need-related and non-need-related stimuli is attenuated to a degree that has been referred to as "choiceless awareness" (Krishnamurti, 1973), whereby the selective filtering of ordinary perception is replaced by a less biased perceptual mode.

This attentional practice of Vipassana meditation may also be described as a de-automatization of basic perceptual habit patterns in

the direction of an increased receptivity to stimuli with a concomitant decrease in reactivity. This increase of the signal-to-noise ratio results in a higher degree of perceptual distinctiveness as well as an increased probability of detecting patterns of interrelationship within the matrix of phenomena. This alteration of attentional habits has often been equated with increased perceptual objectivity and has been considered to result from both a more detailed continuous examination of stimuli in conjunction with a decrease in involvement with stimuli, both at the emotional reactive and cognitive levels (Sayadaw, 1971). Another way to describe this process is a gradual replacement of the "internal dialogues" which imbricate mental life by an attentional set devoid of intrapsychic communications. With the attenuation of internal "noise", perceptions which have become habitual and thus have ceased to be carefully attended to, are experienced with increased interest. In the Zen Buddhist tradition, this perceptual dehabituation has been called a return to the "beginner's mind", a state in which the ordinary discursive judgemental process is suspended in favor of a more intuitive mental set.

In contrast to Vipassana, the intentional cultivation of particular skills is not required to enter the state of private self-awareness, nor is it generally considered to be an altered state of consciousness. Buss (1980) mistakenly assumes that private self-awareness and certain stages of Vipassana are identical (p. 18). With respect to the increased clarification and distinctiveness of internal events hypothesis, a limited parallel may be drawn between both perspectives. However, a

difference in the intensity of attentional processes between these two types of self-focus leads to qualitative differences in perception. Even during the preliminary stages of Vipassana training, the practitioner notices both an increase in the number of events perceived and a previously unrecognized figure-ground aspect to perception. The objects of perception in the quiet more concentrated Vipassana state seem to "stand-out" against a background of silence, or "emptiness", in a manner not experienced in ordinary private self-awareness.

Regarding the intensification of affectively charged internal events hypothesis in self-consciousness theory, the Vipassana perspective predicts results opposite from those of self-consciousness theory with respect to internal self-focus. That is, instead of an increased emotional reactivity as a consequence of self-focus (private self-awareness), the Vipassana experience engenders a reduction in the prepotency of cognitions and affects to a level where they no longer occupy a privileged status among mental phenomena. This latter process may result from an increased temporal distance between perceptual events, which seems to interrupt the feedback loops usually found in cognitive-affective interactions. In the case of pain, the affective and cognitive factors are registered separately from the sensory reaction to the pain stimulus. Each of these component factors of pain appears to arise and pass away within consciousness, and to be momentarily replaced by any other salient event. The process by which the intensification of pain presumably occurs according to self-consciousness theory is precluded by the continuity of attention on changing perceptions rather

than becoming involved with the construction of negatively valenced evaluations of the pain.

Beyond proposing that intensification and clarification of affectively charged internal events takes place by focused attention on private self-aspects, self-consciousness theory does not discuss psychological or situational parameters which would elucidate these processes. Buss (1980) presents the situation of increased aversiveness resulting from a direct focus on a bright light compared to an oblique glance, as an example of how private self-awareness operates. The introspective clarity of attention facilitated by the Vipassana experience suggests that this example oversimplifies a necessarily complex process. With regard to pain, whether it increases or decreases with a higher degree of focus directed towards it depends on a multitude of interactions involving cognitive, affective, perceptual and sensory factors. It is furthermore unclear what the meaning of an increased focus on pain may be from a self-consciousness theoretical perspective. Vipassana introspection suggests that even within the same subject, different situations or moods may be associated with a focus on the different components of pain (i.e., sensory, cognitive, affective). Finally it may be noted by the self-observing subject that focal stabilization on any one constituent of pain (i.e., self-aspect) has a short temporal duration regardless of its saliency.

The consequences of these different types of self-awareness for pain may be further clarified by the use of a metaphor from the physical world. The metaphor of "space" aptly suggests differences in the

dimensions of the experienced self in the two kinds of self-awareness being discussed. In ordinary private self-awareness, the experience of pain is often felt as an inundation of self with a consequent diminution of self. Self-awareness in this case is primarily truncated to the components of pain, which tend to appropriate other self-aspects which reach awareness to their negative affective valence.

Vipassana self-awareness on the other hand, is often experienced as an expansion of the self to include objects previously considered to be external. This state, often described as a "panoramic" awareness, not only affects the permeability of the self's boundaries, but at certain levels of attentional quality deconstructs the entity status of perception, thus homogenizing reality. This re-punctuation of the perceived world is necessarily associated with a mutation of the hermeneutic framework regarding the self, and consequently of pain itself. The self from this perspective (which is in fact no perspective), is reinterpreted (by the now realized illusory interpreter) as non-existent in the ordinary sense, in that both the personal self and the environment have so completely interpenetrated that neither have retained meaning value within the limits of linguistic convention. In this framework (non-framework) pain is experienced not as an event (discrete), but as a process (continuous) of an impersonal nature. At this state of "unitive" consciousness, pain is no longer seen as a conflictual force which must be controlled, an attitude which seems endemic to ordinary private self-awareness. Pain is now experienced no longer as pain, since the experiencer and thus the controller have

vacated their ontological roles. In the language of information processing the superordinate position of the digital (entities, events, analytic, verbal, individual) over the analog (relationships, processes, synthetic, pre-verbal, interactive) has been reversed. The opposition of the self and environment into specific space and time coordinates (digital) has been resolved into a relationship of interpenetration and simultaneity (analog).

In summary, the aforementioned discussion of private self-awareness and Vipassana self-awareness illustrates the dangers of oversimplifying the complexities of the subjective experience of pain. Furthermore, it seems clear that attentional parameters must be considered in predicting the effects of self-directed attention on pain. Considering the inchoate nature of our understanding of both experimentally induced and clinical pain, a variety of epistemological approaches seems appropriate. Regarding the investigation of self-awareness, it may be time to explore concepts other than the mirror metaphor to simultaneously capture the subject and object facets of the self. Although the mirror metaphor concisely illustrates the quality of reflexiveness in the concept of self-awareness, it engenders mysterious consequences regarding the location of the subject, as expressed in a comment by Hilgard (1949): "(The) self-evident character of self-awareness is in fact most illusive. You presently find yourself as between the two mirrors of a barbershop, so that as the self takes a look at itself taking a look at itself, it soon gets all confused as to the self that is doing the looking and the self which is being looked at. (p. 377)."

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APPENDIX 1

Self-Consciousness Scale

Name \_\_\_\_\_ Sex \_\_\_\_\_

Phone# \_\_\_\_\_

Please respond to each of the following statements by circling the appropriate number from 0 to 4, where 0 means that the statement is extremely uncharacteristic of you, and 4 means that the statement is extremely characteristic of you. The other numbers represent choices between these two extremes.

	<u>extremely uncharacteristic</u>				<u>extremely characteristic</u>
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

	<u>extremely uncharacteristic</u>			<u>extremely characteristic</u>	
5. I'm constantly examining my motives.	0	1	2	3	4
6. I feel anxious when I speak in front of a group.	0	1	2	3	4
7. One of the last things I do before I leave my house is look in the mirror.	0	1	2	3	4
8. I sometimes have the feeling that I'm off somewhere watching myself.	0	1	2	3	4
9. I'm concerned about what other people think of me.	0	1	2	3	4
0. I'm alert to changes in my mood.	0	1	2	3	4
1. I'm usually aware of my appearance.	0	1	2	3	4
2. I'm aware of the way my mind works when I work through a problem.	0	1	2	3	4
3. Large groups make me nervous.	0	1	2	3	4

APPENDIX 2

Factor Loadings of the Self-Consciousness Scales

2

## ITEMS AND FACTOR LOADING OF THE SELF-CONSCIOUSNESS SCALE

A priori scale assignment	Factor loading <sup>a</sup>		
	Private self-consciousness	Public self-consciousness	Social anxiety
Private self-consciousness			
I'm always trying to figure myself out. (1)	.65		
Generally, I'm not very aware of myself. (3) <sup>b</sup>	-.48		
I reflect about myself a lot. (5)	.73		
I'm often the subject of my own fantasies. (7)	.45		
I never scrutinize myself. (9) <sup>b</sup>	-.51		
I'm generally attentive to my inner feelings. (13)	.66		
I'm constantly examining my motives. (15)	.62		
I sometimes have the feeling that I'm off somewhere watching myself. (18)	.43		
I'm alert to changes in my mood. (20)	.55		
I'm aware of the way my mind works when I work through a problem. (22)	.46		
Public self-consciousness			
I'm concerned about my style of doing things. (2)		.47	
I'm concerned about the way I present myself. (6)		.65	
I'm self-conscious about the way I look. (11)		.61	
I usually worry about making a good impression. (14)		.72	
One of the last things I do before I leave my house is look in the mirror. (17)		.51	
I'm concerned about what other people think of me. (19)		.73	
I'm usually aware of my appearance. (21)		.60	
Social anxiety			
It takes me time to overcome my shyness in new situations. (4)			.76
I have trouble working when someone is watching me. (8)		.26	.45
I get embarrassed very easily. (10)			.70
I don't find it hard to talk to strangers. (12) <sup>b</sup>			-.66
I feel anxious when I speak in front of a group. (16)	.21		.46
Large groups make me nervous. (23)			.69

Note. The numbers in parentheses indicate the sequence of items on the scale

<sup>a</sup> Only factor loadings greater than .20 are listed.

<sup>b</sup> Item was reversed for scoring.

APPENDIX 3

Normative Data for the Self-Consciousness Scale

MEANS AND STANDARD DEVIATIONS FOR  
COLLEGE MEN AND WOMEN

---

Variable	Men <sup>a</sup>		Women <sup>b</sup>	
	M	SD	M	SD
Private self-consciousness	25.9	5.0	26.6	5.1
Public self-consciousness	18.9	4.0	19.3	4.0
Social anxiety	12.5	4.1	12.8	4.5
Total self-consciousness	57.3	9.2	58.7	8.9

---

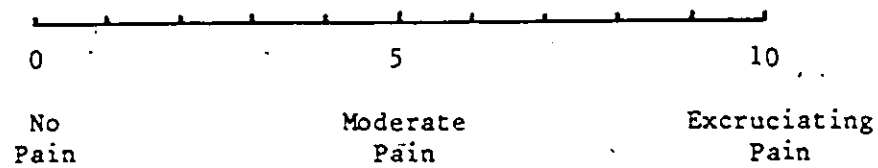
<sup>a</sup><sub>n</sub> = 179.

<sup>b</sup><sub>n</sub> = 253.

APPENDIX 4

Pain Magnitude Rating

Rate the degree of pain  
that you are feeling now:

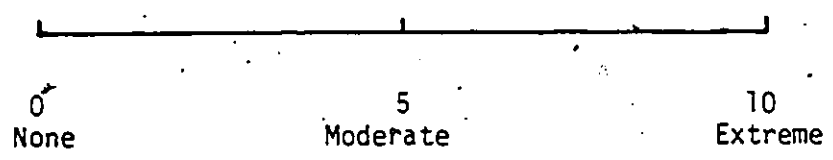


APPENDIX 5

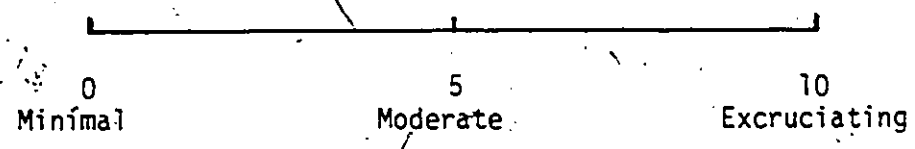
Post-Experimental Questionnaire

THE FOLLOWING QUESTIONS ARE CONCERNED ONLY WITH THE SECOND TIME THAT YOUR HAND WAS IN THE WATER:

Rate the overall degree of distress that you experienced while your hand was in the water for the second time:



At the point when pain was first felt while your hand was in the water, it was:

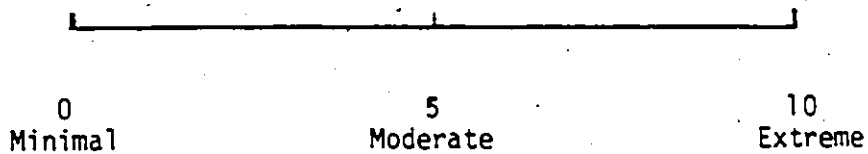


While your hand was in the water for the second time, what percentage of the time were you thinking about each of the following:

Yourself	-	0	10	20	30	40	50	60	70	80	90	100
Instructions-		0	10	20	30	40	50	60	70	80	90	100
Coldness	-	0	10	20	30	40	50	60	70	80	90	100
Other things-		0	10	20	30	40	50	60	70	80	90	100
<b>TOTAL</b>		<b>100%</b>										

Make sure that the percentages which you have circled add up to equal the sum of 100%.

Rate the degree of coldness that you felt while your hand was in the water for the second time:



While your hand was in the water for the second time, did you use some kind of strategy to reduce the pain?

YES \_\_\_\_\_

NO \_\_\_\_\_

If you answered "YES", what kind of strategy (or strategies) did you use to reduce the pain?

Four horizontal lines for writing an answer. A handwritten scribble is present on the top line.

Would you be willing to come back and further participate in this kind of project?

Very Interested - \_\_\_\_\_

Only if you are really stuck for help - \_\_\_\_\_

Not Interested - \_\_\_\_\_

APPENDIX 6

Body-Consciousness Questionnaire

Please respond to each of the following statements by circling the appropriate number from 0 to 4, where 0 means that the statement is extremely uncharacteristic of you, and 4 means that the statement is extremely characteristic of you. The other numbers represent choices between these two extremes.

	extremely uncharacteristic			extremely characteristic	
	0	1	2	3	4
1. I am sensitive to my internal bodily sensations.	0	1	2	3	4
2. When with others, I want my hands to be clean and look nice.	0	1	2	3	4
3. For my size, I'm pretty strong.	0	1	2	3	4
4. I know immediately when my mouth or throat gets dry.	0	1	2	3	4
5. It's important for me that my skin looks nice...for example, has no blemishes.	0	1	2	3	4
6. I'm better coordinated than most people.	0	1	2	3	4
7. I can often feel my heart beating.	0	1	2	3	4
8. I'm very aware of my best and worst facial features..	0	1	2	3	4
9. I'm light on my feet compared to most people.	0	1	2	3	4
10. I am quick to sense the hunger contractions of my stomach.	0	1	2	3	4
11. I like to make sure that my hair looks right.	0	1	2	3	4
12. I'm capable of moving quickly.	0	1	2	3	4
13. I think a lot about my body build.	0	1	2	3	4
14. I'm very aware of changes in my body temperature.	0	1	2	3	4
15. I'm concerned about my posture.	0	1	2	3	4

APPENDIX 7

Factor Loading of the Body Consciousness Questionnaire Scale

Items and Factor Loadings of the  
Body Consciousness Questionnaire Scales

Scale/item	Factor loading
<b>Private Body Consciousness</b>	
I am sensitive to internal bodily tensions	.45
I know immediately when my mouth or throat gets dry	.50
I can often feel my heart beating	.54
I am quick to sense the hunger contractions of my stomach	.39
I'm very aware of changes in my body temperature	.39
<b>Public Body Consciousness</b>	
When with others, I want my hands to be clean and look nice	.53
It's important for me that my skin looks nice ... for example, has no blemishes	.68
I am very aware of my best and worst facial features	.48
I like to make sure that my hair looks right	.68
I think a lot about my body build	.44
I'm concerned about my posture	.15
<b>Body Competence</b>	
For my size, I'm pretty strong	.44
I'm better coordinated than most people	.63
I'm light on my feet compared to most people	.69
I'm capable of moving quickly	.69

Note: The data for men and women were combined to yield an N of 1,281. Only factor loadings of over .30 are reported; using this criterion, there were no overlapping items.

APPENDIX 8

Normative Data for the Body Consciousness Questionnaire Scales

Means and Standard Deviations on Body Consciousness  
Questionnaire Scales for Men and Women

Scale	<u>Men</u>		<u>Women</u>	
	M	SD	M	SD
Private Body Consciousness	11.7	3.0	12.0	3.3
Public Body Consciousness	15.7	3.6	17.1	3.3
Body Competence	10.5	2.5	10.0	2.5

Note: Based on an N of 275 men and 353 women.