TASK PERFORMANCE AND OBJECTIVE SELF-AWARENESS IN COGNITIVELY ANXIOUS STUDENTS

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ABSTRACT

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Theory suggests that an individual who experiences a large number of cognitive intrusions when anxious will also evidence a high level of distraction during task performance when made highly self-aware (by use of a mirror). This study investigated hypothesized performance decrement resulting from these conditions. One hundred female undergraduates completed measures of trait and state-cognitive anxiety, worry, and cognitive interference. As hypothesized, subjects high in trait-cognitive anxiety scored higher in these areas than those low in such anxiety. Subjects also copied Swedish prose for five minutes. The prediction that those high in trait cognitive anxiety, performing the task in a condition of high objective self-awareness, would evidence the greatest performance decrement of all groups was not supported. Lack of observed performance decrement may be related to the level of absolute anxiety evidenced in the sample. Further considerations and implications for future research was outlined.

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INTRODUCTION

A multitude of variables exist which may be included within the term "individual differences." This study will investigate one specific way in which an individual difference may be manifested: the predominant mode of experiencing anxiety. The crucial question to be examined is this: do individuals react differently under given circumstances based on differences in the modality of the experience of anxiety?

Cognitive anxiety can be described as the presence of cognitive intrusions, thoughts or images, which distract an individual from desired focus of attention. When anxious, varying amounts of attention are those divided between the internal concerns brought about by the cognitive intrusions and what is taking place in the environment.

"Worry" may also be described as a cognitive activity, one which is generally concentrated on anticipated negative consequences of an activity: failing, not doing as well as others, future ramifications of doing poorly, etc.

Objective self-awareness is theoretically present whenever an individual becomes increasingly aware of himself or herself as an object in the world. Attention is focused within on any intraself discrepancy perceived to be salient at that moment.

Thus, an individual who experiences a large number of cognitive intrusions when anxious and who tends to be concerned with the prospect of negative consequences of a personal activity should become even more internally focused and aware of perceived intraself discrepancies when placed in circumstances which increase self-awareness. A person who has difficulty concentrating on a task and experiences self-doubt regarding performance should then become increasingly distracted by these concerns within the objective self-awareness paradigm and should experience more performance decrement as a result.

Although applicable to an infinite variety of circumstances, the problem just described is one which may have great significance in a clinical setting. Individuals will become increasingly self-aware whenever they are reminded of themselves as objects in the world. This may include situations where they feel the object of any sort of personal attention, especially those in which there may be elements of perceived evaluation or judgment. In many ways, then, the therapy process, with its focus on introspection and the process of change, will increase an individual's sense of objective self-awareness.

Clients bring into therapy a host of individual differences which can affect the change process. Individuals prone to rumination and disruptions in concentration when anxious will at times react to the therapeutic process differently than those persons whose concentration and attention are not disrupted or distracted. Because the experience of anxiety may be considered

nearly universal within the therapeutic setting at some point, it is important that clinicians be aware of the differential aspects of anxiety experience.

Cognitive Anxiety

Traditionally, most anxiety questionnaires have reflected the assumption that internal states may be considered as global and undifferentiated (Davidson, 1978). More recently, converging lines of evidence from both the clinical-personality sphere and from peripheral psychophysiology have suggested that anxiety should more properly be viewed as multidimensional in nature.

Investigation of the nature and reduction of fear has found that intercorrelations among measures of fear employed in desensitization are typically low. It was suggested that specific behavioral systems may thus be separately manipulated (Lang, 1969). Psychophysiological research conducted on fear reduction has also revealed a multidimensionality in anxiety. Hodgson and Rachman (1974) observed desynchrony in different physiological measures, all having great face validity. Further research suggested that it might be possible for different subsystems involved in dysfunctional states to be separately manipulated. Lazarus (1973) called for therapeutic regimes to be individually constructed to reduce distressing symptoms in specific modes and systems evidencing difficulties.

The existence of a multidimensional anxiety has been established psychometrically through factor analytic studies of traditional anxiety questionnaires. Barrett (in Schwartz, Davidson, & Goleman,

1978, p. 322) conducted an item analysis of anxiety items from a large number of commonly used scales. Results "'indicated two major subsets: (a) awareness of somatic changes...(and) (b) conscious awareness of unpleasant feelings about self or external stimuli.'" In factor analytic studies of self-rating, Hamilton and Buss (in Schwartz, Davidson, & Goleman, p. 322) found that two factors, which were labeled psychic and somatic anxiety, could account for the majority of the variance in test performance.

Borkovec (1976) has used the multiple measurement of three separate but interacting response components (cognitive, overt behavior, and physiological) to operationally define anxiety. He also suggested that each system might be separately influenced by different environmental conditions and individual differences.

Psychophysiological studies have investigated the specific patterning of physiological processes that are associated with particular behavioral states. Schwartz, Davidson, and Maer (1975) studied hemispheric activation using lateral eye movements as an index. It was found that the complex cognitive tasks employed could be meaningfully differentiated on the basis of underlying hemispheric substrates. Data suggested that the manner in which the verbal-spatial dimension interacts with cerebral asymmetry is different from that of the affective-nonaffective dimension.

A study by Davidson and Schwartz (1977, in Davidson, 1978, p. 432) asked subjects to generate images in different modalities (visual, kinesthetic). Data from EEG measurement of sensorimotor activation reflected a pattern of activation between the two

unimodel imagery conditions. Findings suggest that attention to or the imaging of a stimulus in a particular modality is associated with specific activation in the cortical region specialized to process information in that modality.

Davidson and Schwartz (1976) developed a psychobiological model of subcomponents involved in anxiety and its reduction. The initial assumption was that there exist two relatively independent types of anxiety: cognitive and somatic. It was proposed that different procedures utilized in the reduction of anxiety would differ in the degree to which they affected the cognitive as opposed to the somatic system.

Mode-specific manifestations of anxiety were suggested as also appearing across individuals or within the same person at different times (Davidson & Schwartz, 1976, p. 402). In addition, the presence of subsystems within each mode would tend to determine the particular type of cognitive or somatic symptom. The authors proposed that the direction of the differentiated response to relaxation procedures would depend on asymmetrical activation of either the right or left hemisphere in the given technique employed (p. 402). It was further hypothesized that a process occurring in a given mode would not only strongly affect the same mode, but would also influence other modes to a lesser degree (p. 420).

Following principles of psychobiological specificity, Davidson and Schwartz (1976) conceptualized the systems underlying each mode as having a "fixed" channel capacity. It might be assumed that anxiety in a particular mode will place limits on further processing in that mode more than in others (p. 424).

Schwartz, Davidson, and Goleman (1978) reported a study utilizing adult volunteers, in which it was predicted that physical exercise would lead specifically to reduction primarily in somatic activity with less effect upon cognitive activity. It was also hypothesized that a technique requiring the self-generation of cognitive versus somatic activity would specifically attenuate anxiety in the cognitive system. Data supporting these hypotheses suggested that specific subcomponents of anxiety may be differentially associated with relaxation techniques engaging primarily cognitive as opposed to somatic subsystems (p. 324).

A 14-item self-report measure of cognitive and somatic trait anxiety, the Cognitive Somatic Anxiety Questionnaire (CSAQ), was developed in conjunction with the just-mentioned study. Items were selected from well-known questionnaires and subjected to the agreement of three independent judges. Subjects were asked to rate the degree to which they generally or typically experience the given symptom when feeling anxious (Schwartz, Davidson, & Goleman, 1978, p. 325).

Davidson and Schwartz (1976) described a condition of low cognitive anxiety as representing a lack of unwanted cognitive intrusions. Because of the absence of such intrusions, attention is not distracted by activity in the cognitive sphere.

A high degree of cognitive anxiety would represent a distraction by activity in the cognitive sphere, such as images or thoughts of failing at a task or about an upcoming event irrelevant to the moment in question.

Some specific examples of cognitive anxiety, as reflected by statements on the CSAQ are as follows. For example, when about to speak before an audience and feeling anxious, an individual might experience:

1) uncontrollable thoughts, such as:

   What if they think my remarks are stupid?

2) worries over irrelevant matters, such as:

   I wonder if Mary ever found someone to sit for her kids?

3) trouble keeping anxiety provoking pictures out of mind, such as:

   Picturing the way in which you are standing as awkward and tense.

4) experiencing unimportant thoughts causing bother, such as:

   Thinking about the upcoming workday and having trouble concentrating on the speech.

5) trouble keeping anxiety provoking thoughts out of mind, such as:

   What if my ending doesn't go over as I've planned?

6) terrifying scenes, such as:

   Imagining that suddenly you have forgotten what you are about to say and you stand in front of everyone in total silence.

7) experiencing indecision, such as:

   Should I tell this joke or leave it out?

Individuals exhibiting a high level of cognitive anxiety will tend to have attention focused inward, to their own thoughts and

images. This will divert attention from external objects and events, including any sort of performance task. It has been noted that generally anxious individuals tend to manifest both high cognitive and high somatic anxiety (pp. 426-427).

There is, of course, the question of the accuracy of self-report measures in assessing what is actually being experienced by the subject. In addition, subjects are certainly aware that they are being assessed and respond accordingly. Distortion on the part of subjects may be due to such processes as denial, defensiveness, social desirability, and the subjects' own perceptions (i.e., what personal meaning "anxiety" has for the subject - for example, if anxiety is perceived as a "negative" state, a subject may intentionally reduce the amount of anxiety self-reported).

Also, and of great interest in this study, Kazdin (1980) has commented that depending upon the assessment device and response format, individuals have shown a tendency to check extreme values on rating scales, give cautious answers, and to be inconsistent across items.

Self-report measures, including the CSAQ, will be utilized exclusively in this study. Despite their limitations, the instruments which will attempt to measure the constructs of interest are felt to be the most appropriate existing at this time.

As measured by the CSAQ, the subdividing of anxiety into cognitive and somatic components can be considered an over-simplification. However, authors Schwartz, Davidson, and Goleman (1978) feel that it is a useful starting point for stimulating theory and research (p. 326).

A relatively small amount of literature has reported work with adults and children utilizing the cognitive-somatic anxiety distinction. In addition to the Schwartz, Davidson, and Goleman (1978) study previously mentioned, Kirkland and Hollandsworth (1980) used the CSAQ in a treatment study involving college students. Measures of frequency and intensity (interpreted by the authors as measures of "trait" and "state" anxiety, respectively) of cognitive and somatic anxiety were used in another treatment study for college students by Thompson, Griebstein, and Kuhlenschmidt (1980). A state version of the CSAQ was developed by Heide (1981) in his investigation of relaxation-induced anxiety involving adult volunteers (college students, faculty, and community members). Recently, Fox and Houston (1983) reported the development of self-report measures of cognitive and somatic state and trait anxiety for children. Results of this study indicated a relationship between cognitive trait anxiety and task performance. High cognitive state and/or trait anxiety was also found to be associated with more preoccupation and performance designation. Overall, the authors indicated that results supported the construct validity of the measures developed.

Worry

The multidimensional nature of anxiety has also been reported in the considerable literature concerning test (and evaluation) anxiety. In 1952, Mandler and S. Sarason (in Holroyd & Appel, 1980, pp. 129-130) first attempted to differentiate test anxiety from general anxiety theory. They hypothesized that test anxiety

consisted of both cognitive (feelings of inadequacy and helplessness, anticipation of punishment or loss of self-esteem) and physiological (autonomic arousal) components. This theory was one of a "learned anxiety drive." Evaluative exam situations elicit higher levels of anxiety drive from test-anxious individuals than from the non-test-anxious. As a result, individuals experience higher levels of autonomic arousal and worry. Mandler and Sarason hypothesized that poor test performance resulted because cognitive and autonomic responses elicited by the anxiety drive were incompatible with responses necessary for effective test performance.

Other researchers noted that highly test-anxious individuals tend "to be generally negatively self-preoccupied" and "describ(e) themselves in self-devaluing terms on other paper and pencil measures" (I. Sarason, 1960, in Wine, 1980, p. 355). Sarason suggested that under evaluative stress, such persons respond to heightened autonomic arousal with personalized, self-oriented responses. Attention is directed away from the task and performance suffers (Deffenbacher, 1980, pp. 355-356).

Wine (1980) suggested that test-anxious individuals are likely to interpret a wide range of situations as evaluative and to be tuned to cues from other persons which are interpreted as reflecting evaluatively upon them, typically in a negative way. Self-statements often involve a preoccupation with failures in the past or future negative consequences (p. 376).

Test anxiety is generally viewed by more recent theory as a primarily cognitive response (I. Sarason, 1975, in I.G. Sarason,

1980, p. 131), a typically self-critical response (Mandler, 1975, in I.G. Sarason, 1980, p. 131) which is to be emphasized over individual differences in autonomic arousal when distinguishing the test-anxious from the nontest-anxious. In Mandler's view, all individuals are aroused physiologically by examination situations, but only the test-anxious are preoccupied with self-critical ruminations.

Wine's direction of attention hypothesis (1971; 1982) has also emphasized the significance of the cognitive element in test and evaluation anxiety. She observed that during task performance and under evaluative testing conditions, the attention of highly test-anxious persons is divided between task-relevant variables and internally focused, self-depreciating thinking and perception of autonomic reactivity. Wine (1982) has also suggested that "evaluation anxiety" cuts across state/trait distinctions. Individuals scoring high on self-report measures of trait anxiety, "whether general or situationally specific, are prone to becoming worried and tense" (p. 208). Thus they will tend to report high levels of state anxiety given appropriate situational circumstances.

Although Mandler and S. Sarason (1952) had suggested the dual component nature of test anxiety, it was not until 1967 that research of Liebert and Morris began to oppose the existing trend toward a lack of operationalism and the treatment of state anxiety as a uniform condition. Components of Mandler and Sarason's Test Anxiety Questionnaire (TAQ) were examined by factor analytic techniques. Two classes of factors appeared to emerge: cognitive ("worry") or lack of confidence, and factors which referred to

various indices of autonomic arousal ("emotionality"). The Liebert and Morris 10-item worry-emotionality questionnaire was then utilized in a study of university undergraduates which suggested the inverse relationship of worry to performance expectancy (Liebert & Morris, 1967). The scale reflected momentary state anxiety and was expected to fluctuate with conditions related to any given situation.

"Worry" has been described as primarily a cognitive concern regarding the consequences of failing, the ability of others as opposed to one's own ability, etc. Examples of "worry" might include:

1) consequence of failing, such as:

> If I fail this exam, I know I'll fail the entire course and never make it in this major.

2) ability of others, such as:

> I feel so stupid. I know that everyone else is getting these problems so easily.

Wine (1971; 1982) suggested that it was this cognitive (1982) or "worry" (1971) component of evaluation or test anxiety which interferes most directly with cognitive performance (1982, p. 209). It also appears closely related to the attentional interpretation previously described (1971, p. 99). Wine also believed this cognitive component to be the more stable, serving as a "trigger" for heightened physiological activity (1982, p. 209).

"Worry" appears to be the anxiety component most consistently and most strongly related (inversely) to academic performance. There appears to be a weak or no overall relationship between

performance and the "emotionality" component (Deffenbacher, 1980; Doctor & Altman, 1969; Morris & Liebert, 1970).

In all studies involving evaluative stress, "worry" has been found at higher levels than "emotionality." Highly trait-anxious individuals have reported significantly more "worry" than "emotionality." Thus, evaluative stress appears to elicit a tendency for the highly test-anxious to become preoccupied with worrisome cognitions and only secondarily with self-perceived affective-autonomic arousal (Deffenbacher, 1980, p. 123). Physiological arousal may at some point begin to interfere with performance, but in the sense that an individual's attention may be directed toward the arousal and away from the task (p. 123). The discovery that highly test-anxious persons report significantly more "worry" than "emotionality" thus suggests that previously mentioned characteristics of the test-anxious will also apply to those scoring in the higher range of the "worry" dimension of this measure.

"Worry" and "emotionality" appear to be different response classes elicited by different conditions. Not only does the presence or absence of evaluative stress seem associated with varying levels of worry, but a temporal relationship has also been suggested. "Emotionality" is elicited primarily by cues associated with the beginning of evaluation and peaks at its initiation. "Worry" appears elicited by cues which make evaluation and possible failure salient and covaries with input or feedback related to possible failure (Deffenbacher, in I. Sarason, 1981, pp. 122-123).

Therefore, in addition to efficiacy performance during exams or other tasks, "worry" should be significantly elevated prior to such situations, making it more likely to interfere with preparation (including learning and rehearsal [p. 121]).

In summary, "worry" appears to be a stable disposition, with scores which are fairly constant across time, that interferes directly with cognitive performance, triggers autonomic activity, and plays a major role in the maintenance of test and evaluation anxiety (Wine, 1982, p. 212). It is possible that worry, as a particular kind of cognitive intrusion, may constitute a subtype of cognitive anxiety.

The "worry-emotionality" measure to be used in this study was developed by Morris, Davis, and Hutchings (1981) as a combination-revision of 40-items from previous scales (Liebert & Morris, 1967; Spielberger et al., 1970; Spielberger, Gorsuch, & Lushene, 1970; Osterhouse, 1972). "Worry" items chosen reflected specific negative expectations as well as preoccupation with performance, self-evaluation, and a concern about the perceptions of others. "Emotionality" items involved specific physiological and somatic reactions as well as the use of terms which suggested overarousal, nervousness, and general affective discomfort. All of the original (1967) "emotionality" items from the Liebert and Morris questionnaire were retained, while only two of the original "worry" items were judged as "satisfactory" (Morris, Davis, & Hutchings, 1981, p. 549). This study, as in the 1967 Liebert and Morris work and nearly all other mentioned studies, involved university

undergraduates. It was conducted for the purpose of producing the revised scale and exploring further theoretical considerations.

In addition to the studies mentioned above, the use of a dual-component theory of test or evaluation anxiety, involving cognitive (worry) and emotionality distinctions has been reported in investigations of feedback and test performance (Morris & Fulmer, 1976), sources of interference while performing under evaluative stress (Deffenbacher, 1978), effects of timed and untimed testing conditions on high-worry subjects (Morris & Liebert, 1969), and in treatment studies, such as those of Kirkland and Hollandsworth (1980) and Finger and Galassi (1977).

Objective Self-Awareness

The same cognitive processes labeled as anxious self-preoccupation or self-focusing in test anxiety theory (Wine, 1971) "(appear) to be labelled objective self-awareness or self-focused attention" in objective self-awareness theory (Holroyd, Westbrook, Wolf, & Badhorn, 1978, p. 443).

In 1972, Duval and Wicklund defined the state of objective self-awareness as one in which persons take themselves to be objects (Holroyd et al., 1978, p. 233) in the world. In this state of "self-focused attention," it was postulated that as a result of events which focus attention inward, an individual would concentrate specifically on an intraself discrepancy. Theory assumed that negative affect, with self-criticism appearing to be the most likely (Hull & Levy, 1974, p. 245), will result because the individual will presumably find shortcomings within him/herself.

These shortcomings will be the consequence of perceived discrepancies between aspiration and attainment. Originally, Duval and Wicklund thus believed that objective self-awareness would be aversive condition.

However, conscious attention focused on self or on external events (subjective self-awareness) was not seen as a dichotomous situation. It was allowed that attention could oscillate between the self and the non-self. Therefore, it is more accurate to speak of proportionate "increased" or "decreased" objective self-awareness (Hull & Levy, 1974, p. 234).

In their original statement of self-awareness theory, Duval and Wicklund (1972) suggested that following the development of negative affect, individuals would first attempt to avoid the self-focus stimulus by finding distractions. If such avoidance were impossible, they would then engage in some sort of discrepancy reduction. Typically, this would involve "efforts to bring a trait or behavior in line with a (personal) standard or aspiration" (Hull & Levy, 1974, p. 236). If no behavioral standard is salient at that moment, self-attentive persons may simply become more conscious of their own present attribution or feelings. They will tend to be more aware of dominant affect and more responsive to that affect (Carver & Scheier, 1978, p. 324).

Later expansion of objective self-awareness theory suggested that it is possible for either negative or positive affect to result depending upon whether attention is directed toward a negative or positive discrepancy. Although evidence from the area of achievement motivation has suggested that virtually all

naturally occurring discrepancies are negative, they may be rendered positive by "recent" success experiences (Hull & Levy, 1979).

Such self-focused attention may also be thought of as a type of self-confrontation. Sackheim and Gur (1978) have stated that feedback of self will lead to autonomic arousal, negative self-evaluations, defensive reactions, and constriction of ideational content. Subjects' phenomenological reports of their experience during self-confrontation generally describe negative affective states of increased anxiety. Self-confrontation may thus be described as aversive (p. 159).

Any stimulus which reminds individuals of their object status will increase objective self-awareness. In theory, "any symbol or reflection of a person will cause a shift of (his/her) focus inward" (Wicklund, 1975, p. 234). The mirror has become the "clear favorite" among researchers as a means of heightening self-focus because of its simplicity and ease of manipulation (Carver & Scheier, 1978, p. 325).

Numerous studies utilizing a mirror to produce objective self-awareness have been conducted with university undergraduates (Davis & Brocke, 1975; Duval & Wicklund, 1973; Holroyd, Westbrook, Wolf, & Badhorn, 1978; Hull & Levy, 1979; Ickes, Wicklund, & Ferris, 1973; Paulus, Annis, & Risner, 1978).

Contrary to original predictions, Wicklund and Duval (1971) observed that subjects' performance on a prose-copying task was facilitated in the presence of a mirror. The same experimental

task was repeated by Liebling and Shaver (1973), varying levels of evaluation. The authors suggested that there appeared to be an inverse relationship between level of evaluation and performance facilitation. When subjects were placed in a highly evaluative situation, objective self-awareness was related to a decrement in performance.

Questions of mirror validity have generally not been dealt with in the studies mentioned. Wicklund (1975) explained this lack of examination of manipulation checks and validity issues by stating that attempted manipulation checks are "probably worthless in objective self-awareness paradigms" (p. 267). Wicklund's reasoning was as follows. Ideally, a manipulation check should investigate whether a subject's attention has moved to some salient dimension within the self. After the primary dependent measure is completed, an individual might be asked to rate the degree of self-consciousness with respect to that dimension. However, objective self-awareness theory would also predict that any direct question of this kind would, in itself, bring the individual's attention directly to bear on the dimension of interest. As a result, there will be "a washing-out" of the prior manipulation. In describing the extent of self-consciousness, it would be highly probable that a subject might be using the experimental manipulation as a cue for an appropriate answer (p. 268).

One attempt at validation of the mirror was conducted by Carver and Scheier (1978). The Self-Consciousness Scale (SCS) (Fenigstein, Scheier, & Buss, 1975) was used to measure chronic

dispositions to be self-attentive. Results indicated that the "mirror does manipulate, and the private self-consciousness subscale of the SCS does measure, self-attention" (p. 324). A person high in private self-consciousness would be very cognizant of his or her own thoughts, feelings, and motives.

Duval and Wicklund (1972) have argued that when individuals are in a state of objective self-awareness, they will evaluate perceptions of self and their behavior in terms of individual standards of correctness (in Sachkeim & Gur, 1978). However, the Duval and Wicklund theory as a whole places little emphasis on the role of individual differences in predicting reactions to self-focus or self-confrontation. Sackheim and Gur (1978) have contended that if individuals differ to the degree to which they hold discrepant cognitions regarding the self or in the way in which they assess the evaluative nature of situations, "one would expect that they would also differ in their reactions to self-confrontation" (p. 164). Evidence has suggested that when self-confronted, individuals perceive aspects of themselves they do not like. The perception of such discrepancies is suggested to be aversive and reflected in heightened anxiety. This position would be congruent with the findings of Sackheim (in Sackheim & Gur, 1978, p. 167) which have indicated that individual differences in cognitive discrepancy, a measure of the degree of internal conflict, "predicted individual differences in the magnitude of psychophysiological reactivity to self-confrontation and the type of self-evaluations subjects made after such a confrontation" (p. 167).

In a similar conclusion to the Liebling and Shaver findings, Sackheim and Gur have suggested that the anxiety engendered by self-confrontation at first facilitates task performance, but at "high levels" produces decrements (p. 169).

An individual's tendency to exhibit trait and state-cognitive anxiety and worry to varying degrees certainly constitutes an example of individual differences which may prove to be important variables affecting individual reactions to a state of objective self-awareness. Cognitive anxiety usually involves worrisome, preoccupying thoughts or unpleasant feelings about self or external stimuli. "Worry," as described in the test anxiety literature, generally involves cognitive concern about the consequences of performance (Fox & Houston, 1983, p. 862). An individual possessing a high amount of cognitive anxiety and worry should, as a result of this predisposition toward self-concern, react differently from those lower in such tendencies when made self-aware.

This study investigated the effects of the state of objective self-awareness or self-focus on the task performance of subjects high in cognitive anxiety. Because the cognitively anxious tend to experience more preoccupying thoughts or unpleasant feelings about self or external stimuli, it was hypothesized that the state of high objective self-awareness will interact with and exacerbate this tendency, lead to an increasing amount of distraction away from the task, and thus result in a larger decrement in performance when compared to the low cognitively anxious.

As previously mentioned, objective self-awareness, especially for individuals prone to cognitive anxiety and worry, may also be

considered a self-confrontation situation. The clinical importance of individual differences in reaction to such a state rests with the fact that objective self-awareness/self-confrontation may be produced by a variety of situations. In addition to mirrors, cameras, videotape equipment, or a tape recorder (the last two often used in certain clinical settings) may have the same effects. As mentioned, a situation in which individuals feel that they are being significantly evaluated will also lead to a state of objective self-awareness. The therapy experience, in general, may be viewed in this way by certain clients. Certain techniques within the therapy process, such as role-play, or merely the disclosure of difficult and painful material, may also produce an intensely heightened state of self-focus.

Predominant mode of experiencing anxiety is but one of countless individual differences which may affect an individual's reactions to objective self-awareness/self-confrontation. Once again it is vital that clinicians be aware of these possible differences in situation perception and situational changes in attitudes toward self and others' perceptions of self as a result of therapeutic techniques or the clinical setting as a whole.

Structure of the Study

The diagram on page 35 describes the administration of the measures in this study.

Measures of state-cognitive somatic anxiety and worry-emotionality were completed prior to the introduction of the copying task. It was predicted that those subjects high in trait-

cognitive anxiety should not only score more highly in such state anxiety, but also reflect more situational worry, basically a cognitive concern. While it was possible that subjects in the extreme high range of both cognitive anxiety and worry would also evidence high scores in somatic anxiety and emotionality, it was felt that any decrement in performance would result chiefly from cognitively-based anxiety. This interpretation has been covered particularly well in the theoretical aspects of the worry-emotionality and direction of attention hypothesis literature (refer to those sections of the Introduction).

Cognitive-somatic and worry-emotionality measures have occasionally been used within the same study (Kirkland & Hollandsworth, 1980), with both cognitive anxiety and worry scales utilized as "cognitive attentional measures." However, it must again be stressed that cognitive anxiety, as measured by the CSAQ, and "worry," as described in the Revised Questionnaire," while similar in their cognitive orientation, are not to be considered the "same" measure. Another purpose of this study was the statistical investigation of the relationship between these two measures. It initially appeared that cognitive anxiety was a more general concept involving a wide variety of different cognitive intrusions, while "worry" appeared to be a more specific concern regarding the anticipated negative consequences of an evaluative or perceived evaluative situation.

A second administration of the State-CSAQ and Worry-Emotionality Questionnaire followed the (post-task) Cognitive Interference Questionnaire. As reflections of situational anxiety,

it was predicted that for subjects high in trait-cognitive anxiety, scores of state-cognitive anxiety and worry would increase by a greater amount pre- to post-task than scores of those low in such trait anxiety. As noted on page 14, it has been demonstrated that worry appears to be a more constant, stable tendency throughout the period of evaluation/performance, while emotionality peaks at the beginning of this period, then generally declines. Therefore, those subjects evidencing a high worry score (those subjects also predicted to score "high" in trait, then in state-cognitive anxiety prior to the introduction of the task) should have retained this cognitive state through to the administration of the final (Post-Task) measure. Investigation of any similar pattern for state-cognitive anxiety became an additional hypothesis.

Because the use of direct questions, themselves, would tend to produce a state of objective self-awareness, inquiries concerning subject awareness of distraction during the task (specifically the notice of the mirror and perception as a distraction) could not be used as validation of the effectiveness of this manipulation. Yet it was felt that such information on an informal basis would add to further understanding of subject experience. It was predicted that those high in trait and state-cognitive anxiety would report more environmental distraction while performing the task. Specifically, those subjects high in trait-cognitive anxiety and those in the mirror condition would more often acknowledge notice of the mirror and perceive it as a distraction during the copying task.

A final consideration in structuring this study involved the choice of rationale and the relationship between experimenter and subject during the experimental phase of the study (copying task). It was noted that evaluation apprehension by itself would increase objective self-awareness. An individual concerned about whether his or her performance would be judged favorably would also be aware of possible discrepancies between his or her present state and the goal desired (i.e., performing well). Therefore, the rationale given to subjects stressed the cooperative nature of the study and no indications were given in the instructions that subject performance was to be evaluated (refer to Rationales and Instructions in the Appendices).

In addition, the subject-experimenter relationship generally involves experimenter control of the subject, behavior implying that the subject is an object in the world (Duval & Wicklund, 1973). This would provide a strong stimulus for heightened objective self-awareness. Experimenter presence or communication that the subject will be otherwise monitored may also be an additional such stimulus (p. 30). It was therefore necessary to attempt to diminish nonmanipulated sources of objective self-awareness, leaving the mirror as much as possible its major source. For this reason, the experimenter remained outside of the room and with the exception of the copying task, itself, the subjects were able to work at their own speed.

Finally, no direct mention was made to the subjects of the mirror or its plywood back when turned to face away from the

subject. In this way, it was hoped that subjects' attention would not be drawn to the mirror by direction of the experimenter. Instead, the subject would notice her reflection (or the plywood back) in a natural fashion as she sat down at the desk.

Hypotheses

In summary form, the following are the hypotheses investigated in this study. To aid in the understanding of the hypotheses, the diagrams of the measures used and of the four groups of subjects are presented here.

Cognitive Anxiety (trait-CSAQ)

reflective surface of the mirror (i.e., high or low objective self-awareness produced)		High	Low
	Yes	high/ mirror	low/ mirror
	No	high/no reflective mirror	low/no reflective mirror

"high" = upper half of subject distribution

"low" = lower half of subject distribution

	Screening phase	Pre-task	Copying task	Post-task
Measures:	CSAQ-trait ⟶	CSAQ-state worry-emotionality mood check (emotion wheel) ⟶	(performance measure) ⟶	cognitive interference questionnaire, CSAQ-state worry-emotionality, Post-task questionnaire

Note. Data was analyzed in terms of mean scores for each group.

Hypotheses:

1. Those "high" in trait-cognitive anxiety (scoring in the upper half of the trait-CSAQ distribution)* will also score higher in (a) state-cognitive anxiety and higher in (b) "worry" than those "low" (lower half of distribution) in trait-cognitive anxiety.

2. Those "high" in trait-cognitive anxiety will evidence greater performance decrement than those "low" (scoring in the lower half) in cognitive anxiety.

Note: performance on the copying task will be analyzed by taking the mean number of letters copied correctly for each group.

3. Those "high" in trait-cognitive anxiety, performing the task in a condition of high objective self-awareness (i.e., before the reflective surface of the mirror) will experience the greatest performance decrement of the four groups.

Using the results of the post-task measures:

4. Those "high" in trait-cognitive anxiety will evidence higher (a) state-cognitive anxiety and higher (b) worry scores in both pre- and post-task measurements than those "low" in trait-cognitive anxiety.

5. Those in the high trait-cognitive anxiety/"high" objective self-awareness group will evidence the highest (a) state-CSAQ and (b) worry scores of all four groups after completing the copying task and (c) state-CSAQ and worry scores will increase pre- to post-task by a greater amount than other groups in terms of mean increase.

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*Mean trait-cognitive anxiety scores and trait-CSAQ ranges for "high" and "low" groups appear in the Appendix for the 2 x 2 design.

6. Those "high" in trait-cognitive anxiety (and state-cognitive anxiety and worry) will evidence a higher amount of cognitive interference during the experiment than those "low" in trait- and state-cognitive anxiety, and

7. Those in the "high" cognitive anxiety/"high" objective self-awareness group will evidence the highest cognitive interference scores of all groups.

8. Those "high" in trait-cognitive anxiety (and state-cognitive anxiety and worry) will (a) report noticing the presence of the mirror (both reflective surface and nonreflective back) more frequently and (b) more often claim that it was a distraction than those "low" in trait-cognitive anxiety, and

9. Those in the "high" trait-cognitive anxiety/"high" objective self-awareness group will report (a) noticing the presence of the mirror and (b) seeing it as a distraction more often than any other group.

METHOD

Subjects

One hundred female undergraduates at a large midwestern university were given the trait version of the Cognitive Somatic Anxiety Questionnaire (Schwartz, Davidson, & Goleman, 1978) and at a later date participated in the experimental phase (copying task) of the study. All subjects were currently enrolled in one of six different courses (introductory psychology, personality psychology, and abnormal psychology). Students in the introductory classes participated in this study for extra credit. Students from personality and abnormal psychology classes were not part of the official subject pool and received no extra credit. The number of subjects from each class was as follows:

Introductory Psychology I (Section 1) = N = 56

Introductory Psychology I (Section 2) = N = 3

Introductory Psychology II (Section 1) = N = 4*

Introductory Psychology II (Section 2) = N = 1

Personality Psychology = N = 25

Abnormal Psychology = N = 11*

Following administration of the trait-CSAQ, all subjects were randomly assigned a number 1-100. Subjects receiving an odd number (n = 50) performed the experimental task before the plywood back of

*One case excluded for data analysis.

the mirror. Subjects receiving an even number (n = 50) were assigned to the mirror-present condition. Following the completion of data collection, subjects' cognitive anxiety scores from the trait-CSAQ were tabulated, a median split conducted, and subjects thus assigned to "high" and "low" trait-cognitive anxiety groups.

Materials

The experimental (copying) task was performed in front of a large mirror (35½" x 47½"). One side was the usual reflecting surface and the other side a nonreflecting, plywood back. The experiment was conducted in a small windowless room (8'6" x 12'). Other objects in the room included a desk on which students worked, a mirror propped on top of the desk against the wall at an angle of approximately 70^0, a straight-back chair, and a filing cabinet. Paper and pencils for the subjects' participation had been placed on the desk top before the subject entered the room.

Instruments

The Cognitive Somatic Anxiety Questionnaire (Schwartz, Davidson, & Goleman, 1978) was administered in its trait form for the purpose of dividing the subject population into groups of "high" and "low" trait-cognitive anxiety. Both cognitive and somatic scores were recorded for each subject, but only the cognitive score was utilized for subject division and for analyses to address the specified hypotheses.

A State version of the Cognitive Somatic Anxiety Questionnaire (Heide, 1981) was administered to all subjects both prior to and following the completion of the copying task. The purpose of this

instrument was to assess the level of cognitive and somatic anxiety currently being experienced. Once again, only cognitive anxiety scores were used in the statistical analysis. The State-CSAQ was originally developed as part of a study concerning relaxation-induced anxiety. Therefore, a number of the items were worded to assess the amount of relaxation experienced. For purposes of this study, all such items worded to reflect amount of current relaxation were scored in reverse. For example, if a subject gave a rating of "2" for the statement: my mind feels calm, a "6" was recorded as the amount of anxiety being experienced. In this way, scoring was consistent with the statements designed to measure state anxiety on a 1 (NOT AT ALL) through 7 (VERY MUCH SO) scale.

The Worry-Emotionality Questionnaire (Morris, Davis, & Hutchings, 1981) was also administered before and after the experimental task for the purpose of ascertaining the degree of worry currently being experienced. Emotionality scores were recorded, but not used in data analysis.

Following the pre-task administration of the State-CSAQ and Worry-Emotionality Questionnaires, subjects were asked to indicate by setting a pointer on an "emotion wheel" what they felt to be their predominant mood at that moment. The instrument used was a modification of the "emotion wheel" developed by Plutchik (1980). For this study, the emotions included on the "wheel" were confined to Plutchik's "eight primary emotions" (a diagram of the "wheel" used appears in the Appendices).

In addition to the presence of anxiety affecting performance on a copying task, depression may also produce differences in

outcome. The copying task in this study was felt to be similar to the Digit Symbol subtest of the Wechsler Adult Intelligence Scale (WAIS). Both tasks ask individuals to copy as much material (letters in this study or symbols in the Digit Symbol subtest) as they can in a given amount of time. As in the Digit Symbol test, this copying task primarily measured a subject's capacity to utilize energy in a simple task. A high level of anxiety might cause difficulties in concentration and the ability to focus energy on the task, alone. Poor performance on such a task may also reflect a depressive lack of energy output (Blatt & Allison, 1981).

The purpose of using the "emotion wheel" in this study was to provide some exploratory information concerning any possible depressive affect ("sadness" on the Plutchik "wheel") among individual subjects. It was felt that this and other information regarding subjects' affective states might contribute valuable information for the overall analysis and interpretation of study data. In addition, studies by Scheier and Carver (1977) and Scheier, Carver, and Gibbons (1981) both indicate that self-focused attention heightens an individual's awareness of and responsivity to affect.

All subjects were asked to copy a sample of Swedish prose for a period of five minutes. Performance scores were based on the number of letters, marks of accent, and punctuation copied correctly during that time period.

Following the copying task, subjects were asked to complete the Cognitive Interference Questionnaire (Sarason & Stoops, 1978)

to assess the types and frequencies of thoughts which they may have experienced while working on the task. The use of the Cognitive Interference Questionnaire (CIQ) was reported in a study with female university undergraduates. Data indicated that highly anxious persons under stress experience cognitive interference and preoccupation which result in poor performance (Sarason & Stoops, 1978). The CIQ, which results in a single, global score, also requests a self-report of the degree to which subjects' minds "wandered" during the task.

The final measure presented to the subjects was a short questionnaire (Post-Task Questionnaire) designed to investigate especially the degree to which the presence of the mirror or plywood backing was recognized and then perceived as a distraction by subjects in their appropriate groups.

The "emotion wheel," Cognitive Interference Questionnaire, and Post-Task Questionnaire were presented at the same points during the study for all subjects. The State-CSAQ and the Worry-Emotionality Questionnaire were presented in counterbalanced order.

Procedure

A procedural diagram of the study appears in Figure 1.

The screening and experimental phases of this study were conducted by a total of five persons, this writer and four female undergraduates (three psychology majors, one speech and audiology major) who had undergone a training period of approximately five weeks to become familiar with the instruments and with the experimental procedure. In this way, it was possible to include

more subjects in the study, as well as to deal with the issue of experimenter bias. During that time, they had been familiarized with the experimental procedure and had the opportunity to work with pilot subjects. Although these four undergraduates had knowledge of the general topics involved in this study and to which experimental condition each subject had been assigned, they remained unaware of the subject's trait-cognitive anxiety grouping (as did this writer at that time) and of the specific hypotheses to be tested.

Volunteers for this study were solicited from the six classes previously specified. Those who wished to participate for credit (from the four sections of the two introductory classes) signed up for the initially scheduled screening sessions, at which time they were administered the trait-CSAQ. These subjects had been informed that the screening session would be the first part of a two-phase study. They received credit for participation in each phase. After arriving at the screening session, subjects were given the following rationale:

> We are conducting a pilot study for a project in which subjects will copy written material of graded difficulty. Before we begin the study, we need to know just how similar subjects will be on certain variables.
>
> Therefore, we are asking you to take the next few minutes to complete first the consent form, then the questionnaire being distributed.

Subjects were told that the times listed on the consent form (refer to Appendix) for each phase of the study might vary, but that they would receive appropriate credit for all participation.

It was also mentioned verbally (as well as included on the consent form) that subjects' signatures did not commit them to participation in the second phase of the study, should they be recontacted, although it was hoped that they would choose to continue. Only six of the originally-screened subjects later decided not to participate in the copying task (second) phase.

Following completion of the trait-CSAQ, subjects were told that they might possibly be recontacted within the next week to arrange a time to participate in the next phase of the study.

Subjects who had signed up for a specified screening time, but missed their session, were rescheduled. Screening times had been scheduled for only one week due to time pressures. If rescheduling was not possible during that week, subjects were given a copy of the consent form and trait-CSAQ to complete prior to returning for the experimental phase. By the end of the scheduled week of formal screening, it had become apparent that there was a severe lack of available subjects from the introductory (credit) classes. To achieve the power desired for statistical analysis, a sample of at least 100 subjects was strongly preferred. For this reason, it was necessary to look beyond introductory psychology (subject pool) courses and use volunteers from other psychology classes. This same procedure of having subjects complete the consent form and CSAQ outside of a formal screening session was also followed for subjects from the two classes not participating for credit. In all cases, however, subjects were given the same rationale and basic instructions.

Diagram of Procedure:

NOTE: During the experiment, state-CSAQ and Worry-Emotionality Questionnaire will be administered in counterbalanced order for all Ss.

1 → 2 → 3 → 4

Requested female volunteers in as many introductory and upper-level classes as possible; given initial rationale; administered trait-CSAQ either in formal screening sessions or outside prior to second phase of study: screening out all familiar with Swedish, Norwegian, or Danish (students in these introductory classes received 1 ½ hour credit for this phase and told that they might receive 1 or 2 more credits if they go on to complete the study).

Decision made to use all volunteers and divide subject population with median split; all subjects to be recontacted.

Data collection schedule developed. Each subject assigned a number 1-100, a corresponding experimental condition (mirror or plywood), and given an assigned time to report to the room specified for the experiment - there were 5 experimenters (myself and 4 others trained during Winter term), alternating in the running of Ss throughout the term - there was as equal a time load as possible between the 5 of us.

Subject given rationale for study & basic instructions explained for the step-by-step procedure before the S entered the room (instructions were also written on each piece of material), E gave S the first measure to be completed; S entered room; when measure completed, slipped the completed questionnaire under the door; E slipped next measure under door to S and the same procedure followed as before. Measures:
a) state-CSAQ
b) Worry-Emotionality Questionnaire
c) "Emotion Wheel"

5 → 6 → 7

After S completed state-CSAQ & Worry-Emotionality Questionnaire & Emotion Wheel, E slipped copying task under the door; S had already been told how to procede & written instructions repeated this; S signaled with a knock when ready to begin & E began timing; 5 minutes later, E knocked at door & S stopped task and slipped copying material under the door. (S had not been told that the task would take 5 minutes specifically - E had indicated that she would signal when S to stop).

Post-task measures administered in the same procedure as in #4:
a) state-CSAQ
b) Worry-Emotionality
c) Cognitive Interference Questionnaire
d) Post-Task Questionnaire; once last questionnaire completed, S slipped this under door & E entered the room.

S told that because many Ss in the same classes were still to be run, debriefing would take place at the end of the term (or data collection period) - a written debriefing was sent to each S & she was given the chance to ask questions both at the conclusion of the experiment, itself, and after debriefing distributed; S also told that she (all Ss) might receive a copy of the abstract when the study was completed. If S would like a copy, she should indicate this now or the next Fall term.

Figure 1. Procedural diagram of study, subject selection through experimental phase.

Following completion of all trait-CSAQ questionnaires, either in formal screening sessions or outside, subjects were assigned a number from 1-100, contacted by phone, and scheduled for participation in the second phase of the study.

Prior to the start of the experimental phase, five pilot subjects had been conducted through the experimental procedure by all five experimenters. As a result of information gained from this pilot, experimental instructions were altered slightly and the time frame for this second phase shortened from 45-60 minutes to a maximum of 30 minutes, a change of which subjects were informed when scheduled for the experimental phase.

This experimental phase involved subject participation of approximately 20 minutes. Upon subjects' arrival at the specified location, the experimenter gave the following rationale:

> As we mentioned before, this is a pilot study for a project in which subjects will copy written materials of graded difficulty.
>
> Before we can perform any study on the effects of varying levels of difficulty, we must establish a scale to measure the difficulty of written material. This is what you will be helping us do in this pilot study.
>
> By measuring how much of a given written material a random sample of people can copy accurately, we can not only rank order different materials by difficulty, but we can see how much harder one passage is to copy than another. (Liebling & Shaver, 1973). You will be copying material of one level of difficulty and other subjects will be copying material of other levels.
>
> Because this is a study to establish a scale of measurement, we need to find out just how similar participating individuals are in certain ways. Therefore, we will also be asking you to complete some questionnaires before and after the copying task, itself.

The subject was then given the instructions for completion of this phase of the experiment.

> To prevent distraction, I will be outside the room throughout the experiment. I will be giving you the first measure as you enter the room. Please sit at the desk to your left. You will find pencils and paper for the copying task on the desk. When you finish the first questionnaire, slip it under the door and I will slide the next measure in to you (Experimenter demonstrates). Follow this procedure for the first three measures. All instructions for completing these measures also appear on the instruments, themselves.
>
> After the third measure, I will slide the copying task under the door. Please read the instructions carefully. When you are finished and are ready to begin, knock twice on the door (Experimenter demonstrates). When you have two knocks in return, you may begin copying the Swedish prose, by printing, on the paper you will find on the desk. When you hear a second double-knock (Experimenter demonstrates), stop copying immediately and slide all materials under the door. I will then slide the next measures in to you.
>
> Following the copying task, there will be four short questionnaires for you to complete. Please follow the same procedure of sliding the completed measures under the door. After the fourth questionnaire is completed, I will come into the room and you will be able to ask any questions you might have.

Once the instructions were given to the subject, the experimenter handed her the first measure, opened the door and gestured to the desk at the left. The experimental procedure then proceeded as outlined. Pre-copying task measures were: State-CSAQ, Worry-Emotionality Questionnaire (these two instruments were presented in counterbalanced order both pre- and post-task), and "Emotion-Wheel." Post-task measures were: Cognitive Interference

Questionnaire, State-CSAQ, Worry-Emotionality Questionnaire, and the appropriate Post-Task Questionnaire (either "mirror" or "plywood").

Following completion of the final (Post-Task) questionnaire, the experimenter entered the room. It was explained that a complete, written debriefing would be sent to each subject after all data was collected, but that the subject could ask questions or make comments at that time if she wished (it was stressed that since many subjects were enrolled in the same classes, certain aspects of the experiment could not be explained until completion of data collection). A written debriefing (refer to Appendix) was mailed to all subjects during the eighth week of the term. Subjects were also told that if they would like a copy of the study abstract, they should either indicate so at that time or contact this writer during the following two terms.

RESULTS

Initial frequency data were obtained for all variables prior to statistical analyses. At this time it was noted that two performance scores appeared to be in the upper extreme of a distribution ranging from 238 to 710. (Subjects had been given two pages of Swedish prose. The high score of 710 represents less than one (the first) page copied during the five-minute period.) Two scores of 703 and 710 were felt to be "outlyers" and the data sets for these two subjects were discarded. The highest score then became 650. Both sets belonged to the same group (high cognitive anxiety/plywood) and these two performance scores proved to be at least three standard deviations above the mean for that group. All further analyses were conducted with a total sample $\underline{N}$ = 98. A breakdown of all subject numbers will be presented on each table of means and standard deviations.

Before conducting the a priori contrasts used to test hypotheses one through nine, a series of analyses of variance were computed to investigate any presence of statistically significant differences between groups overall. Variables included in these analyses were: trait-cognitive anxiety; state-cognitive anxiety (pre- and post-task); worry (pre- and post-task); the performance (copying) task; cognitive interference; and pre-post-task difference scores for state-cognitive anxiety and worry. Results of these analyses appear in Table 1.

Table 1

Analysis of Variance Results
for Dependent Measures

Measure	df	f	
Trait-Cognitive Anxiety	3,94	58.537	$p < .01$*
State-Cognitive Anxiety (pre-task)	3,94	4.674	$p < .01$*
Worry (pre-task)	3,94	2.966	$p < .05$*
Performance (Copying) Task	3,94	1.922	$p > .10$
Cognitive Interference	3,94	4.471	$p < .01$*
State-Cognitive Anxiety (post-task)	3,94	5.922	$p < .01$*
Worry (post-task)	3,94	3.606	$p < .05$*
State-Cognitive Anxiety - Difference pre- to post-task	3,94	1.062	$p > .30$
Worry - Difference pre- to post-task	3,94	.617	$p > .60$

Note. *denotes statistical significance.

Reliability of Measures

Reliabilities were obtained for each measure used in this study. A complete listing can be found in the Appendix. Reliabilities ranged from a high of .89 (Pre-Task Worry-Emotionality Questionnaire) to a low of .78 (Cognitive Interference Questionnaire). Item 11 of the Cognitive Interference Questionnaire had a corrected item-total correlation of -.099 and was omitted from the subsequent analysis. The reliability of .78 for this instrument reflects this omission.

A reliability was also obtained for the Post-Task Questionnaire (.42). This measure was never used as a whole, however. Two items (Items 1 and 2) were considered as separate variables intended to produce information regarding frequency and intensity and analyses (Hypotheses 8 and 9) were conducted for these variables separately.

Hypotheses

Hypotheses one through nine were evaluated by a priori contrasts and one-way analyses of variance using the following 2 x 2 factorial design.

		Trait-Cognitive Anxiety: High	Trait-Cognitive Anxiety: Low
Objective Self-Awareness	Mirror	1	3
	Plywood Back	2	4

Objective self-awareness refers to the experimental condition which was hypothesized to produce such self-awareness at either high (mirror) or low (plywood back) levels. Each cell is numbered for the reader's convenience to correspond to the groups which are

compared in the hypotheses. Means and standard deviations for trait-cognitive anxiety scores for this design are presented in the Appendix. Means and standard deviations for each variable tested in the hypotheses are presented in Tables 2-9.

1) Hypothesis 1(a) predicted that those subjects high in trait-cognitive anxiety (groups 1 and 2) will evidence higher state-cognitive anxiety scores (pre-task) than those subjects low in trait-cognitive anxiety (groups 3 and 4). Means and standard deviations are presented in Table 2, indicating higher mean state-cognitive anxiety scores for the predicted group.

Table 2

Means and Standard Deviations of Pre-Task State-Cognitive Anxiety Scores

Objective Self-Awareness	Trait-Cognitive Anxiety			
	High		Low	
	M	SD	M	SD
Mirror	20.54 N=28	7.54	16.95 N=22	5.64
Plywood Back	18.50 N=20	6.02	14.50 N=28	5.10

Evaluation of significance was conducted by comparing high vs. low groups (groups 1 and 2 vs. 3 and 4). Results were significant as follows: $t(94) = 3.002$, $p < .01$.

Hypothesis 1(b) stated that subjects high in trait-cognitive anxiety will score higher in worry (pre-task) than those in the low trait-cognitive anxiety group. Means and standard deviations appear

in Table 3. Once again high scores are evidenced for the predicted group. A comparison of high vs. low groups (1 and 2 vs. 3 and 4) resulted in: $t(94) = 2.951$, $p < .01$.

Table 3

Means and Standard Deviations of Pre-Task Worry Scores

Objective Self-Awareness	Trait-Cognitive Anxiety			
	High		Low	
	M	SD	M	SD
Mirror	9.75 N=28	4.42	7.50 N=22	2.13
Plywood Back	10.05 N=20	3.93	8.25 N=28	2.41

Although this data is significant, tests for homogeneity of variances (Cochran's C and Bartlett-Box F) indicated that this assumption had not been met. Because this influences the interpretation of the data, the results of this hypothesis must be considered less conclusive.

2) Hypothesis 2, that those high in trait cognitive anxiety will evidence greater performance decrement than those low in such anxiety was not supported by the data. Table 4 presents means and standard deviations for each group.

Neither the omnibus $F(3, 94) = 1.922$, $p > .10$ nor the comparison of high vs. low groups (1 and 2 vs. 3 and 4) $t(94) = .0541$, $p > .90$ were significant.

Table 4

Means and Standard Deviations of Copying Task (Performance) Scores

Objective Self-Awareness	Trait-Cognitive Anxiety			
	High		Low	
	M	SD	M	SD
Mirror	470.72 N=28	74.87	466.36 N=22	52.58
Plywood Back	430.85 N=20	90.15	433.54 N=28	79.32

3) As evidenced in Table 4, those in the high cognitive anxiety/mirror group (group 1) had the highest mean performance score of all groups. Hypothesis 3 had predicted that this group would show the greatest performance decrement of the four groups. However, comparison of this group vs. the other three groups (1 vs. 2, 3, 4) did not yield significant results for this highest mean score: $t(94) = 1.605$, $p > .10$.

4) Hypothesis 4(a), those high in trait-cognitive anxiety, will evidence higher state-cognitive anxiety scores post-task (as well as pre-task) was supported by the data. Means and standard deviations are presented in Table 5. The higher mean scores for the high trait-cognitive anxiety group proved significant in the following comparison: $t(94) = 3.997$, $p < .01$.

Hypothesis 4(b) predicted that subjects high in trait-cognitive anxiety would score higher in worry post-task (as well as pre-task) than those low in trait-cognitive anxiety. Means and standard deviations are presented in Table 6. Although mean scores

Table 5

Means and Standard Deviations of Post-Task State-Cognitive Anxiety Scores

Objective Self-Awareness	Trait-Cognitive Anxiety			
	High		Low	
	M	SD	M	SD
Mirror	19.36 N=28	8.05	14.91 N=22	5.37
Plywood Back	19.35 N=20	6.40	13.25 N=28	5.41

Table 6

Means and Standard Deviations of Post-Task Worry Scores

Objective Self-Awareness	Trait-Cognitive Anxiety			
	High		Low	
	M	SD	M	SD
Mirror	10.04 N=28	4.41	7.05 N=22	1.46
Plywood Back	10.10 N=20	4.56	8.86 N=28	2.98

were higher for the predicted group and data from the comparison of high vs. low groups (groups 1 and 2 vs. 3 and 4) yielded significant results ($t(94) = 2.894$, $p < .01$), once again tests for homogeneity of variances did not support the homogeneity of variance assumption. Therefore results for this hypothesis must be considered less conclusive.

5) The fifth hypothesis consisted of three parts. The first, that subjects in the high trait-cognitive anxiety/mirror group (group 1) would evidence the highest mean state-cognitive anxiety scores (post-task), was only partially supported by the data. Table 5 indicates that this group mean was the highest. Despite the significance of the comparison result ($t(94) = 2.431$, $p < .05$), a one-way analysis of variance of the other three groups (groups 2, 3, 4) also revealed differences among these groups significant at $p < .05$. Thus it is not possible to make a definitive statement concerning the difference between the first group vs. the other three (1 vs. 2, 3, 4).

The second part of Hypothesis 5 predicted that the high trait-cognitive anxiety/mirror group would also evidence the highest worry scores (post-task) of all groups. Both the data presented in Table 6 and the results of a group 1 vs. 2, 3, 4 comparison ($t(94) = 1.704$, $p > .10$) do not support this hypothesis.

The final part of Hypothesis 5, that the mean change (predicted increase), pre- to post-task, in both state-cognitive anxiety and worry, will be greatest for the high trait-cognitive anxiety/mirror group (group 1) was not supported by the data.

6) It was predicted in Hypothesis 6 that those high in trait-cognitive anxiety will experience a greater amount of cognitive interference during the performance task than those low in such anxiety. Table 7 presents the means and standard deviations for this data. Comparisons of high vs. low groups (groups 1 and 2 vs. 3 and 4) yielded a significant result of $t(94) = 3.350$, $p < .01$.

Table 7

Means and Standard Deviations of Cognitive Interference Scores

Objective Self-Awareness	Trait-Cognitive Anxiety			
	High		Low	
	M	SD	M	SD
Mirror	22.61 N=28	5.53	19.77 N=22	4.26
Plywood Back	25.70 N=20	7.15	20.68 N=28	5.83

7) It was further predicted that subjects in the high trait-cognitive anxiety/mirror group (group 1) would experience the greatest amount of cognitive interference. In the 1 vs. 2, 3, 4 group comparison, this hypothesis was not supported.

8) The first part of Hypothesis 8 refers to statement #1 on the Post-Task Questionnaire (for both mirror and plywood conditions). It was predicted that subjects high in trait-cognitive anxiety would report noticing the presence of the mirror/plywood back more frequently than those low in trait-cognitive anxiety. Means and standard deviations are presented in Table 8. A comparison of high vs. low groups (groups 1 and 2 vs. 3 and 4) did not support this prediction: $t(94) = .713$, $p > .40$.

It was further predicted that those in the high trait-cognitive anxiety group would more often perceive the mirror/plywood back as a distraction during the experiment (this hypothesis refers to statement #2 on the Post-Task Questionnaire). Means and standard deviations are presented in Table 9. Once again comparison of high

Table 8

Means and Standard Deviations of Mirror/Plywood Presence Scores

Objective Self-Awareness	Trait-Cognitive Anxiety			
	High		Low	
	M	SD	M	SD
Mirror	3.39 N=28	.92	2.29 N=22	1.19
Plywood Back	1.95 N=20	1.19	2.10 N=28	1.20

Table 9

Means and Standard Deviations of Mirror/Plywood Distraction Scores

Objective Self-Awareness	Trait-Cognitive Anxiety			
	High		Low	
	M	SD	M	SD
Mirror	1.36 N=28	.68	1.23 N=22	.53
Plywood Back	1.15 N=20	.67	1.14 N=28	.45

vs. low groups (groups 1 and 2 vs. 3 and 4) did not yield significant results for this prediction: $t(94) = .572$, $p > .50$.

9) Subjects in the high trait-cognitive anxiety/mirror group (group 1) were expected to report noticing the presence of the mirror more frequently than the other groups (groups 2, 3, 4). Results of $t(94) = 4.259$, $p < .01$ were significant for this groups 1 vs. 2, 3, 4 comparison. However, a one-way analysis of variance of groups 2, 3, 4 indicated significant differences between those groups as well: $F(2, 67) = 4.085$, $p < .05$. Thus it is difficult to make a more definitive statement concerning the specified hypothesis.

In the second part of Hypothesis 9, that this same group (high trait-cognitive anxiety/mirror) would more often perceive the mirror to be a distraction, results were not significant: $t(94) = 1.40$, $p > .10$. This hypothesis was therefore not supported by the data.

The final statistical analysis specified in the proposal for this study was a comparison of the Worry-Emotionality Questionnaire and the state version of the CSAQ. In a sense, this was to be an exploratory analysis to investigate the similarity of the constructs involved, both believed to relate to types of state "anxiety."

Two items, one "worry" and one "emotionality" (as suggested by the authors of the measure) were added to the Worry-Emotionality Questionnaire to bring the total number of items to 12. The addition of the two items was for the purpose of increasing reliability in the analysis.

The two measures (pre- and post-task) were compared using a Pearson correlation (one-tailed) corrected for attenuation with the following formula:

$$r_c = \frac{r_{xy}}{\sqrt{r_{xx}}\ \sqrt{r_{yy}}}$$

where: r_{xy} = Pearson correlation

r_{xx} = reliability of x

r_{yy} = reliability of y

Results were as follows:

1) Worry-Emotionality Questionnaire and state CSAQ (pre-task) = $r_c = .615$.

2) Worry-Emotionality and state CSAQ (post-task) = $r_c = .647$.

Only about 35% of the variance is accounted for in both cases, suggesting that there is substantial difference between the two measures. A table of Pearson correlations for measures (with the exception of Cognitive Interference Questionnaire and Post-Task Questionnaire) used in this study are presented in the Appendix.

Post Hoc Analysis

In addition to the analysis performed to address each stated hypothesis using a 2 x 2 factorial design, a previously unstated exploratory analysis was conducted with a division of the subject sample into three trait-cognitive anxiety groups (thirds of the subject distribution): high, medium, and low. This was an attempt to conduct an analysis of performance task results using more

		Trait-Cognitive Anxiety		
		High	Medium	Low
Objective Self-Awareness	Mirror	1	2	3
	Plywood Back	4	5	6

homogeneous groups. Means and standard deviations for trait-cognitive anxiety scores are presented in the Appendix.

Table 10

Means and Standard Deviations of Copying Task (Performance) Scores Using Post Hoc Sample Distribution

Objective Self-Awareness	Trait-Cognitive Anxiety					
	High		Medium		Low	
	M	SD	M	SD	M	SD
Mirror	485.37 N=19	80.70	449.91 N=21	46.65	477.00 N=10	62.79
Plywood Back	439.07 N=14	85.21	416.27 N=11	96.54	436.09 N=23	77.75

Means and standard deviations for the performance task scores are presented in Table 10. Although the omnibus F was still not significant ($F(5, 92) = 1.766$, $p > .10$), results of a priori contrasts began to reveal some patterns in this data. Significant results were obtained for the following comparisons:

1) mirror vs. plywood groups (1, 2, 3 vs. 4, 5, 6): $p < .05$.
2) mirror vs. plywood in the high and low anxiety groups (1 and 3 vs. 4 and 6): $p < .05$.
3) high anxiety/mirror group vs. other groups (1 vs. 2-6): $p < .05$.

When doing similar contrasts using the 2 x 2 design, only the mirror vs. plywood groups comparison resulted in a finding of significance ($p < .05$).

In addition, a non-monotonic U-shaped pattern was noted - higher mean scores in high and low groups, with the lowest score in the middle or medium group. This pattern was evident in both experimental conditions, a situation considered not as likely to have occurred by chance. In summary, although the presence of a nonsignificant omnibus F suggests that any experimental effects may be weak, the combination of several significant group comparisons, as well as the presence of the U-shaped pattern in both experimental conditions, is worthy of note in this study.

Two other exploratory analyses were conducted using the original 2 x 2 design. In the first, an analysis of variance was conducted for pre-task state-cognitive anxiety and worry by class. Because subjects were drawn from both credit and noncredit classes and because there was reason to believe that one instructor's comments may have affected subject perceptions of their participation, it was believed that it would be important to conduct such analysis. The data revealed no significant differences between classes on either variable.

A second post hoc analysis was performed to explore the composition of the subject sample for the 2 x 2 design. As noted in Table 1, the omnibus F for trait-cognitive anxiety was significant at $p < .01$. A comparison of high vs. low groups specifically (groups 1 and 2 vs. 3 and 4) also evidenced significant difference: $t(94) = 13.01$, $p < .01$. However, the homogeneity of variance assumption was not met, introducing a note of caution in the interpretation of these results. These same trends were also found in the tests for the post hoc 3 x 2 design.

DISCUSSION

The focus of this study was the differential performance on a copying task of individuals scoring in a "high" or "low" range of trait-cognitive anxiety. It was further predicted that individuals "high" in trait anxiety would score higher in state-cognitive anxiety and in worry. It was assumed that a high level of cognitive anxiety would distract a subject from concentration on the task. Further, a high level of cognitive anxiety and worry should have interacted with a high level of objective self-awareness (the mirror condition) to produce even greater performance decrement.

As seen in Hypotheses 2 and 3, the predicted performance decrement for those high in cognitive anxiety was not supported by the data. In particular, the group of most interest in this study, the high cognitively anxious performing the task in front of the mirror (high objective self-awareness), not only did not suffer the greatest performance decrement, but actually achieved the highest mean performance source of the four groups. Although a comparison of high vs. low groups did not achieve statistical significance, a comparison of mirror vs. plywood (low objective self-awareness) groups was statistically significant at $p < .05$. As shown in Table 4, the mean performance scores of both mirror groups were higher than those of both plywood groups.

Several issues are involved in the interpretation of these results. It must be noted that the composition of the subject sample did not provide particularly homogeneous groupings nor as much statistical power for investigation of treatment effects as would have an upper-lower quartile selection. In this study, all individuals volunteering for the project were included as subjects and a median split divided high and low groups. The Appendix table showing trait-cognitive anxiety mean scores for the 2 x 2 design notes the range of trait-cognitive anxiety scores for each group. There is no numerical separation between the lowest score of the "high" group and the highest score of the "low" group. Future research attempting to divide a subject population on the basis of trait-CSAQ scores should plan for the screening of as large a group of potential subjects as possible. In this way, a division into upper and lower quartiles of the distribution (and possibly of the CSAQ cognitive scale, as well) would be a more likely occurrence.

In addition, and what is probably more important for interpretation of the findings, only four of the 100 subjects scored in the 29-35 range of the trait-CSAQ cognitive scale (this roughly corresponds to the upper quartile of the scale). Only ten subjects scored in the 25-35 point range. The implications of such numbers in terms of the absolute level of anxiety as measured by this scale may be crucial in attempting to explain subject performance. It appears that most subjects simply did not admit to a tendency to experience a great deal of cognitive anxiety. Whether this result reflected a genuine perception of lower anxiety

or a desire to appear less anxious to others cannot be interpreted from this data.

What level of cognitive anxiety is necessary for certain interactions to occur and performance decrement to be evidenced? This study predicted an interaction in some fashion between high cognitive anxiety (trait and state) and a high level of objective self-awareness to produce conditions leading to a worsening of performance on the task. The tendency to experience and the experiencing of a high number of cognitive intrusions (acting as distraction of attention) should have been exacerbated by a heightening of self-awareness. It is possible that those subjects in the high cognitive anxiety group as defined by this distribution median split were simply "not anxious enough." That is, a higher level of anxiety would have been necessary to lead to the sequence of reactions predicted.

The results of this study appear similar to those of Wicklund and Duval (1971), in which the presence of a mirror increased the number of words of German prose copied in a specified period of time. Leibling and Shaver (1973) obtained the same results for the copying of Swedish prose when subjects were performing in a low evaluation situation. In both of these studies, then, the presence of the mirror facilitated performance on simple tasks when evaluation apprehension was low.

Leibling and Shaver (1973) suggested a motivational explanation for this improvement in performance. If an attentional decrement (discussed by Wine, 1971) is compensated for by an arousal increment,

the result may be a situation in which an individual is simply "'trying harder'" (Wicklund and Duval, 1971, p. 304). In the present study, cognitive anxiety did not seem debilitatingly high; yet for the "high" group, enough of such anxiety may have been present for subjects to use the cues of that anxiety (and possibly of worry, as well) as a motivation to "try harder."

Cognitive interference was another variable investigated for contribution to performance decrement. Comparison of high vs. low groups for cognitive interference did reveal a statistically significant difference between these groups. Yet as in the case of trait-and state-cognitive anxiety, the level of interference (of task-irrelevant thoughts) may not have been great enough to result in more performance decrement. Nor did the presence of the mirror seem to appreciably heighten such interference.

In addition, the fact that the high anxiety/mirror group reported noticing the mirror but did not perceive it as a distraction from the task lends support to the hypothesis that absolute anxiety was not "high enough."

Although the high trait-cognitive anxiety groups did evidence greater worry scores (both pre- and post-task), the high cognitive anxiety/mirror group (group 1) did not score higher than the other three groups (pre- and post-task). [Post hoc investigation of the pre-task results for worry (group 1 vs. 2, 3, 4) did not yield statistically significant findings, $p > .13$.] This result suggests that the predicted interaction between high trait-cognitive anxiety and a high level of objective self-awareness leading to higher levels of worry, as well as of performance decrement, was not present.

As has been stated, in the present study every attempt was made to reduce evaluation apprehension. Thus, this study came to resemble both that of Wicklund and Duval (1971) and the low-evaluation condition of Leibling and Shaver (1973). Unfortunately this resemblance was unintentional. While efforts were made to keep externally-produced evaluation apprehension at a minimum, it was felt that high levels of cognitive anxiety and worry would introduce an internal sense of apprehension. This should have created concern for achieving a certain level of performance and anxiety regarding a possible negative outcome. This writer believes that individuals who experience high degrees of cognitive anxiety and worry will interpret many different situations as evaluative, including participation in an experiment and many sorts of performance tasks.

The concept of worry is a factor which may have an even more direct relationship to evaluation apprehension, per se. As noted in the Results section, the statistically significant data for pre- and post-task worry scores must be considered less conclusive. However, they still suggest the possibility that higher levels of trait- and state-cognitive anxiety will also imply higher levels of worry. As a construct, worry, with its emphasis of performance concerns and apprehension about negative consequences, thus seems to tap into the concept of evaluation apprehension. As mentioned in the Results section, worry-emotionality appears to an extent to be a different type of dimension than cognitive-somatic anxiety. Worry may actually be a special type of both evaluation anxiety (Wine, 1982) and in a broader sense, of cognitive anxiety.

Although the results of this study suggest that individuals experiencing higher levels of cognitive anxiety also experienced similar levels of worry, this may not always be the case. Cognitive anxiety deals with a number of types of cognitive intrusion. For some individuals, focus on anxiety in the form of cognitive intrusion may not be specifically related to concern about negative consequences or evaluation issues. Thus if the concept of evaluation apprehension may be closer in intent to worry than to cognitive anxiety, a similar study using worry as a focal construct might be worthwhile.

Another possibility for future study would be the deliberate introduction of different levels of evaluation apprehension within the cognitive anxiety-objective self-awareness paradigm. It is possible, as with the Leibling and Shaver (1973) and Paulus, Annis, and Risner (1978) studies, that evaluation apprehension as introduced external to the individual is a crucial mediating variable. A related question is whether all evaluation is seen as aversive. To what extent do individual differences in internal tendencies toward evaluation anxiety and perceptions of external situations as evaluative affect response to manipulation of high-low evaluation conditions in this type of study?

Although this study predicted an interaction between cognitive anxiety (and probably worry) and a state of high objective self-awareness to produce performance decrement, it is possible that other variables such as current life situation and mood state, not considered in this work or particularly emphasized, might be vital ingredients in such a response. This study was conducted during a four-week period in which most subjects had at least one set of midterm exams

scheduled. Such factors might have a certain influence on sensitivity to performance issues-either a temporary increase in apprehension or a sense of relief concerning the ending of the exam period and a possible increase in self-confidence if the individual did well.

The second variable mentioned, mood state, was the focus of an exploratory aspect of the study. Interest was chiefly in terms of a screening of some sort for depression or depression-like symptoms ("sadness" on the Emotion Wheel) which might provide an alternative explanation for performance decrement. Over 90 of the 100 subjects reported their mood prior to the copying task as being either "acceptance" or "anticipation." No further analysis was conducted. No attempt had been made to obtain a rating of affect intensity or post-task mood.

A more intensive investigation might be recommended for future research. According to Scheier and Carver (1977), self-focused attention heightens a person's awareness and responsivity to affect, regardless of the nature of the affect (positive or negative). Any effects on performance of mood/affect on this study are difficult to assess due in part to both a lack of intensity ratings and a lack of operational definitions of "acceptance" and "anticipation." Were these mood states positive or aversive and for which subjects? Just what is "acceptance," "anticipation"? Future work may be advised to investigate the use of a different instrument, along with ratings of intensity.

Another variable which may affect copying task performance is subjects' differential ability to print letters rapidly. Many subjects

used script even though they were instructed to print. All data sets were considered valid as long as each letter was distinguishable for purposes of observing correctness of letter, accent, and punctuation. It is possible that some individuals did attempt to follow the instructions faithfully. If printing were for any reason awkward for some subjects or more preferable for others, the speed of copying the prose may have been affected for this reason alone. The problem of subject adherence to these particular instructions is difficult within this paradigm. To reduce self-awareness from sources other than the mirror and to reduce evaluation apprehension, the experimenter was outside the room and could thus not monitor subjects' behavior. And from a practical standpoint, it was simply not possible to exclude all data sets in which a subject had written rather than printed the Swedish prose. Nevertheless, this individual difference variable should be considered in any research involving a copying task.

The results of the post hoc exploratory analysis of the performance data lend support to the importance of creating more homogeneous groupings. When the subject sample was divided into three groupings of trait-cognitive anxiety level (high, medium, and low), a greater number of the same a priori comparisons evidenced statistically significant results.

The results of this exploratory analysis also reveal an interesting pattern which, while again not supporting the hypothesis of performance decrement, is nevertheless worth noting. A non-monotonic, U-shaped pattern was evidenced for both mirror and plywood experimental conditions. High and low groups achieved mean scores

in each case higher than the "Medium" group. And those higher scores were more so in the mirror than in the plywood condition. As noted in the Results section, comparisons of all mirror vs. plywood groups and high vs. low groups in the mirror condition proved statistically significant.

Interpretation of higher performance scores in mirror as opposed to plywood conditions has been suggested previously in this section. It is felt that such interpretations apply equally to this 3 x 2 design.

Possible explanations for the U-shaped scoring pattern and a statistically significant difference between high and low groups in the mirror condition are more problematic and suggested interpretations not readily available in the self-awareness literature. It is possible that individuals in the low group, not experiencing much distraction, were able to focus well on the task and achieve a higher level of performance. In the high cognitive anxiety group, there may have been a sufficient amount of internal cues of anxiety to provide some additional motivation to "try harder," also resulting in higher performance scores. For this group, the condition of high objective self-awareness may have then interacted with the higher level of cognitive anxiety to provide stronger anxiety cues and an even greater instance of "trying harder." Thus, in the mirror condition, the higher cognitive anxiety group evidenced even higher scores than the low anxiety group.

In the case of the medium group, there may have been "just enough" anxiety experienced to not allow these individuals to be in the same internal circumstances as the low group, yet "not enough" anxiety

felt to provide that additional motivation. The condition of high objective self-awareness produced a higher performance mean in the mirror as opposed to plywood condition, yet scores in both conditions remained depressed below those of both high and low groups.

Although such a non-monotonic pattern is not often seen in both experimental conditions by chance, it must be noted that the omnibus F for performance task for this design did not achieve statistical significance. Treatment effects, if existing, are most probably weak. The importance of this exploratory analysis may rest more in the changes evidenced when groups were made more homogeneous, introducing more statistical power into the analysis.

Results of this study lend support to the conclusion that self-attention is not necessary phenomenologically aversive (Carver & Scheier, 1978). This work was an attempt to investigate one possible variable which might lead to an aversive reaction: the interaction of a high level of objective self-awareness with a high level of cognitive anxiety. It was hypothesized that such an interaction might produce an internal state very similar to that of evaluation apprehension. It was further predicted that such an aversive reaction would be evidenced in an increased number and/or intensity of cognitive intrusions, worry, and cognitive interference, leading to increased distraction of attention and performance decrement.

In a clinical setting, all of these variables will be involved at various times: perceptions of possible evaluation by the therapist on the part of the client; increased self-awareness as the client is asked to become more introspective and possibly to focus on experiences of anxiety, fear, and other emotion; the use of audio

and video tapes, note-taking (the former often the case when the therapist is in training); and certainly high levels of cognitive anxiety and worry for many clients at some points at least.

As this anxiety increases, what might happen to the client's ability to focus and concentrate on any point of thought and discussion? The performance task in this study was a simple one, but demanding of an individual's ability to concentrate and focus her energy on such a task for a given period of time. Client anxiety levels within a clinical setting will often be far higher than those of high group in this study. Would the level of anxiety in the clinical setting be the level "high enough" to trigger the mentioned interaction? In addition, the concept of "clinical" as opposed to "normal" anxiety may play a role in the clinical setting. Clients entering therapy with anxiety-related disorders or unusually high levels of anxiety (especially cognitive; often high levels of both somatic and cognitive) may experience such interaction on a continual basis during therapeutic intervention.

In conclusion, while this study generally supported the prediction that a higher level of trait-cognitive anxiety would suggest higher levels of state-cognitive anxiety, worry, and cognitive interference during a simple performance task, the data failed to support the focal hypothesis: that these higher levels of anxiety and worry would interact with a high level of objective self-awareness to produce the greatest observable performance decrement among all groups.

The most prominent explanation for the failure to observe statistically significant differences in task performance appears to

be the lack of a "high enough" level of cognitive anxiety among subjects to produce the predicted interaction. Also, as noted, the concept of evaluation apprehension is an important factor in performance decrement in other objective self-awareness research. It was predicted that the above mentioned interaction would produce an internal state similar to that of evaluation apprehension, providing a mechanism by which performance level should decrease. Yet because cognitive anxiety, consisting of a variety of cognitive intrusions, is a broad concept, individuals experiencing this type of anxiety may or may not experience it in more directly "evaluative" terms.

Mood state is a third variable which may have implications for task performance. While an effort was made to assess each subject's pre-task mood, these "moods" (as listed on the Emotion Wheel) were not well-defined, nor was any attempt made to assess intensity of mood or post-task change.

Any attempt to replicate this study should include the following changes: first, the screening of a large enough group of potential subjects to allow division of "high" and "low" trait-cognitive anxiety groups by quartiles (preferably including a high level of "absolute" anxiety on the CSAQ scale, itself). As noted in the post hoc exploratory analysis, more homogeneous groupings of subjects will create more statistical power for analysis. And by creating a more genuinely "high" anxiety group, the probability of the predicted interaction leading to performance task differences should increase.

Second, a more thorough investigation of subject mood or affect would help to focus on alternative explanations for any observed

performance decrement. Clear, operationally-defined terms and the addition of affect intensity ratings and post-task assessment should be included.

Third, an additional analysis might be considered, utilizing state-cognitive anxiety and worry scores. This suggestion follows the same reasoning as that of intensity of mood state. A subject's present mood and its intensity may have a more direct bearing upon performance than a more general tendency toward a given experience (although it would still be predicted that a high level of trait-cognitive anxiety would suggest a higher level of state-cognitive anxiety and worry, as well).

Finally, a change in design of this study, allowing for inclusion of high and low levels of evaluation apprehension, might also help to more specifically focus on a source of performance difference. Evaluation levels could be produced by alteration of instructions to the subject, suggesting a much greater evaluative component to task performance.

APPENDICES

APPENDIX A

ADDITIONAL TABLES

APPENDIX A

ADDITIONAL TABLES

Reliabilities of Measures

	N=100	N=98
Trait-CSAQ	.807	.815
State-CSAQ (pre-task)	.866	.865
Worry-Emotionality (pre-task)	.887	.893
Cognitive Interference Questionnaire*	.779	.778
State-CSAQ (post-task)	.887	.887
Worry-Emotionality (post-task)	.870	.873
Post-Task Questionnaire	.416	.422

*With item #11 deleted.

Pearson Correlations of Selected Measures*

	Trait-CSAQ	Pre-task State-CSAQ	Pre-task WE	Post-task State-CSAQ	Post-task WE
Trait-CSAQ	1.000	.460	.443	.470	.391
State-CSAQ (pre-task)	.459	1.000	.541	.764	.553
Worry-Emotionality (pre-task)	.443	.541	1.000	.339	.751
State-CSAQ (post-task)	.470	.764	.339	1.000	.572
Worry-Emotionality (post-task)	.391	.553	.751	.572	1.000

*N=98.

Means and Standard Deviations of Trait-
Cognitive Anxiety Scores for Exploratory Analysis

Objective Self-Awarnesss	Trait-Cognitive Anxiety					
	High		Medium		Low	
	M	SD	M	SD	M	SD
Mirror	24.32 N=19	3.42	17.95 N=21	1.40	13.00 N=10	2.71
Plywood Back	25.00 N=14	3.76	18.00 N=11	1.67	13.48 N=23	1.78

Scoring ranges were as follows:

High anxiety between 21-35.

Medium anxiety between 16-20.

Low anxiety between 8-16.

Means and Standard Deviations of Trait-Cognitive Anxiety Scores for 2 x 2 Design

Objective Self-Awareness	Trait-Cognitive Anxiety			
	High		Low	
	M	SD	M	SD
Mirror	22.71 N=28	3.68	15.14 N=22	2.71
Plywood Back	23.30 N=20	4.42	14.00 N=28	1.98

Note. "High" anxiety scores ranged between 18-35.

"Low" anxiety scores ranged between 8-18.

Performance Raw Scores by Group*

Group 1	High Trait Cognitive Anxiety/Mirror		N=28
311	617	400	419
542	550	492	510
458	483	384	510
530	426	483	371
578	427	361	607
432	493	489	415
510	492	392	498

Group 2	High Trait Cognitive Anxiety/Plywood Back		N=22**
521	419	377	374
452	710**	238	383
501	431	540	517
366	404	703**	532
566	374	489	
243	452	438	

Group 3	Low Trait Cognitive Anxiety/Mirror		N=22
497	534	489	438
422	470	472	532
335	468	413	601
507	443	522	475
476	391	406	
446	454	414	

Group 4	Low Trait Cognitive Anxiety/Plywood Back		N=28
511	463	281	401
476	454	409	381
374	328	510	315
562	416	334	650
417	492	458	485
454	510	358	374
469	399	431	427

*2 x 2 design.

Includes "outlyers" indicated by.

APPENDIX B

INSTRUMENTS

APPENDIX B

INSTRUMENTS

(attached to CSAQ)

If you have a reading, speaking, and/or writing knowledge of Swedish, Norwegian, or Danish, do not go on to complete this questionnaire. Please return this copy to the experimenter.

CSAQ

Please rate the degree to which you generally or typically experience the following symptoms when you are feeling anxious. Use the following scale:

1	2	3	4	5
Not at all				Very much so

_____1. I find it difficult to concentrate because of uncontrollable thoughts.

_____2. I worry too much over something that doesn't really matter.

_____3. My heart beats faster.

_____4. I feel jittery in my body.

_____5. I imagine terrifying scenes.

_____6. I feel like I am losing out on things because I can't make up my mind soon enough.

_____7. I can't keep anxiety provoking pictures out of my mind.

_____8. I get diarrhea.

_____9. I become immobilized.

_____10. Some unimportant thought runs through my mind and bothers me.

_____11. I feel tense in my stomach.

_____12. I can't keep anxiety provoking thoughts out of my mind.

_____13. I nervously pace.

_____14. I perspire.

(attached to the first pre-task questionnaire the subject received)

As we have mentioned, in this pilot study, we need to know to the extent possible just how similar subjects are on several dimensions. Therefore, in addition to the copying tasks, we will be asking you to complete a series of self-report measures.

Please complete the questionnaire attached to this sheet. When you have finished, slide it under the door and wait for the next measure to be passed in to you.

Follow this same procedure for all measures.

CSAQ-STATE

Please circle one number to the left of each statement to indicate how you feel right now, that is, at this moment. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

Not at all			Somewhat			Very much so	
1	2	3	4	5	6	7	1. My mind feels calm.
1	2	3	4	5	6	7	2. My muscles are tense.
1	2	3	4	5	6	7	3. I am jittery.
1	2	3	4	5	6	7	4. My mind is at peace.
1	2	3	4	5	6	7	5. I feel distracted by thoughts.
1	2	3	4	5	6	7	6. My heartbeat is calm and regular.
1	2	3	4	5	6	7	7. I am worried.
1	2	3	4	5	6	7	8. My body feels relaxed.
1	2	3	4	5	6	7	9. My breathing is calm and regular.
1	2	3	4	5	6	7	10. I am having pleasant thoughts and images.
1	2	3	4	5	6	7	11. My body feels restless.
1	2	3	4	5	6	7	12. I am presently worrying over possible misfortunes.

W-E

Directions: To the left of each of the following statements, indicate your feelings, attitudes, or thoughts as they are right now in relation to this study. Use the following numerical scale.

1. The statement does not describe my present condition.
2. The condition is barely noticeable.
3. The condition is moderate.
4. The condition is strong.
5. The condition is very strong; the statement describes my present condition very well.

_____I feel my heart beating fast.

_____I feel regretful.

_____I am so tense that my stomach is upset.

_____I am concerned about the possibility of doing poorly.

_____I have an uneasy, upset feeling.

_____I feel that others will be disappointed in me.

_____I am nervous.

_____I feel I may not do as well in this study as I could.

_____I feel panicky.

_____I do not feel very confident about my performance in this study.

_____I feel high strung.

_____I am afraid that other subjects will be able to do a better job in this study.

(attached to the first post-task questionnaire given)

Now we need some additional information concerning the similarities of the subjects participating in this study. Once again, please complete the attached questionnaire. When you have finished, slide it under the door and wait for the next measure to be passed in to you. Follow this same procedure for all post-task instruments.

CIQ

I. We are interested in learning about the kinds of thoughts that go through people's heads while they are working on a task. The following is a list of thoughts some of which you might have had while doing the task on which you have just worked. Please indicate approximately how often each thought occurred to you while working on it placing the appropriate number in the blank provided to the left of each question.

Example: 1 = never

2 = once

3 = a few times

4 = often

5 = very often

_____1. I thought about how poorly I was doing.
_____2. I wondered what the experimenter would think of me.
_____3. I thought about how I should work more carefully.
_____4. I thought about how much time I had left.
_____5. I thought about how others have done on this task.
_____6. I thought about the difficulty of the task.
_____7. I thought about my level of ability.
_____8. I thought about the purpose of the experiment.
_____9. I thought about how I would feel if I were told how I performed.
_____10. I thought about how often I got confused.
_____11. I thought about things completely unrelated to the experiment.

II. Please circle the number of the following scale which best represents the degree to which you felt your mind wandered during the task you have just completed.

Not at all 1 : 2 : 3 : 4 : 5 : 6 : 7 Very much

Post-Task Questionnaire-M

(Given to the subjects in the "mirror" condition)

Post-Task Questionnaire-M

Please answer the following questions concerning your experience during this experiment. Use the following numerical scale.

1. This statement does not describe my experience.
2. This statement describes my experience only slightly.
3. This statement describes my experience somewhat.
4. This statement describes my experience very well.

_____1. I was aware of the presence of the mirror.

_____2. I found that the presence of the mirror distracted me from concentrating on the tasks.

_____3. I was aware of the presence of the experimenter outside the room.

_____4. I found that the passing of materials under the door distracted me from concentrating on the tasks.

Please answer "yes" or "no" to the following questions.

_____Yes _____No If currently enrolled in PSY 160, you have also taken PSY 170.

_____Yes _____No If currently enrolled in PSY 170, you have also taken PSY 160.

Post-Task Questionnaire-P

(given to the subjects in the "no mirror" (i.e., plywood back facing subject) condition)

Post-Task Questionnaire-P

Please answer the following questions concerning your experience during this experiment. Use the following numerical scale.

1. This statement does not describe my experience.
2. This statement describes my experience only slightly.
3. This statement describes my experience somewhat.
4. This statement describes my experience very well.

_____1. I was aware of the presence of the plywood board.

_____2. I found that the presence of the plywood board distracted me from concentrating on the tasks.

_____3. I was aware of the presence of the experimenter outside the room.

_____4. I found that the passing of materials under the door distracted me from concentrating on the tasks.

Please answer "yes" or "no" to the following questions.

_____Yes _____No If currently enrolled in PSY 160, you have also taken PSY 170.

_____Yes _____No If currently enrolled in PSY 170, you have also taken PSY 160.

APPENDIX C

SUBJECT DEBRIEFING

APPENDIX C

SUBJECT DEBRIEFING

Written debriefing mailed to all subjects.

The experiment in which you participated was actually an investigation of performance differences between subjects "high" in cognitive anxiety vs. those subjects "low" in such anxiety under conditions of "high" objective self-awareness.

Cognitive anxiety was initially measured during the screening phase of the study. Half of the questions on this first questionnaire determined each individual's score in this type of anxiety.

Cognitive anxiety refers to the tendency of an individual, when anxious, to experience various kinds of cognitive intrusions - thoughts and images - which often distract the attention of the individual away from the task at hand. For instance: you are giving a speech in front of a group and suddenly experience the thought: what if I can't remember what I'm going to say next? This is an example of cognitive anxiety. Individuals experiencing a great deal of cognitive anxiety tend to be more self-focused in these thoughts and images. Somatic anxiety (the physical manifestations of the anxiety experience) scores were recorded but not used in the experiment itself.

Objective self-awareness refers to the tendency of an individual to see him or herself as an object in the world. The mirror used in this experiment was a way of manipulating this experience, increasing a subject's objective self-awareness, making it much more likely that she would become more self-focused. Often when individuals become highly self-aware, they also focus on any intra-self discrepancies existing at the moment, something (s) that they are dissatisfied with about themselves. Those subjects who performed the experiment in front of the mirror's plywood backing were in a state of <u>low</u> objective self-awareness, not being reminded of themselves as objects in the world and thus not becoming more self-focused. Any cognitive anxiety and/or tendency at that moment to be highly self-focused would not be heightened by this condition.

Many situations will produce an increase in objective self-awareness, including the experience of being a subject in an experiment and any concern the subject may have that he or she is being (or is about to be) evaluated. For this reason, in this experiment we attempted to <u>reduce</u> all other sources of objective self-awareness aside from the mirror. This would make it possible to more accurately isolate the mirror as the chief source of such self-awareness in this study.

Thus we set up the experiment as if it were a pilot study in which subjects would be <u>helping</u> future research efforts in an area which

was not personally threatening to any subject (i.e., overall, reducing evaluation apprehension). Also, the experimenter was not in the room with the subject, once again reducing the possibility of evaluation apprehension as well as reducing distraction for the subject. The mirror was not mentioned until the Post-Task Questionnaire-M to avoid directing the subjects' attention to it in a more artificial way.

For those subjects who scored in the "high" range of cognitive anxiety on the initial screening measure, it was hypothesized that because of the increased tendency to be cognitively distracted and most probably self-focused, such tendencies would be greatly heightened in a state of "high" objective self-awareness (mirror). The chief hypothesis of this study is that subjects in this group (high cognitive anxiety/high objective self-awareness) will do less well on the copying task than subjects in any of the other three groups.

In addition to performance scores on the Swedish copying task (# of correct letters and marks of punctuation and accent), other post-task measures investigated the degree to which cognitive interference and various other types of distraction were experienced during the experiment. In addition, two measures assessing the experience of cognitive anxiety and worry <u>at that moment</u> (state measures) were administered both before and after the copying task to investigate possible changes in the level of anxiety and worry during that period. Somatic anxiety and emotionality (similar to somatic anxiety) scores were once again recorded but not used in the study for analysis.

The recording of the subjects' predominant mood involved an exploratory aspect of the study. Because such a mood as a "depressed" feeling or sadness may result in a decrease of energy output, such a mood might be an alternative explanation for a poorer performance on the copying task, and such information is thus important for an overall discussion of the study results.

This study should be completed over the course of the next two terms. If you would like an abstract of the study results, please either give me an SASE this term and I will mail you a copy as soon as the study is completed or contact me c/o the Department of Psychology, 135 Snyder Hall next Fall.

If you have any additional questions concerning the study and/or your participation, please contact me at 353-5193, 19 Snyder, or by mail c/o 135 Snyder.

Ann M. Isenberg

APPENDIX D

RATIONALES AND INSTRUCTIONS TO SUBJECTS

APPENDIX D

RATIONALES AND INSTRUCTIONS TO SUBJECTS

Rationale given to subjects prior to administration of the trait-CSAQ.

> We are conducting a pilot study for a project in which subjects will copy written material of graded difficulty. Before we begin the study, we need to know just how similar subjects will be on certain variables.
>
> Therefore, we are asking you to take the next few minutes to complete first the consent form, then the questionnaire being distributed.

Rationale given to subjects upon arrival for the second (copying task) phase of the study.

> As we mentioned before, this is a pilot study for a project in which subjects will copy written materials of graded difficulty.
>
> Before we can perform any study on the effects of varying levels of difficulty, we must establish a scale to measure the difficulty of written material. This is what you will be helping us do in this pilot study.
>
> By measuring how much of a given written material a random sample of people can copy accurately, we can not only rank order different materials by difficulty, but we can see how much harder one passage is to copy than another. You will be copying material of one level of difficulty and other subjects will be copying material of other levels.
>
> Because this is a study to establish a scale of measurement, we need to find out just how similar participating individuals are in certain ways. Therefore, we will also be asking you to complete some questionnaires before and after the copying task, itself.

APPENDIX E

CONSENT FORM

Instructions for experimental procedure verbally given to each subject before the start of the experiment.

To prevent distraction, I will be outside the room throughout the experiment. I will be giving you the first measure as you enter the room. Please sit at the desk to your left. You will find pencils and paper for the copying task on the desk. When you finish the first questionnaire, slip it under the door and I will slide the next measure in to you. (Experimenter demonstrates). Follow this procedure for the first three measures. All instructions for completing these measures also appear on the instruments, themselves.

After the third measure, I will slide the copying task under the door. Please read the instructions carefully. When you are finished and are ready to begin, knock twice on the door (Experimenter demonstrates). When you have two knocks in return, you may begin copying the Swedish prose, by printing, on the paper you will find on the desk. When you hear a second double-knock (Experimenter demonstrates), stop copying immediately and slide all materials under the door. I will then slide the next measures in to you.

Following the copying task, there will be four short questionnaires for you to complete. Please follow the same procedure of sliding the completed measures under the door. After the fourth questionnaire is completed, I will come into the room and you will be able to ask any questions you might have.

APPENDIX E

CONSENT FORM

This study involves two stages. You have volunteered for this first phase in which we will ask you to complete a questionnaire after you have read and signed this form. If you have reading, writing, or speaking knowledge of Norwegian, Swedish, or Danish, you will not be eligible to participate. In such a case, please return this form to the experimenter immediately.

In this study, it is necessary for us to know how similar subjects are on a number of variables. During this first phase, you will be providing us with some of that information. We would like you to answer the statements on the questionnaire as truthfully as possible. All information provided during this study will be coded to protect subject confidentiality. This first phase of the project will last between 15 and 30 minutes. You may ask the experimenter any questions you like and you are free to terminate your involvement in the study at any point.

We will be selecting a number of you to return to participate in the second stage of this project, the copying of written materials. At this point, we do not know how many subjects this will involve. Therefore, once again we emphasize that we would like as truthful a sample as possible when completing this first questionnaire. Those subjects selected to participate in the second phase of the study will be recontacted by the experimenter and asked to return to a specified location at a mutually arranged time. The second phase of the study will involve the copying task, itself, as well as a series of

self-report questionnaires before and after the task which will provide additional information concerning similarity of the subject sample.

The second stage of the project will last from 30-45 minutes. A written explanation of the details of the study will be provided to all subjects as soon as project data collection is completed. At that time, subjects may also arrange to meet with an experimenter to ask for any further information desired. Once again, all information you provide will be coded to maintain confidentiality. You may also ask the experimenter any questions you might have and you are free to terminate your involvement with the project at any time during this second phase.

You will receive credit for all participation in this project if outlined by your course instructor.

Please read this information carefully and feel free to ask the experimenter any questions you might have. At this point, we are asking you to provide your written consent to participate in the first phase of the study (completing the initial questionnaire) and willingness to participate in the second phase (copying task and additional questionnaires) should be recontacted. Once you have read this form carefully, please indicate your consent to participate by signing and dating this form on the lines immediately below.

_____ _____

Volunteer's signature Date

_____ _____

Experimenter's signature Date

APPENDIX F

EMOTION WHEEL

APPENDIX F

EMOTION WHEEL

Note on the construction of the "Emotion Wheel"

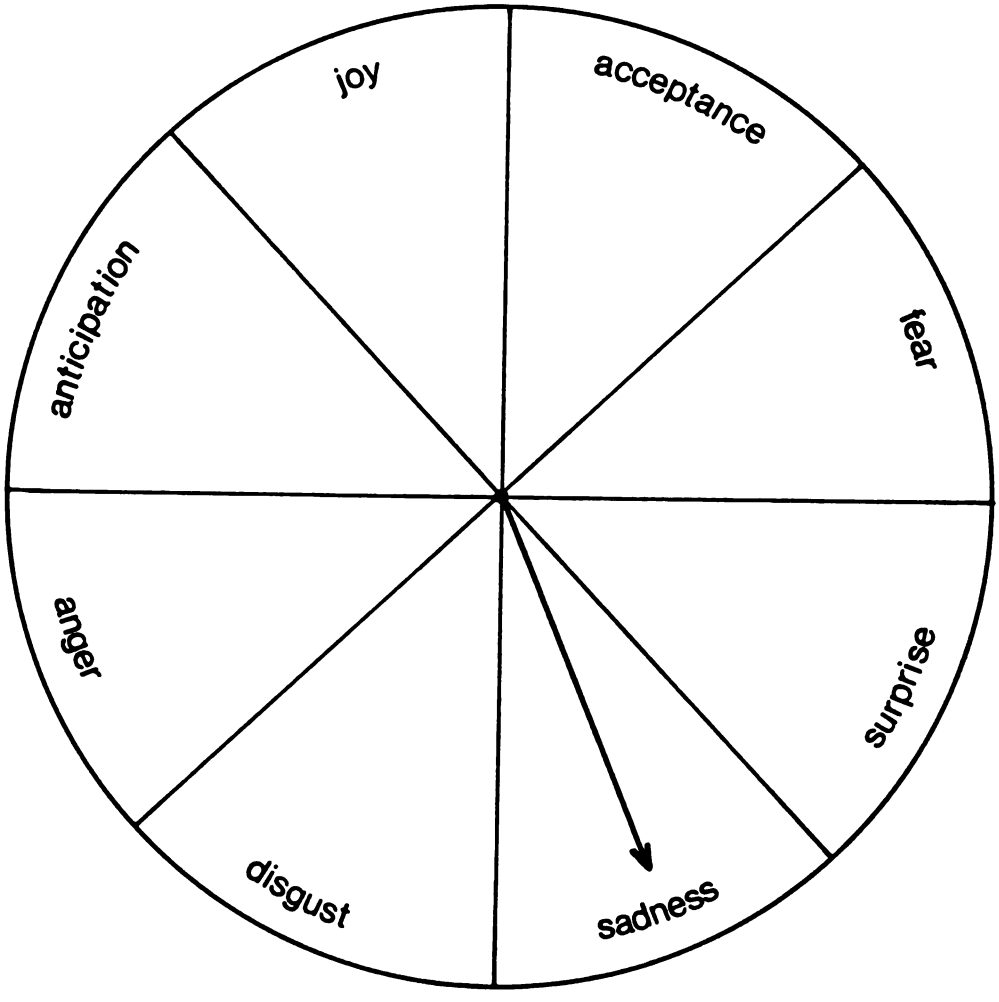
The "Emotion Wheel" was drawn on a square of posterboard measuring 10" x 11". A movable pointer of a contrasting color was then attached to the "Wheel's" center (refer to the artist's illustration of the instrument).

(attached to the "Emotion Wheel")

Please indicate by means of the pointer what you feel your predominant mood to be AT THIS MOMENT.

When you have set the pointer, please pass the instrument under the door and wait for the next task.

Emotion Wheel



APPENDIX G

COPYING TASK

APPENDIX G

COPYING TASK

(instructions for copying task)

Now we are going to ask you to copy a sample of some written material.

Read the instructions carefully. When you have finished, KNOCK TWICE on the door, then return to your seat.

When you hear TWO KNOCKS in return, begin copying the material.

Please PRINT all letters as they appear and INCLUDE punctuation and ALL marks of accent (i.e., $\ddot{o}$, etc., above letters).

When you hear TWO KNOCKS once again, STOP and slip the copying task and your copy under the door.

Return to your seat and wait for the next questionnaire to be passed in to you.

Brödsäden på landet mellan Göteborg och Stockholm och enligt vad man sade mig nästan överallt i Sverige är råg, havre, ärter, bönor och litet korn. Det finns litet vete i Skåne och även i trakten av Uppsala. Denna plats var Odens residens och den forna huvudstaden i Skandinavien, och i dess närhet finns det många spår av odling och rester av gången glans. Jordbrukets tillstånd i Sverige är mycket underlägset de flesta andra länders. Fårorna blir varken vältade eller sladdade eller regelbundet harvade. Jorden plöjs upp högst avsevärt åt mitten av tegen, medan bägge sidorna berövas mer och mer av den, så att kanterna blir nästan nakna berget. Deras svängda form i bägge ändar hindrar vattnet att passera, medan dräneringen i ett sådant klimat borde vara ett av de förnämsta önskemålen. Den obrukade mark som skall tagas i anspråk för odling rensas från skog medelst eld, som ibland sprider sig alltför långt och kring den odlade biten lämnar en bred och föga inbjudande ödemark, som är ogästvänlig mot all vegetation. Förstöringen av skogen är otvivelaktigt orsaken till att vissa områden inte längre producerar samma sädesslag eller samma kvantiteter som tidigare. Spår efter åkrar, som nu är övervuxna med ljung eller mossa påträffas överallt på hedar och bergssluttningar i Skottland, Wales och norra England och likaså i Sverige, Norge och på Island. Det föreföll anmärkningsvärt, att

de vildaste ställen vi passerade på vägen från Hälsingborg till Göteborg och därifrån till huvudstaden inte var bevuxna med ljung utan med mossa eller ett slags grovt gräs. Den säd och det hö som finns i Sverige brukar hässjas på träramar, som är resta flera fot över marken. Sädeskärvar som sättes upp för att torka på åkrarna är inte ställda i två parallella rader, som lutar sig mot och möter varandra i toppen med två kärvar som hatt eller huva, utan i en rundel och täckta med en hattkärve, som breds ut för att skydda mot regn.

Herdarna i Sverige liksom på Island har lurar av björk. Två urholkade bitar av björkträ läggs tätt tillsammans och bindes om med näver av samma trädslag, så att det bildas ett runt rör. Det ljud man åstadkommer med denna lur är gällt och vilt men inte obehagligt. Får och kor samlas på vissa tider och ställen med hjälp av dessa lockrop. Det är på samma sätt korna kallas samman av herdarna i Alperna. Vad jag såg av södra Sverige var ingenting särskilt lockande för ögat, men eftersom landskapet överallt är angenämt omväxlande och ur andra synpunkter erbjuder mycket nytt för iakttagaren, är det intressant för en resande. Hela Sveriges paradis är Skåne, där många av adeln och de förmögna slår sig ned om sommaren. Man möter där vackra alléer och andra förskönande inslag. Men eftersom det inte är min avsikt att beskriva de södra

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