

THE UNIVERSITY OF MANITOBA

SUBJECT BEHAVIOUR IN THE LABORATORY: OBJECTIVE
SELF-AWARENESS OR EVALUATION APPREHENSION?

by

BARRY SPINNER

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE
OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF PSYCHOLOGY

WINNIPEG

JUNE 1979



SUBJECT BEHAVIOUR IN THE LABORATORY: OBJECTIVE
SELF-AWARENESS OR EVALUATION APPREHENSION?

BY

BARRY SPINNER

A dissertation submitted to the Faculty of Graduate Studies of
the University of Manitoba in partial fulfillment of the requirements
of the degree of

DOCTOR OF PHILOSOPHY

©^v1979

Permission has been granted to the LIBRARY OF THE UNIVER-
SITY OF MANITOBA to lend or sell copies of this dissertation, to
the NATIONAL LIBRARY OF CANADA to microfilm this
dissertation and to lend or sell copies of the film, and UNIVERSITY
MICROFILMS to publish an abstract of this dissertation.

The author reserves other publication rights, and neither the
dissertation nor extensive extracts from it may be printed or other-
wise reproduced without the author's written permission.

Abstract

Rosenberg (1965; 1969) has proposed that subjects in psychological experiments are motivated by evaluation apprehension, behaving so as to receive a positive evaluation from the experimenter. Although conceptual problems have been identified with the construct, numerous authors have argued that evaluation apprehension is the predominant motive in the laboratory. However, a literature review does not support the hypothesis that the behavioral effects of evaluation apprehension are mediated by the expectation of, and anxiety over the experimenter's evaluation. Examination of the methods used to manipulate evaluation apprehension suggests that the phenomenon may be reinterpreted within the framework of the theory of objective self-awareness. The purpose of the present research was to investigate this relationship by administering instructions typical of research on evaluation apprehension, and observing their effect on measures of objective self-awareness completed by 160 male and female subjects.

Results provided general support for the hypothesis that instructions designed to arouse evaluation apprehension produce a state of objective self-awareness accompanied by a negative discrepancy (i.e., the expectation of failure). It was suggested that the behavioural effects typically associated with evaluation apprehension may be attributed to the self-evaluation process accompanying states of objective self-awareness, rather than the expectation of and arousal over the experimenter's evaluation. The implications for improving the precision and accuracy of psychological data were discussed.

ACKNOWLEDGEMENTS

Several people deserve my thanks for their help in bringing this dissertation and my career as a graduate student to a conclusion. My dissertation committee members, Dr. E.D. Boldt, Dr. D. Dyck, Dr. D. Perlman, and Dr. R. Rosnow provided valuable guidance and support throughout the project. Special thanks and appreciation are due to Dr. John G. Adair, who served as committee chairman and graduate advisor. His learned advice and his friendship have helped make the past four years a valued and enjoyable experience.

Thanks are also due to Terry Dushenko and Don Salmon for their help in conducting the study, and to Bernie Klippenstein and Kim Routledge for their help in scoring the data.

Finally, my appreciation goes out to the many friends who provided emotional support when it was needed. In particular, my wife Elaine, whose love and unlimited understanding has supported me through many years of school, deserves more thanks than I can express.

TABLE OF CONTENTS

| | PAGE |
|---|------|
| ABSTRACT | i |
| ACKNOWLEDGEMENTS | ii |
| LIST OF TABLES | v |
| CHAPTER | |
| I INTRODUCTION | 1 |
| The Theory of Objective Self-Awareness | 3 |
| Evaluation Apprehension or Objective Self-Awareness | 4 |
| II METHOD | 10 |
| Subjects and Experimenters | 10 |
| Design and Experimental Setting | 10 |
| Procedure | 11 |
| Post-Experimental Questionnaire | 14 |
| III RESULTS | 16 |
| Effectiveness of the Manipulations | 16 |
| Frequency of Personal Pronoun Use | 18 |
| Speed of Performance | 22 |
| Other Results | 24 |
| Validity of the Personal Pronoun Measure | 26 |
| IV DISCUSSION | 28 |
| Evaluation Apprehension and Self-Awareness | 28 |
| The Mirror Effect | 30 |

TABLE OF CONTENTS (CONTINUED)

| CHAPTER | | PAGE |
|-------------|---------------------------------------|------|
| IV | The Cueing Effect | 32 |
| | Implications for Research | 32 |
| | Summary and Conclusions | 34 |
| REFERENCES | | 36 |
| FOOTNOTES | | 43 |
| APPENDIX A: | Literature Review | 44 |
| APPENDIX B: | Instructions Major Study | 77 |
| APPENDIX C: | Post-Experimental Questionnaire | 81 |
| APPENDIX D: | Statistical Tables | 86 |
| APPENDIX E: | Validation Study | 112 |
| APPENDIX F: | Materials - Validation Study | 116 |
| APPENDIX G: | Other Results | 127 |

LIST OF TABLES

| TABLE | | PAGE |
|-------|---|------|
| 1 | Hypothesized state of self-awareness, nature of discrepancy and frequency of personal pronoun use as a function of mirror presence, evaluation apprehension and cue presence .. | 8 |
| 2 | Mean Reported expected and achieved success as a function of presence of cues and sex of subject | 17 |
| 3 | Mean frequency of personal pronoun use and a priori contrasts as a function of mirror presence, evaluation apprehension, cue presence and sex of subject | 19 |
| 4 | Mean frequency of personal pronoun use per block of 20 trials as a function of evaluation apprehension and cue presence when the mirror was absent | 22 |
| 5 | Mean self-reported feelings of evaluation and concern over performance for the interaction of evaluation apprehension, cue presence and sex of subject | 25 |
| 6 | Summary table for analysis of variance on personal pronoun measure and for MANOVA on blocks of trials | 87 |
| 7 | Summary table for analysis of variance on speed of performance manneam measure | 88 |
| 8 | Summary table for MANOVA on attributions to the self, experimenter, task and subject role and univariate significance for self-attributions | 89 |
| 9 | Summary table for MANOVA on measures of anxiety, apprehensiveness, concern over performance and feelings of evaluation | 90 |

| TABLE | PAGE |
|-------|--|
| 10 | Summary table for MANOVA on measures of retrospective expected and achieved success 91 |
| 11 | Summary table for analysis of variance on measure of self-consciousness 92 |
| 12 | Summary table for MANOVA on measures of cooperation and defiance 93 |
| 13 | Mean overall frequency of personal pronoun use 94 |
| 14 | Mean frequency of personal pronouns for the first block of 20 trials 95 |
| 15 | Mean frequency of personal pronoun use for the second block of 20 trials 96 |
| 16 | Mean frequency of personal pronoun use for the third block of 20 trials 97 |
| 17 | Mean speed of performance in minutes 98 |
| 18 | Mean self-attributions 99 |
| 19 | Mean attributions to the experimenter 100 |
| 20 | Mean attributions to the task 101 |
| 21 | Mean attributions to the subject role 102 |
| 22 | Mean self-reported anxiety 103 |
| 23 | Mean self-reported apprehensiveness 104 |
| 24 | Mean self-reported concern over performance 105 |
| 25 | Mean self-reported feelings of evaluation 106 |
| 26 | Mean retrospective expected success 107 |
| 27 | Mean perceived success 108 |

| TABLE | | PAGE |
|-------|---|------|
| 28 | Mean self-reported self-consciousness | 109 |
| 29 | Mean self-reported cooperativeness | 110 |
| 30 | Mean self-reported defiance | 111 |

CHAPTER I

INTRODUCTION

Rosenberg (1965; 1969) has proposed that subjects in psychological experiments often experience evaluation apprehension, "an anxiety-toned concern that . . . [the subject] win a positive evaluation from the experimenter . . . or at least provide no grounds for a negative one" (1965, p.18). In the past several years a great deal of research has been conducted on subject behaviour in the laboratory, much of it investigating Rosenberg's formulation. Conceptual problems, such as the inability to discriminate evaluation apprehension from other roles or motives hypothesized to operate in the laboratory have been identified by some (Adair & Schachter, 1970; Weber & Cook, 1972). In spite of these problems, numerous authors have claimed there is substantial support for Rosenberg's formulation, and that evaluation apprehension is the predominant role or motive in the psychological laboratory (Kingsbury, Stevens & Murray, 1975; Rosenberg, 1969; Rosnow, Goodstadt, Suls & Gitter, 1973; Sigall, Aronson & Van Hoose, 1972; Silverman & Shulman, 1970; Weber & Cook, 1972).

Christensen (1977) has identified three components of Rosenberg's model: (1) an expectancy component, (2) an arousal component, and (3) a cueing component. Thus, subjects presumably enter the experiment with the expectation that some aspect of their mental health or personality will be evaluated by the experimenter. This expectancy may or may not be modified during the course of the experiment depending upon the experimental instructions, nature of the task, and so on. As a

result of the expectancy, subjects presumably experience an anxiety-toned concern regarding the evaluation they will receive from the experimenter. In response to the expectancy of evaluation and resultant anxiety, subjects are hypothesized to modify their behaviour based upon cues in the experimental situation, so as to receive a positive evaluation from the experimenter. The greater the evaluation apprehension experienced, the more the subject is expected to base behaviour on cues that communicate a healthy, mature image. This latter "cueing effect" is the final behavioural outcome of the evaluation apprehension process, and it presumably introduces bias into dependent measures.

A review of studies on evaluation apprehension (Appendix A) indicates that only one component of Rosenberg's three-component model has been supported. The predicted behaviour (i.e., the cueing effect) occurs as a function of differential evaluation apprehension instructions (e.g., Blake & Heslin, 1971; Burkhart, 1976; Campbell & Hannah, 1976; Duncan, Rosenberg & Finklestein, 1969; Hannah & Campbell, 1976; Kingsbury et al., 1975; Minor, 1970; Rosenberg, 1969; Rosnow et al., 1973; Sigal et al., 1970; Turner & Simons, 1974). However, confirmation of Rosenberg's model requires evidence indicating (a) that manipulations of evaluation apprehension affect subjects' expectancies of evaluation, (b) that arousal occurs as a result of this expectancy, and (c) that the expectation of evaluation and resultant arousal are both necessary and sufficient for the occurrence of the cueing effect. Unfortunately, there is insufficient evidence available regarding the expectancy component. It has been assessed only incidentally by single-item manipulation checks that for the most part are only peripher-

ally related to it (e.g., concern over performance). The arousal component of evaluation apprehension has been somewhat more fully investigated, yet results are generally not supportive. Although three studies using self-report measures have found increased anxiety associated with high evaluation apprehension instructions (Hannah & Campbell, 1976; Henchy & Glass, 1968; Rosenberg, 1969, p.312) a number of other studies using self-report measures (Burkhart, 1976; Innes & Young, 1975; Minor, 1970; Turner & Simons, 1974) as well as physiological measures (Christensen, 1977; Henchy & Glass, 1968; Paulus, Annis & Reisner, in press) have found no association between evaluation apprehension manipulations and levels of anxiety and arousal. However, in each of the studies above that investigated the cueing component, behavioural effects were observed independent of reported or measured arousal.

In summary, while the predicted behaviours occur as a function of differential evaluation apprehension instructions, there is little evidence that they are due to the theoretical antecedents proposed by Rosenberg; subjects demonstrate the cueing effect but this effect does not appear to be mediated by their expectancies of evaluation and experience of arousal. From extensive research it may only be concluded that certain manipulations affect subjects' use of cues which indicate how to do well on the task. However, the process mediating this behaviour is as yet undetermined.

The Theory of Objective Self-Awareness

An alternative theoretical approach to this phenomenon may be found in Duval and Wicklund's (1972; Wicklund, 1975) theory of objective

self-awareness. Briefly, this theory proposes that conscious attention is dichotomous, being directed toward the self (the state of objective self-awareness) or toward the environment (the state of subjective self-awareness). Any stimulus which reminds a person of his or her status as an object (e.g., seeing one's reflection in a mirror) will encourage self-focussing and produce a state of objective self-awareness (Wicklund, 1975).

The onset of objective self-awareness initiates a self-evaluation process during which the actual self is compared to some ideal or standard on the dimension most salient at the time. If the comparison results in a negative discrepancy (i.e., actual performance falls short of the standard) then heightened negative affect is experienced (Scheier & Carver, 1977) and there are attempts to reduce the discrepancy and/or avoid stimuli that encourage self-focussing. If the standard is met, a positive discrepancy is experienced leading to heightened positive affect (Scheier & Carver, 1977) and the individual seeks out, or at least does not avoid, stimuli that encourage objective self-awareness (Davis & Brock, 1974; Wicklund, 1975).

Evaluation Apprehension or Self-Awareness

Examination of manipulations of evaluation apprehension suggests that high evaluation apprehension instructions encourage a state of objective self-awareness, whereas low evaluation apprehension instructions facilitate a state of subjective self-awareness. High evaluation apprehension instructions which state, for example, that the research is concerned with picking out emotionally maladjusted students (Rosenberg, 1969, pp.311-312) clearly indicate that observation and evaluation will

occur on an individual level, make salient the dimension upon which evaluation will occur, and introduce the possibility that the subject will do poorly (i.e., experience a negative discrepancy). In contrast, low evaluation apprehension instructions which indicate the purpose of the research is to develop a model of social perception processes, and explicitly state interest only in group results (Rosenberg, 1969, pp. 311-312) take the focus off the individual and do not indicate any dimension for evaluation, nor the possibility of a negative discrepancy.

From a theoretical perspective it is likely that these instructions would result in different states of self-awareness. Wicklund (1975) has noted that "the knowledge of being attended to by others should . . . create a set towards self-observation. . . the self readily comes to the fore when the person realizes that the attention of the audience is on some feature of the self." (p.234). In addition, Duval and Wicklund (1972) have noted that the experimenter's "control [and observation] of the subject's behaviour implies to the subject that he is an object in the world and is thus a strong stimulus to self-awareness" (p.29). These statements suggest that Rosenberg's method of arousing or decreasing evaluation apprehension affects levels of self-awareness as indicated above. Research conducted within the context of social facilitation theory has led to similar conjectures by others (Carver & Scheier, 1978; Liebling & Shaver, 1973). However, the hypothesis that evaluation apprehension instructions effect levels of self-awareness has not been empirically tested.

The present study was designed to address this question. It was expected that compared to subjects given low evaluation apprehension

instructions, those given high evaluation apprehension instructions would experience heightened self-awareness. It was also predicted that subjects administered high evaluation apprehension instructions would experience a negative discrepancy when not exposed to cues indicating how to do well on the task, and experience a positive discrepancy when provided with such cues. These issues were investigated by manipulating (a) whether subjects received instructions designed to produce high or low evaluation apprehension (after Rosenberg, 1969), (b) the presence or absence of cues indicating how to do well on the task, and (c) whether or not subjects were exposed to a mirror while completing the dependent measure.

Following the reasoning of Davis and Brock (1975) the major dependent measure permitted an assessment of the frequency of self-reference in a sentence construction task. It was assumed that in a task where subjects were required to start their sentence constructions with either personal (I or we) or impersonal (he, she, they, or you) pronouns, the choice of pronoun would reflect subjects' state of awareness and the nature of the discrepancy. Subjects whose attention was focussed inward and who were experiencing a positive discrepancy were expected to make greater use of personal pronouns than those who were in a state of self-awareness and experiencing a negative discrepancy (the latter subjects were expected to avoid personal pronouns as a means of minimizing self-awareness), or those subjects in a state of subjective self-awareness.

Based upon this analysis, seven hypotheses, each reflecting a one degree-of-freedom contrast, were generated:

(1) In general, subjects exposed to the mirror will produce more self-references than will subjects not exposed to the mirror.

(2) In the absence of a mirror, there will be no difference in personal pronoun use between subjects given low evaluation apprehension instructions who are provided with cues unrelated to pronoun use, and those given low evaluation apprehension instructions without cues since both groups will be in a state of subjective self-awareness.

(3) In the presence of a mirror, a similar lack of difference between the low evaluation apprehension/cues present and low evaluation apprehension/cues absent conditions will be observed.

(4) In the absence of the mirror, the two low evaluation apprehension conditions referred to in Hypothesis 2 will not differ from a high evaluation apprehension/cues absent condition. Although subjects in the latter cell will be in a state of objective self-awareness, they will be experiencing a negative discrepancy.

(5) In the presence of a mirror, the two low evaluation apprehension conditions referred to in Hypothesis 3 will result in greater personal pronoun use than will the high evaluation apprehension/cues absent condition, since subjects in the latter condition will be experiencing a negative discrepancy while those in the former conditions will experience heightened self-awareness due to the mirror but no negative discrepancy.

(6) In the absence of the mirror, subjects in the high evaluation apprehension condition who are given cues unrelated to pronoun use will produce more self-references than subjects in the high evaluation apprehension/cues absent condition or subjects in the two low evaluation apprehension conditions.

(7) In the presence of the mirror, subjects in the high evaluation/cues present condition will utilize a greater number of personal pronouns than other subjects exposed to the mirror. These hypotheses are summarized and represented in Table 1.

Table 1

Hypothesized State of Self-Awareness, Nature of Discrepancy, and Frequency of Personal Pronoun Use as a Function of Mirror Presence, Evaluation Apprehension (EA) and cue presence.

| | No Mirror | | | | Mirror | | | |
|---|-----------|------|--------|------|---------|------|--------|------|
| | High EA | | Low EA | | High EA | | Low EA | |
| | Cues | None | Cues | None | Cues | None | Cues | None |
| Objective (OSA) or Subjective (SSA) Self-Awareness | OSA | OSA | SSA | SSA | OSA | OSA | OSA | OSA |
| Positive (P) or Negative (N) Discrepancy | P | N | - | - | P | N | P | P |
| Increase or Not in Personal Pronouns | Yes | No | No | No | Yes | No | Yes | Yes |

In contrast to the predictions above, the evaluation apprehension model would hypothesize no differences between groups. Neither levels of evaluation apprehension, the presence or absence of cues (unrelated to personal pronouns) the presence or absence of the mirror, nor their

interactions should affect personal pronoun use, since there is nothing inherently good or healthy in more than a chance level of self-reference.

Secondary measures included an assessment of subjects' attributions for their experimental performance. Since a state of objective self-awareness has been related to an increase in self-attribution (Buss & Scheier, 1976; Duval & Wicklund, 1973) it was expected that both the presence of the mirror and high evaluation apprehension instructions would result in greater self-attribution. Once again, the evaluation apprehension model would make no predictions of group differences.

Another secondary measure, the time subjects require to complete the experimental task was expected to be affected by both the cues on how to do well (which told subjects that fast performance was desirable), and subjects' state of self-awareness. Thus, it was expected that subjects exposed to the cues in the high evaluation apprehension condition and/or in the mirror condition would require less time to complete the task than subjects exposed to the cues in the low evaluation apprehension/mirror absent condition. The latter group of subjects were expected to perform no faster than subjects in the no cues condition.

CHAPTER II

METHOD

Subjects and Experimenters

Subjects were 173 male and female introductory psychology students who participated in order to partially fulfill a course requirement. The data from 13 subjects were discarded prior to scoring due to either a failure to follow experimental instructions, or suspiciousness over some aspect of the experimental instructions as indicated on the post-experimental questionnaire. The remaining 80 subjects of each sex were randomly assigned to conditions within the constraint that there would be equal numbers within each cell of the design.

The experimenters were two male psychology students in their mid 20's. One was an honours student, the other a graduate student. The experimenters were blind to the purpose of the experiment, the hypotheses, and the exact nature of the major dependent variable.

Design and Experimental Setting

The experiment consisted of a 2^5 fully-crossed factorial design, with the independent variables being: (a) mirror presence or absence, (b) high or low evaluation apprehension instructions, (c) cue presence or absence, (d) sex of subject, and (e) experimenter. All factors were between-subjects.

The experimental room contained a large (1.93 m x 1.32 m) one-way mirror set permanently in the wall with the reflective side facing the experimental room. Directly against the base of the mirror

was a table at which the subject was seated facing the mirror. In front of the subject was a tape-recorder (used to deliver instructions), 61 index cards turned face-down, a pencil and several sheets of blank paper. To the right and slightly to the rear of the subject's seat were the experimenter's table and chair. The latter were out of the subject's view when the subject faced ahead, and were not visible in the mirror's reflection from the subject's position.

Procedure

Subjects were tested individually. In the mirror present condition the subject's attention was immediately directed toward the mirror. The subject was told that many people had been distracted by the mirror, wondering if anyone was watching them during the experiment. The subject was assured that no one would be watching, and this was supplemented by showing the subject that the observation room was empty, that the observation side of the mirror was covered with a screen, and by leaving the door to the observation room ajar. Post-experimental questioning confirmed that subjects did not think the mirror was connected with the research. In the Mirror absent condition nothing was said about the mirror since it was completely covered with blank white paper.

Upon being seated each subject was told that the instructions were on the tape-recorder (see Appendix B). The experimenter turned on the tape-recorder and withdrew to his seat. The subject was then told:

The study you are participating in today involves the collection of some survey data. Your task today is called a sentence construction

task. On the desk in front of you, you will find a pencil, some paper, and a stack of 61 cards turned face down. Once the experiment begins, the cards are to be turned over one at a time. On each card is a past-tense verb and six pronouns. Your task will be to construct and write down a sentence that begins with one of the pronouns, and uses the verb on the card. Do not think about the sentence for too long; just write down the first sentence that comes into your mind.

The order of the pronouns was randomized for each card. The top card was used to provide two sample sentences, the first starting with he, the second with we (see Appendix F for a listing of the verb-pronoun sets).

The subject in the high evaluation apprehension condition was told the sentence construction task was a recently developed test of general intelligence, and that research had indicated scores on it were related to other tests of general intelligence. The purpose of the current session, the subject was informed, was to further develop the sentence construction task as an instrument for picking out from the university population those individuals unsuitable for university training and degrees. This explanation was particularly credible for many students, since the introduction of English proficiency screening tests was being discussed on campus at the time. The taped instructions continued stating that in order to accomplish our purpose, the subject's score on the sentence construction task would be compared to marks in psychology and to overall GPA. Each was requested to put his/her full name and student I.D. number on all materials, and was assured that their grade in psychology and standing in university would not be

affected by their performance in the experiment.

The subject in the low evaluation apprehension condition was told that the task concerned integrating into a more simplified model, the various dimensions involved in temporal-linguistic expressive processes, and that this would be accomplished by a method statisticians call stochastic-inferential mathematical modelling. They were told that the purpose of the session was to develop mathematical formulae and sampling distributions to describe these processes. Subjects were asked not to put their name or other identification on any materials as interest was in group results. Both sets of evaluation apprehensions were based very closely upon Rosenberg (1969) modified so as to be consistent with the experimental task.

After having delivered the task instructions and one set of evaluation apprehension instructions, the tape-recording continued for the subject in the cues present condition by stating that there should be no trouble finishing the task within the time-limits of the one-hour experiment. The subject was informed that although people from the general population usually required as much as 40 to 50 minutes to complete the task, university students usually needed no more than 30 minutes, and that some were able to finish the task within as little as 15 minutes. Pretesting had indicated that virtually all subjects were able to finish within this time limit without difficulty. These latter instructions were omitted for the subject in the cues absent condition. In both conditions, a clock was visible to the subject.

Once the instructions were completed, the experimenter turned off the tape-recorder and ascertained that the subject had understood the

instructions. The experimenter then asked the subject to proceed with the remaining 60 cards and returned to his desk. The experimenter unobtrusively assessed the time until task completion by means of a stopwatch hidden in the desk. Following completion of the task, the subject was given a post-experimental questionnaire containing secondary measures, manipulation checks and suspiciousness assessments. Upon completion of the session, the subject was informed of the deceptions associated with the evaluation apprehension and cues instructions. The purpose of the study and the nature of the dependent measure were not disclosed immediately following the experiment in order to minimize the possibility that this information might be communicated to future subjects. The importance of not discussing the experiment with anyone else was also stressed. Following completion of the study a complete description of its purpose and results was mailed to each subject.

Post-Experimental Questionnaire

Aside from speed of performance, all secondary measures, manipulation checks and assessments of suspiciousness were obtained on the post-experimental questionnaire (see Appendix C). The questionnaire contained ten items, each presented on a separate sheet of paper so that items appearing later in the questionnaire could not influence responses to earlier questions. Secondary measures and manipulation checks constituted the first four items. The first item asked subjects to indicate (on seven-point scales) how they felt with regard to the following: (a) anxious, (b) self-conscious, (c) cooperative, (d) defiant, (e) apprehensive, (f) concerned over how I would do, (g) like I was being

evaluated. Subsequent items asked subjects to indicate on seven-point scales how well they expected to do when they started the task, how well they thought they were doing during the task, the degree to which they felt their experimental behaviour was influenced by: (a) the type of person they were, (b) the type of person the experimenter was, (c) the nature of the experimental task, and (d) how any person in a psychology task would act. (Assessing attribution to the self, the experimenter, the task, and the subject role, respectively).

The final six items of the questionnaire constituted a 'funnel' type (Page, 1968) suspiciousness questionnaire. Briefly, these questions concerned subjects' perceptions of the experimental purpose, whether they thought the experimenter wanted them to make up sentences in any particular way, if they thought they were to use some of the pronouns more often than others, if they felt they had been deceived in the experiment, if they thought the mirror had anything to do with the experiment (mirror present condition only) and if they had heard or read of similar experiments. Data were discarded from analysis if the subject indicated that pronoun choice had been made on a systematic basis (e.g., always using the first pronoun on the index card), or if the subject had specific suspicions regarding the experimental instructions.

CHAPTER III

RESULTS

Effectiveness of the Manipulations

The effectiveness of the evaluation apprehension manipulation was assessed by multivariate analysis of variance (MANOVA) on the self-report measures of anxiety, apprehensiveness, concern over performance and feelings of evaluation. The analysis indicated a significant effect for evaluation apprehension on the set of measures, $F(4,125) = 3.18$, $p < .016$. Examination of the standardized discriminant weights (SDW's), an assessment of each measure's nonredundant contribution to multivariate group differences, indicates the effect was solely attributable to subjects' concern over performance (SDW = .64) and feelings of evaluation (SDW = .56), with reported anxiety and apprehensiveness not discriminating between groups (both SDW's $< |.06|$). Univariate results were consistent with this pattern. As expected, subjects in the high evaluation apprehension condition reported greater concern over performance ($M = 4.2$) and felt more evaluated ($M = 4.8$) than did subjects in the low evaluation apprehension condition (M 's = 3.3 and 3.9, respectively). Thus, the manipulation had effects typical of many previous studies: subjects felt more concerned over their performance and felt more evaluated in the high evaluation apprehension condition. However, once again no support was found for the arousal component of Rosenberg's (1969) model as assessed by the self-reports of anxiety and apprehensiveness.

It was expected that subjects provided with speed of performance cues would experience a positive discrepancy and hence would report greater

success at the task than would subjects not exposed to these cues. Based upon this reasoning the effectiveness of manipulating cue presence was assessed by MANOVA on (a) subjects' retrospective reports of the degree of success expected at the start of the task, and (b) subjects' perceptions of success achieved while doing the task. Overall, males reported greater success than females, $F(2,127) = 4.15$, $p < .018$. However, as the significant interaction of subject sex with cue presence indicated [$F(2,127) = 2.98$, $p < .054$] this main effect may be attributed to males having shown the expected reaction to the provision of cues (increased perceived success), and females the opposite (see Table 2). The two measures contributed approximately equally to this effect (SDW's=0.64 and 0.53 for expected and achieved success, respectively). Thus, a positive discrepancy was likely induced for males only. No other significant results were observed on these measures.

Table 2
Mean Reported Expected and Achieved Success as a Function
of Presence of Cues and Sex of Subject

| Measure | Male | | Female | |
|----------|------|---------|--------|---------|
| | Cues | No Cues | Cues | No Cues |
| Expected | 5.7 | 5.2 | 4.4 | 5.2 |
| Achieved | 5.2 | 4.9 | 4.3 | 4.8 |

The effect of the mirror manipulation was examined by a univari-

ate analysis of variance on self-reported self-consciousness. Results indicated an interaction of the mirror with sex of subject, $F(1,128) = 4.93$, $p < .028$. Males reported more self-consciousness in the mirror present condition ($M = 4.4$) than in the mirror absent condition ($M = 3.6$) whereas females unexpectedly reported the reverse (M 's = 3.2 and 3.7 for the mirror present and absent, respectively). However, there were several higher-order, uninterpretable interactions which qualify this result,¹ indicating that in general the mirror manipulation did not have its intended effect upon subjects (see Appendix G).

Frequency of Personal Pronoun Use

Frequency of personal pronoun use was analyzed by a univariate analysis of variance. The variance corresponding to the main and interaction effects for the three independent variables of primary interest, i.e., the mirror presence, evaluation apprehension and cue presence manipulations (accounting for seven degrees-of-freedom) was partitioned to represent the seven hypotheses of the study. Experimenter and sex of subject were fully crossed with each other and with the seven a priori contrasts so that all between-subject variance in the model was accounted for. The seven contrasts, in the same order as the original hypotheses, are presented in Table 3. The trials effect (number of personal pronouns per block of 20 sentences) was examined by MANOVA, with the dependent measures being (a) the change in frequency of personal pronoun use from block 1 to block 2, and (b) the change in personal pronoun use from the average of blocks 1 and 2 to block 3.

As might be expected on the basis of the mirror manipulation check, analysis of Contrast 1 indicated a failure to replicate the

Table 3

Mean Frequency of Personal Pronoun Use and a priori Contrasts as a
Function of Mirror Presence, Evaluation Apprehension (EA), Cue
Presence and Sex of Subject

| Subject | Mirror Absent | | | | Mirror Presence | | | |
|----------|---------------|---------|--------|---------|-----------------|---------|--------|---------|
| | High EA | | Low EA | | High EA | | Low EA | |
| | Cues | No Cues | Cues | No Cues | Cues | No Cues | Cues | No Cues |
| Male | 28.8 | 23.6 | 21.9 | 23.2 | 27.3 | 23.8 | 24.4 | 21.6 |
| Female | 21.7 | 21.5 | 22.0 | 24.3 | 25.9 | 21.3 | 24.3 | 22.4 |
| Cell No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

Contrasts: (refer to cell numbers above)

(1) Cells 1 + 2 + 3 + 4 vs. Cells 5 + 6 + 7 + 8

(2) Cell 3 vs. Cell 4

(3) Cell 7 vs. Cell 8

(4) Cell 2 vs. $\frac{(\text{Cells } 3 + 4)}{2}$

(5) Cell 6 vs. $\frac{(\text{Cells } 7 + 8)}{2}$

(6) Cell 1 vs. $\frac{(\text{Cells } 2 + 3 + 4)}{3}$

(7) Cell 5 vs. $\frac{(\text{Cells } 6 + 7 + 8)}{3}$

mirror effect found in previous studies, $F < 1$. This contrast interacted with experimenter, $F(1,128) = 5.43$, $p < .021$, such that one experimenter obtained results in the predicted direction (M 's = 24.9 and 22.2 for the mirror present and absent, respectively) while the second experimenter obtained the reverse effect (M 's = 22.9 and 24.9 for the mirror present and absent, respectively).

As expected, there was no difference in the frequency of personal pronoun use as a function of cue presence in the low evaluation apprehension conditions (Contrasts 2 and 3), (both p 's $> .24$). In addition, as predicted for the mirror absent condition, the average of these two low evaluation apprehension conditions did not differ from the high evaluation apprehension/cues absent condition (Contrast 4), $F < 1$. Similarly, no difference was observed on the analogous contrast in the mirror present condition (Contrast 5), $F < 1$, although a difference was expected as a function of exposure to the mirror and a positive discrepancy in the low evaluation apprehension conditions.

Examination of the last two contrasts permits a test of the major hypothesis of the study; that high evaluation apprehension instructions induce a state of objective self-awareness, and that this state is reflected in personal pronoun usage when subjects are also experiencing a positive discrepancy due to exposure to cues. Examination of the cells in the mirror present condition (Contrast 7) provide complete support for the hypothesis, $F(1,128) = 4.63$, $p < .033$. Subjects in the high evaluation apprehension/cues present condition used personal pronouns to a greater extent ($M = 26.6$) than did subjects in the three other mirror present conditions ($M = 23.0$). Examination of

the mirror absent analog to this contrast (Contrast 6) provides additional, but not complete support for the major hypothesis; overall, there was no difference in personal pronoun use between the high evaluation apprehension/cues present condition and the three other mirror absent conditions with which it was compared ($p < .17$). However, as the significant interaction of this contrast with sex of subject indicates [$F(1,128) = 4.72, p < .032$], the expected effect was obtained for males. When the mirror was absent, males in the high evaluation apprehension/cues present condition produced a greater number of personal pronouns ($M = 28.8$) than did males in the three other mirror absent conditions ($M = 22.9$); for females no differences were observed (see Table 3).

Finally, when the mirror was absent, the contrast of the high evaluation apprehension/cues present condition with the average of the three other cells (Contrast 6) was not constant over trials ($F(2, 127) = 3.02, p < .052$). Examination of personal pronoun use per block of 20 trials (Table 4) indicates that in all conditions there was little change from the first to the second block of trials ($SDW = .22$). However, the high evaluation apprehension/cues present condition did show an appreciable decrease from the average of blocks 1 and 2 to block 3, while the other mirror absent cells showed no change over trials ($SDW = .97$). This result may indicate that the impact of high evaluation apprehension instructions dissipated over time. Alternatively, subjects may have deliberately reduced personal pronoun use on later trials after observing the degree to which they were employed in earlier trials. The latter interpretation is consistent with remarks made by some subjects on the post-experimental questionnaire.²

Table 4

Mean Frequency of Personal Pronoun Use per Block of 20 Trials
as a Function of Evaluation Apprehension (EA) and Cue
Presence when the Mirror was Absent

| Block | Mirror Absent | | | |
|-------|---------------|---------|--------|---------|
| | High EA | | Low EA | |
| | Cues | No Cues | Cues | No Cues |
| 1 | 9.2 | 7.6 | 7.3 | 8.1 |
| 2 | 8.5 | 7.5 | 7.4 | 7.5 |
| 3 | 7.6 | 7.5 | 7.7 | 8.4 |

In summary, analysis of the major dependent measure indicates predictions regarding two of the seven contrasts were not supported. However, both these contrasts concerned the effects of the mirror manipulation only, and thus are not critical to the major hypothesis of the study. Of the remaining five contrasts, all of which were relevant to the major hypothesis, four received complete support and the fifth received support for male subjects only. In general, the pattern of results indicate that high evaluation apprehension instructions increase objective self-awareness, and that the provision of cues induces a positive discrepancy so that this state is reflected in the frequency of personal pronoun use.

Speed of Performance

Analysis of the amount of time taken to complete the task showed

an unexpected significant effect for evaluation apprehension, $F(1,128) = 12.24$, $p < .0007$. Examination of the relevant means indicates that subjects took less time to complete the task in the low ($\bar{M} = 18.5$ mins.) as compared to the high evaluation apprehension condition ($\bar{M} = 22.1$ mins.).

This result may be attributable to an increase in generalized arousal above some optimal level in the high evaluation apprehension condition, as per the Yerkes-Dodson (1908) law. However, self-reports on anxiety and apprehensiveness presented earlier do not support this interpretation. A more parsimonious interpretation is that concern over performance and thoughts about self- or other evaluation distracted subjects and impeded speed of performance in the high evaluation apprehension condition.

As expected subjects receiving cues referring to response time tended to take less time on the task ($\bar{M} = 19.3$ mins.) than did those not receiving cues ($\bar{M} = 21.3$ mins.), $F(1,128) = 3.23$, $p < .075$. While these results indicate subjects used the cues to some extent when responding, the effect is not as strong as might be expected. One possible explanation for this is that the response time mentioned in the cues (15 to 30 mins.) was designed to allow subjects to feel they could easily finish in time and thus experience a positive discrepancy. The fact that speed of performance was well within these limits even in the cues absent condition suggests that subjects provided with cues may have felt little need to hurry and thus did not make a maximum effort. This interpretation may also explain the failure to find the expected interactions of cues presence with evaluation apprehension and with

mirror presence.

Other Results

Analysis of subjects' self-attributions did not indicate the expected effect for evaluation apprehension or the mirror, yielding only a significant effect for experimenter, $F(1,128) = 4.11$, $p < .045$, with experimenter 1 producing less self-attribution ($M = 5.0$) than did experimenter 2 ($M = 5.6$) (see Appendix G).

As indicated earlier, MANOVA was conducted on subjects' ratings of anxiety, apprehensiveness, concern over performance and feelings of evaluation. In contrast to the effects of high evaluation apprehension instructions, subjects were less concerned over performance ($SDW = 1.0$) when exposed to the mirror ($M = 3.3$) than when not ($M = 4.3$), $F(1,125) = 3.27$, $p < .014$. No other variables contributed to univariate or multivariate group differences for this effect.

Analysis also indicated a multivariate interaction of evaluation apprehension, cue presence and sex of subject [$F(4,125) = 3.56$, $p < .009$], in which group differences were maximized by the contrast of concern over performance on the one hand ($SDW = +.99$) and feelings of evaluation on the other ($SDW = -.73$; all other SDW 's $< |.24|$). Examination of group means (Table 5) indicates that males' feelings of evaluation were determined by both the evaluation apprehension and cue presence manipulations. Even when the low evaluation apprehension instructions indicated that individual evaluation would not occur, the provision of cues suggesting a dimension of evaluation made males feel as though they were being evaluated. However, this increase in feelings of evaluation was not accompanied by increased concern over

performance, so that males were actually least concerned in the low evaluation apprehension/cues present condition. In contrast, females' feelings of evaluation reflect only the difference in evaluation apprehension instructions and were unaffected by the provision of cues. However, their concern over performance was affected by the presence of cues, such that females in the low evaluation apprehension condition were more concerned over performance when given cues than when not.

Table 5

Mean Self-Reported Feelings of Evaluation and Concern over Performance for the Interaction of Evaluation Apprehension (EA), Cue Presence and Sex of Subject

| Measure | Sex of Subject | High EA | | Low EA | |
|------------|----------------|---------|---------|--------|---------|
| | | Cues | No Cues | Cues | No Cues |
| Evaluation | Male | 4.7 | 5.3 | 4.4 | 3.2 |
| | Female | 4.6 | 4.8 | 4.1 | 4.1 |
| Concern | Male | 4.2 | 4.2 | 2.5 | 3.5 |
| | Female | 3.8 | 4.7 | 4.3 | 3.1 |

These differences between the sexes may in part reflect perceptions of success as a function of cue presence (reported earlier) as males associated greater success and females less success, with the provision of cues. In any case, the fact that the sexes reacted differently to the two measures, and in particular that concern over

performance was heightened under conditions where there was relatively little feeling of evaluation, suggests that subjects' rated feelings of evaluation represent cognizance of external evaluation, while ratings of concern over performance reflect the self-evaluation process hypothesized to be associated with the onset of objective self-awareness.

Validity of the Personal Pronoun Measure

An evaluation of the validity of frequency of personal pronoun use as a measure of self-awareness was assessed by examination of its relationship to subjects' ratings of other measures. As would be expected from the perspective taken in this study, personal pronoun use correlated significantly with both self-attributions $r(158) = .16$, $p < .044$, and perceptions of achieved success, $r(158) = .15$, $p < .051$. More importantly, the interaction of these two variables (represented by their product vector) correlated somewhat more strongly with personal pronoun use $r(158) = .23$, $p < .003$, than did either of the two measures singly. Such a result would be expected if personal pronoun use reflected an increase in self-focus coupled with a positive discrepancy. For descriptive purposes, this interaction was investigated by assigning subjects to one of four groups according to ratings on each of the self-attribution and success measures; subjects rating themselves low (from one to three) on the seven-point scale, and those rating themselves high (from five to seven). Consistent with the conceptualization underlying use of the personal pronoun measure, those subjects rating themselves high on both variables ($n = 73$) used more personal pronouns ($M = 25.3$) than did those rating themselves low on both variables ($n = 6$, $M = 22.3$), low on success and high on self-attribution, ($n = 16$, $M = 22.4$) or vice versa ($n = 14$, $M = 21.6$). Unexpectedly, personal pronoun use did not correlate with self-rated self-consciousness.

These results give some indication that the personal pronoun measure is a valid measure of self-awareness when there is a positive discrepancy. However, these results are not conclusive given the failure of the measure to be affected by the mirror manipulation. For this reason a second sample of subjects were tested.

Twenty-seven male and 28 female introductory psychology students who had not participated in the major study were given the 60 verb-pronoun sets used earlier. Subjects were told the study concerned the collection of some survey data. For each verb-pronoun set they were asked to write down the first sentence that came to mind that started with one of the pronouns and used the verb. After completing the 60 sentences, subjects were given an unlabelled copy of the Self-Consciousness Scale (Fenigstein, Scheier & Buss, 1975), which through the private self-consciousness subscale, assesses the individual difference analog to a state of objective self-awareness (Carver & Scheier, 1978). (See Appendix E and F for procedures and measures.) Results confirmed the validity of the personal pronoun measure; higher scores on the private self-consciousness subscale were associated with a greater frequency of personal pronoun use, $r(53) = .35$, $p < .005$, one-tailed.

CHAPTER IV

DISCUSSION

Two general classes of findings warrant extensive discussion. The first concerns the central hypothesis that instructions used to influence evaluation apprehension actually affect levels of objective self-awareness. The second concerns the failure to replicate the typical effect of the mirror on a number of measures.

Evaluation Apprehension and Self-Awareness

The results supported the hypotheses that high evaluation apprehension instructions increase levels of objective self-awareness and that this would be evidenced in frequency of personal pronoun use only when subjects were experiencing a positive discrepancy due to the provision of cues. This result was obtained for males generally, and for females when exposed to the mirror.

The finding that subjects' frequency of personal pronoun use was unaffected in the absence of cues indicates that high evaluation apprehension instructions in isolation induce self-awareness and a negative discrepancy. Results also indicated that in addition to affecting subjects' cognizance of external evaluation, the high evaluation apprehension instructions increased subjects' concern over performance as a result of a self-evaluation process, as would be predicted by objective self-awareness theory. Although not inconsistent with the evaluation apprehension approach, a self-evaluation process would not be predicted by that theory since it places all emphasis on the experimenter's evaluation.

Similarly, the evaluation apprehension model cannot account for the results on frequency of personal pronoun use. Although it may appear that the present study merely demonstrated a cueing effect on the pronoun measure, this is clearly not the case. There was no indication to subjects that personal pronouns in particular were of interest in the study, and when questioned post-experimentally none indicated that they perceived a positive evaluation was associated with increased self-reference; an association which is necessary if evaluation apprehension is to provide a viable interpretation.

The only finding inconsistent with the major hypothesis was that females in the mirror absent condition failed to increase their use of personal pronouns as a function of high evaluation apprehension instructions and cue presence. A post hoc analysis suggests that females reacted to the cues with a lesser expectation of success, possibly because the cues changed their perception of the task requirements from concern with verbal skills to a less sex-appropriate emphasis on speed of performance. In addition, females not exposed to the mirror were relatively concerned over their performance. These observations suggest that females in these conditions were experiencing a negative discrepancy, and would not increase personal pronoun use since it would only maintain or increase already unpleasant levels of objective self-awareness.

Females in the high evaluation apprehension/cues present condition who were exposed to the mirror, although expecting no greater degree of success than females not exposed to the mirror, were less concerned over performance possibly (as discussed below) because the

mirror actually served to lessen self-awareness. This relative lack of concern conceivably permitted these subjects to express their self-awareness, somewhat heightened by the evaluation apprehension instructions, without finding it excessively unpleasant. Further studies manipulating the nature of the discrepancy for both sexes are necessary to investigate this interpretation.

The Mirror Effect

There are several possible reasons for the failure to replicate the mirror effect. Of greatest concern, of course, is that the failure to replicate may be due to the insensitivity of personal pronoun usage to differences in levels of objective self-awareness. This alternative appears unlikely for several reasons. First, correlations with the private self-consciousness scale confirmed that the degree to which an individual is self-aware is related to frequency of personal pronoun use. Second, several self-report measures conceptually related to objective self-awareness were also unaffected by the mirror (self-attributions), showed a complex pattern of uninterpretable results for the mirror (the higher order interactions involving the mirror on reported self-consciousness; see Appendix G) or showed effects opposite to those expected on the basis of self-awareness theory (less concern over performance in the mirror condition). Further, the finding that self-attributions, perceived success, and, more importantly, their interaction were significant predictors of personal pronoun use suggests that as indicated, the measure was sensitive to the combination of heightened self-awareness and a positive discrepancy. Finally, the

measure is conceptually identical and operationally similar to measures successfully employed by Brock and Davis (1975) in two previous studies of objective self-awareness.

Perhaps the most likely reason for the ineffectiveness of the mirror is to be found in the size of the mirror and of the room in which subjects participated. Subjects faced a mirror that covered almost an entire wall and reflected much of the large (4.76 m x 4.42 m) room. In contrast, all previous research reporting the mirror effect, while not specifying the size of either of these features indicate the subject was seated in a cubicle, and utilized a mirror small enough to be turned over for the mirror present/mirror absent manipulation (e.g., Buss & Scheier, 1976; Davis & Brock, Exp. 2, 1975; Duval & Wicklund, Exp. 2, 1973; Liebling & Shaver, 1973). In one study where the size of the mirror was indicated (Gibbons, Carver, Scheier & Hormuth, in press) its area was 0.92 m², while the mirror in the present study had an area over two and a half times as large, 2.55 m². In the former studies, subjects looking up would find it difficult to avoid looking at their own face, thus increasing objective self-awareness. In the present study, subjects who looked up and straight ahead would see their face as well as the room, but if they looked to the side they would see only the empty room. Anecdotal reports from the experimenters indicate that this happened frequently. At the start of the experiment it was expected that subjects looking up and seeing the empty room would still be aware of their reflection, and would be made objectively self-aware by the realization they were the only subject in the room. However, in light of the present results it appears that the opportunity to look

at the empty room served as a convenient device for reducing self-awareness and may have totally eliminated or even reversed the typical effect of the mirror. While this explanation seems plausible, further research is required.

The Cueing Effect

Examination of the objective self-awareness formulation also suggests that this theory can account for the cueing effect typically found in studies of evaluation apprehension. The key difference between the two approaches is that the evaluation apprehension approach focusses upon the subject's concern over the experimenter's evaluation while the objective self-awareness approach places the emphasis on self-evaluation and its consequences.

As indicated earlier one consequence of high evaluation apprehension instructions is that a negative discrepancy is produced in subjects. Since in the typical evaluation apprehension study subjects are unable to avoid the stimuli that cause self-awareness (short of leaving the experiment prematurely), the subject's only response alternative is to attempt to reduce the discrepancy by lowering standards or altering performance so that it meets the standard. The latter course may be undertaken with relative ease when the experimenter supplies cues indicating how to perform well on the experimental task.

Implications for Research

If the foregoing analysis is correct, then it not only indicates the manner in which high evaluation apprehension instructions introduce bias, i.e., by subjects making greater use of performance or social desirability cues as a result of increased self-awareness, but it also

suggests how data may be afforded greater precision through the application of other research on self-awareness. For example, since subjects who are self-aware are more sensitive to internal states (Gibbons, Carver, Scheier & Hormuth, in press) and their own affective reactions (Scheier & Carver, 1977), more accurate and more introspective self-reports on these phenomena might result from the induction of self-awareness in subjects just prior to obtaining their report. There is also evidence of a considerably stronger relationship between various types of self-report and the corresponding behaviours when subjects are made self-aware as either set of data is being collected (Carver, 1975; Gibbons, 1978; Pryor, Gibbons, Wicklund, Fazio & Hood, 1977).

There may appear to be an inconsistency in this reasoning: if high evaluation apprehension instructions increase self-awareness, and self-awareness is linked to data that have greater precision and accuracy, why then has the evaluation apprehension construct been related to increased artifact in psychological data? However, this inconsistency is more apparent than real. A key component of high evaluation apprehension instructions has been to link the experimental task to a dimension such as intelligence in a manner such that self-awareness is induced by the instructions and subjects' behaviours become oriented toward achieving ideal standing (indicated by the cues) on this dimension. The consequence of such a situation has been clearly demonstrated by Vallacher and Solodky (1978). They found that when instructions on a puzzle solving task emphasized competence and intellectual performance (as high evaluation apprehension instructions often do) all but one of the self-aware subjects cheated in order to

improve standing on the task. In sharp contrast, when competence was not associated with the task, internal moral standards presumably became salient to self-aware subjects, and not one cheated. For those subjects not made self-aware, about one-half cheated regardless of task instructions. Similarly, high evaluation apprehension instructions, by emphasizing competence, ability, mental health and so forth, may result in subjects "cheating" (i.e., giving the cued response) so as to do well on the task. However, it is clear that this does not have to be the only outcome of increased self-awareness, whether it is produced by high evaluation apprehension instructions or some other means. Such stimuli, when accompanied by instructions which make salient dimensions such as honesty, accuracy, and ability to introspect, rather than the appearance of competence on the experimental task, may improve the precision and accuracy of psychological data.

Summary and Conclusions

The results of the present study provide support for the hypothesis that instructions designed to arouse evaluation apprehension in fact increase objective self-awareness. The critical role played by the cues in permitting subjects to achieve a positive discrepancy suggests that the phenomena associated with self-awareness may account for the cueing effect typically associated with evaluation apprehension. In addition, it was suggested that if the cueing effect is conceptualized from the perspective of self-awareness theory, it is possible to utilize it as an experimental technique to increase the precision and accuracy of certain types of psychological data.

On the other hand, it is not clear from this study that the only effect of high evaluation apprehension instructions is to increase self-awareness . It is possible that in addition to encouraging self-focussing, high evaluation apprehension instructions may have effects unrelated to self-awareness. One manner in which these additional effects may be identified is through comparison with the effects of other methods of increasing self-awareness. Such a comparison would be misleading in the present study since the mirror did not have its intended effect, and it is unclear exactly in which ways, if any, it affected self-awareness.

Finally, the results of the present study demonstrate the desirability and utility of examining subject behaviour in the laboratory through use of the same concepts and theoretical frameworks employed to understand and predict behaviour in any social interaction. Much of the theory in social psychology has been examined and refined through empirical research conducted in the laboratory. If this research cannot be successfully applied to the controlled environment from which it emerged, it is unlikely it will be of utility in predicting behaviour in the complex and uncontrolled environment of the "real" world.

References

- Adair, J.G. & Schachter, B.S. To cooperate or to look good?: The subjects' and the experimenters' perceptions of each others' intentions. Journal of Experimental Social Psychology, 1972, 8, 74-85.
- Blake, B.F. & Heslin, R. Evaluation apprehension and subject bias in experiments. Journal of Experimental Research in Personality, 1971, 5, 57-63.
- Burkhart, B.R. Apprehension about evaluation, paralanguage cues and the experimenter-bias effect. Psychological Reports, 1975, 39, 15-23.
- Buss, D.M. & Scheier, M.F. Self-consciousness, self-awareness, and self-attribution. Journal of Research in Personality, 1976, 10, 463-468.
- Campbell, A.J. & Hannah, T.E. The role of evaluation apprehension in Rokeach's value change paradigm. Journal of Social Psychology, 1976, 98, 89-95.
- Carver, C.S. Physical aggression as a function of objective self-awareness and attitudes toward punishment. Journal of Experimental Social Psychology, 1975, 11, 510-519.
- Carver, C.S. & Scheier, M.F. Self-focusing effects of dispositional self-consciousness, mirror presence, and audience presence. Journal of Personality and Social Psychology, 1978, 36, 324-332.
- Christensen, L. Evaluation apprehension: A viable concept? Paper presented at the annual convention of the American Psychological Association, San Francisco, 1977.

- Davis, D. & Brock, T.C. Use of first person pronouns as a function of increased objective self-awareness and performance feedback. Journal of Experimental Social Psychology, 1975, 11, 381-388.
- Duncan, S., Jr., Rosenberg, M.J., & Finkelstein, J. The paralanguage of experimenter bias. Sociometry, 1969, 32, 207-219.
- Duval, S., & Wicklund, R.A. A theory of objective self-awareness. New York: Academic Press, 1972.
- Duval, S., & Wicklund, R.A. Effects of objective self-awareness on attribution of causality. Journal of Experimental Social Psychology, 1973, 9, 17-31.
- Epstein, Y.M., Suedfeld, P., & Silverstein, S.J. The experimental contract: subjects' expectations of and reactions to some behaviors of experimenters. American Psychology, 1973,
- Federoff, N.A. & Harvey, J.H. Focus of attention, self-esteem, and attribution of causality. Journal of Research in Personality, 1976, 10, 336-345.
- Fenigstein, A., Scheier, M.F., & Buss, A.H. Public and private self-consciousness: Assessment and theory. Journal of Consulting and Clinical Psychology, 1975, 43, 522-527.
- Festinger, L. & Carlsmith, J.M. Cognitive consequences of forced compliance. Journal of Abnormal and Social Psychology, 1959, 58, 203-210.
- Fillenbaum, S. Prior deception and subsequent experimental performance: The "faithful" subject. Journal of Personality and Social Psychology, 1966, 4, 532-537.

- Green, R.G. Effects of evaluation apprehension on memory over intervals of varying length. Journal of Experimental Psychology, 1974, 102, 908-910.
- Geller, V. & Shaver, P. Cognitive consequences of self-awareness. Journal of Experimental Social Psychology, 1976, 12, 99-108.
- Gibbons, F.X. Sexual standards and reactions to pornography: Enhancing behavioral consistency through self-focused attention. Journal of Personality and Social Psychology, 1978, 36, 976-987.
- Gibbons, F.X., Carver, C.S., Scheier, M.F., & Hormuth, S.E. Self-focused attention, suggestibility, and the placebo effect: Fooling some of the people some of the time. Journal of Experimental Social Psychology, in press.
- Hannah, T.E. & Campbell, A.J. Long-term value change as a function of evaluation apprehension. Paper presented at the annual meeting of the Eastern Psychological Association, 1976.
- Henchy, T., & Glass, D.C. Evaluation apprehension and the social facilitation of dominant and subordinate responses. Journal of Personality and Social Psychology, 1968, 10, 446-454.
- Innes, J.M. & Young, R.F. The effect of presence of an audience, evaluation apprehension, and objective self-awareness on learning. Journal of Experimental Social Psychology, 1975, 11, 35-42.
- Kingsbury, S.J., Stevens, D.P., & Murray, E.J. Evaluation apprehension in verbal conditioning: A test of four subject effects models. Journal of Personality and Social Psychology, 1975, 32, 271-277.
- Kruglanski, A.W. The human subject in the psychology experiment: Fact and Artifact. In L. Berkowitz (Ed.), Advances in experimental

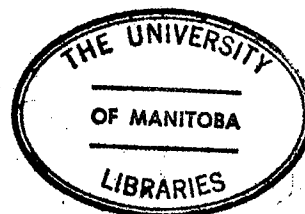
- social psychology. New York: Academic Press, 1975.
- Liebling, B.A., & Shaver, P. Evaluation, self-awareness, and task performance. Journal of Experimental Social Psychology, 1973, 9, 297-306.
- Masling, J. Role-related behavior of the subject and psychologist and its effect upon psychological data. In D. Levine (Ed.), Nebraska symposium on motivation. Lincoln: University of Nebraska Press, 1966.
- McGinley, H., Kaplan, M., & Kinsey, T. Subject effects and demand characteristics. Psychological Reports, 1975, 36, 267-278.
- Minor, M.W. Experimenter-expectancy effects as a function of evaluation apprehension. Journal of Personality and Social Psychology, 1970, 15, 326-332.
- Orne, M.T. On the social psychology of the psychological experiment: With particular reference to demand characteristics and their implications. American Psychologist, 1962, 17, 776-783.
- Orne, M.T. Demand characteristics and the concept of quasi-controls. In R. Rosenthal & R.L. Rosnow (Eds.), Artifact in behavioral research. New York: Academic Press, 1969.
- Page, M.M. Modification of figure-ground perception as a function of awareness and demand characteristics. Journal of Personality and Social Psychology, 1968, 9, 59-66.
- Page, M.M. Effects of evaluation apprehension on cooperation in verbal conditioning. Journal of Experimental Research in Personality, 1971, 5, 85-91.
- Paulus, P.B., Annis, A.B. & Reisner, H.T. An analysis of the mirror

- induced objective self-awareness effect. Bulletin of the Psychonomic Society, in press.
- Pryor, J.B., Gibbons, F.X., Wicklund, R.A., Fazio, R.H., & Hood, R. Self-focused attention and self-report validity. Journal of Personality, 1977, 45, 513-522.
- Rosenberg, M.J. When dissonance fails: On eliminating evaluation apprehension from attitude measurement. Journal of Personality and Social Psychology, 1965, 1, 28-42.
- Rosenberg, M.J. The conditions and consequences of evaluation apprehension. In R. Rosenthal & R.L. Rosnow (Eds.), Artifact in behavioral research. New York: Academic Press, 1969.
- Rosnow, R.L. & Aiken, L.S. Mediation of artifacts in behavioral research. Journal of Experimental Social Psychology, 1973, 9, 181-201.
- Rosnow, R.L., Goodstadt, B.E., Suls, J.M., & Gitter, G.A. More on the social psychology of the experiment: When compliance turns to self defense. Journal of Personality and Social Psychology, 1973, 27, 337-343.
- Sasfy, J. & Okun, M. Form of evaluation and audience expertness as joint determinants of audience effects. Journal of Experimental Social Psychology, 1974, 10, 461-467.
- Scheier, M.F., & Carver, C.S. Self-focused attention and the experience of emotion: Attraction, repulsion, elation, and depression. Journal of Personality and Social Psychology, 1977, 35, 625-636.
- Shulman, A.D., & Berman, H.J. Role expectations about subjects and experimenters in psychological research. Journal of Personality

- and Social Psychology, 1975, 32, 368-380.
- Sigall, H., Aronson, E., & Van Hoose, T. The cooperative subject: Myth or reality? Journal of Personality and Social Psychology, 1970, 6, 1-10.
- Silverman, I. Why social psychology fails. Canadian Psychological Review, 1977, 18, 353-358.
- Silverman, I. & Shulman, A.D. A conceptual model of artifact in attitude change studies. Sociometry, 1970, 33, 97-107.
- Turner, C.W., & Simons, L.S. Effects of subject sophistication and evaluation apprehension on aggressive responses to weapons. Journal of Personality and Social Psychology, 1974, 30, 341-348.
- Vallacher, R.R., & Solodky, M. Objective self-awareness, internal standards and moral behavior. Paper presented at the annual meeting of the American Psychological Association, Toronto, 1978.
- Weber, S.J., & Cook, T.D. Subject effects in laboratory research: An examination of subject roles, demand characteristics, and valid inference. Psychological Bulletin, 1972, 77, 273-295.
- Wicklund, R.A. Objective self-awareness. In L. Berkowitz (Ed.), Advances in experimental social psychology (Vol.8). New York: Academic Press, 1975.
- Yerkes, R.M., & Dodson, J.D. The relation of strength of stimulus to rapidity of habit formation. Journal of Comparative Neurology and Psychology, 1908, 18, 459-482.

Reference Note

Adair, J.G., & Spinner, B. Subjects' normative expectations for the laboratory. Unpublished manuscript, University of Manitoba, 1978.



Footnotes

1. Findings on several measures, some uninterpretable, others of little or no interest, are not reported in the text. For archival purposes these results are presented in Appendix G.
2. The reported analysis was conducted on the number of sentences which were started with a self-referencing pronoun (I or we). A second analysis carried out on the total number of sentences containing any self-reference yielded results similar to those reported above, with the exception that the experimenter by mirror interaction was no longer significant ($p < .17$). The two methods of assessing self-references were very highly correlated, $r(158) = .88$, $p < .001$.

Appendix A: Literature Review

Evidence for the Evaluation Apprehension Construct

The cueing component. Rosenberg first tested his approach to subject motivation in an examination of studies on cognitive dissonance (e.g., Festinger & Carlsmith, 1959). These studies involved giving subjects either a large or small reward for writing counterattitudinal essays, with the dependent measure being the amount of subsequent attitude change. Rosenberg (1965) reasoned that those subjects in the high reward condition were actually highly apprehensive as a result of being offered a disproportionately large reward, and were led to the hypothesis that their integrity and willingness to resist a bribe were the actual focus of the study. If subjects with this hypothesis were trying to look good, they would show little attitude change so as to demonstrate their autonomy; this would provide the results found in studies of cognitive dissonance. Subjects in the small reward condition, however, would not be led to the integrity hypothesis because the reward was not disproportionately large. They would be less resistant to attitude change. Rosenberg (1965) tested this hypothesis by separating the dissonance arousal (i.e., payment) stage of the experiment from the subsequent attitude measurement stage. Results were consistent with the hypothesis, and Rosenberg concluded that evaluation apprehension (i.e., subjects' desires to look good) and not dissonance arousal, was responsible for the results of these studies.

Subsequently, Rosenberg and other investigators proceeded to test the hypothesis that evaluation apprehension is a strong motivator of subject behavior, and a major source of artifact. Rosenberg (1969) described a number of studies that examined subjects' tendency to

respond to experimentally provided cues so as to receive a positive evaluation, under conditions of either high or low evaluation apprehension. Although there were variations in the studies carried out, both in procedure and dependent measure, the hypotheses guiding the studies were essentially the same. Typically, upon entering the laboratory subjects were given a "background information sheet" that contained the evaluation apprehension manipulations. High evaluation apprehension instructions indicated either that the task was related to psychological health, maturity or IQ, or indicated that the experimenter was interested in evaluating the personality of the subject. Low evaluation apprehension instructions (when included - most studies had only a control condition in which there was no attempt to lower evaluation apprehension) indicated that the experiment involved "some rather obscure and technical issues . . . [and there] was no interest in . . . [the subject's] unique personality" (Rosenberg, 1969, p.311), or indicated that the experimenter had no interest in either the experiment or the subjects' performance.

Embedded within or following these manipulations were the cues that indicated the response that would result in a positive evaluation. Thus some subjects were told that previous research had indicated that "X" response was associated with psychological maturity, while others were informed that "Y" response indicated the same. The large majority of these studies confirmed the cueing effect hypothesized by Rosenberg. In responding to the criterion measures, subjects given high evaluation apprehension instructions utilized the cues on how to look to a greater extent than did subjects given the low evaluation apprehension instructions; when "X" response was an indicator of maturity, subjects given the

high evaluation apprehension instructions produced "X" responses to a greater extent than did subjects in the low evaluation apprehension conditions.

These results led Rosenberg to conclude that evaluation apprehension was a pervasive motive in experiments, and depending upon the degree to which it was present, would cause subjects to try and present themselves in a positive light. In contrasting his results with those of Orne (1962), (who proposed that subjects are motivated to cooperate with the experimenter), Rosenberg stated that:

As regards the demand characteristics process posited by Orne, the present approach does inevitably raise some difficulties and disposes me toward one note of disagreement. This concerns the motivational-perceptual pattern which facilitates the subject's yielding to the experimenter's "scientific hypothesis." Where the experimenter's hypothesis is clear to the subject . . . yielding to it would be most likely to be mediated by the expectation that this will somehow bring approval or other immediate social rewards from the experimenter . . . the present studies . . . suggest that evaluation apprehension focused upon the experimenter is a more potent and more basic pattern of subject sensitivity. Thus I would hazard the hypothesis that the subject's readiness to help the experimenter make his scientific point, if experienced at all, is an instrumental stage in his search for reassuring evidence that the experimenter judges him as an acceptable or even attractively "normal" person. (Rosenberg, 1969, p.344).

Subsequent to Rosenberg's demonstration of the cueing effect and its relation to evaluation apprehension manipulations, several studies proceeded to examine the effect of evaluation apprehension on experimental behaviour, and, in particular subjects' attempts to 'look good' or avoid looking bad. Blake and Heslin (1971) exposed subjects to high or low evaluation apprehension manipulations, and then had them choose between pairs of pictures previously judged as to social desirability. Results indicated that subjects exposed to high evaluation apprehension

instructions chose the socially desirable picture of the pair more often than did those subjects in the low evaluation apprehension condition. They also found this tendency dissipated over time, so that on the last block of pictures there was no difference between the evaluation apprehension groups. These results led Blake and Heslin to conclude that increasing evaluation apprehension results in subjects utilizing the cues available in the situation to a greater extent so as to receive a positive evaluation from the experimenter.

Campbell and Hannah (1976; Hannah & Campbell, 1976), in an examination of Rokeach's value change theory, gave subjects Rosenberg's (1969) evaluation apprehension instructions and then provided them with cues indicating that mature students rated the stimulus materials either positively or negatively. Results indicated that when the cues specified change in one direction, the high evaluation apprehension group responded to them to a greater extent than did the low evaluation apprehension group. However, there was no difference between evaluation apprehension groups for the other set of cues. These results led the authors to conclude that the evaluation apprehension manipulations produced cueing effects, and that the failure to find differences in some groups were due to floor effects.

Turner and Simons (1974) also investigated the effects of evaluation apprehension on subjects' tendency to try and receive a positive evaluation. Instead of providing subjects with explicit cues, however, they utilized a task with inherent cues on how to look good; an aggression task. Results indicated that subjects exposed to the high evaluation apprehension instructions delivered fewer shocks than did those subjects in the low

evaluation apprehension conditions. Turner and Simons concluded "that a subject may inhibit his aggressive behaviour if he is concerned that his behaviour will be negatively evaluated by the experimenter" (p.346).

Thus the results of this study were also considered supportive of Rosenberg's model, and the hypothesis that high evaluation apprehension results in subjects being motivated to try to look good.

Three studies have examined the cueing effects of evaluation apprehension within the context of experimenter expectancy effects (Burkhart, 1976; Duncan, Rosenberg & Finklestein, 1969; Minor, 1970). In each of these studies, manipulations of evaluation apprehension were the same as those employed by Rosenberg. The experimental task involved having subjects evaluate the degree of success achieved by a number of people whose photographs were presented. Rather than providing explicit cues as to whether a "successful" or "unsuccessful" response was desirable, these investigators simply presented instructions that were biased in their paralinguistic demand cues. Results of two of the studies indicated that subjects in the low evaluation apprehension conditions did not perceive and/or respond to the implicit cues, and the experimenter expectancy effect was not obtained (Duncan et al., 1969; Minor, 1970). In contrast, under high evaluation apprehension conditions, subjects in both these studies responded to the implicit cues and the expectancy (i.e., cueing) effect was obtained. These studies indicate that high evaluation apprehension instructions enhance subjects' sensitivity to subtle, paralinguistic cues. The results of the study by Burkhart (1976), however, which utilized the same material employed by Duncan et al., (1969), were in opposition to those cited above; subjects administered

low evaluation apprehension instructions produced the expectancy effects, whereas those in the high evaluation apprehension condition produced reverse expectancy effects, such that those subjects given 'success' cues made 'unsuccessful' judgments, and vice versa. Although the author was able to point to several possible explanations for this unexpected result, no definite conclusions as to its cause were reached. Burkhart did conclude, however, that evaluation apprehension manipulations make subjects more sensitive and more responsive to cues in the experiment.

Several studies have been conducted with the aim of investigating the hypothesis that the apprehensive role is predominant over other roles in the laboratory, particularly the good subject role. Sigall et al., (1970) attempted to pit the apprehensive role against Orne's (1962) conception of the good subject in a study later termed crucial in a comprehensive review of the literature (Weber & Cook, 1972). Sigall et al., had two conditions in which confirmation of the experimenter's hypothesis also permitted subjects to look good. However, in the third, critical condition, these two motives were presumably put in conflict so that responding to cues on how to look good precluded subjects from confirming the experimenter's hypothesis and vice versa. Results led to the conclusion that subjects would prefer to look good when apprehensive, even if this means disconfirming the experimental hypothesis, and that the apprehensive role is predominant in experiments. Subsequent research, however, indicated that subjects had not perceived the conflict in cues intended by Sigall et. al., (Adair & Schachter, 1972; McGinley, Kaplan & Kinsey, 1975), and that when the experimenter's hypothesis is made more explicit subjects' responses are consistent with it (Adair & Schachter, 1972). It

should be noted, however, that Adair and Schachter did not conclude that subjects were exhibiting behaviour representative of the good subject role. Rather, cognizant of the conceptual and definitional problems associated with the subject role model in general, and the apprehensive role in particular, they concluded that:

It was not possible in the present study to specify whether subjects were motivated to look good or to cooperate. The confounded nature of the role attitudes underlying subject behaviour was problematic in the present study as it has been in most previous research in subject motivation (p.84).

In spite of the apparent futility involved in pitting roles against each other, other investigators have continued to pursue this line of research, attempting to demonstrate the predominance of the apprehensive role over the good subject role. Rosnow et al., (1973) had subjects participate in a study where the experimenter's hypothesis of attitude change was implicitly communicated by having subjects complete the same attitude measure before and after exposure to a communication (the demands for change being implied by the use of a pre-post measurement procedure, and the demands indicating the appropriate direction for change being included in the communication itself).

Cues for favourable self-presentation were provided by a confederate. In one condition they were congruent with the implied demands for change (the experimenter is trying to prove that high IQ people will change their opinions), while in a second condition they were apparently in conflict with the demands for change (the experimenter is trying to prove that high IQ people will not change their opinion). Rosnow et al., interpreted their results to be supportive of the apprehensive role formulation, since in both conditions responses were consistent with the

cues on how to look good, regardless of the implicit cues for change. Such conclusions must be considered with extreme caution, however, since subjects' perceptions of the experimental demands, their relative salience, and the subjects' intentions in the experiment were not assessed. For example, examination of the confederate's message, which presumably contained cues only on how to receive a positive evaluation from the experimenter, may have quite reasonably been perceived by subjects to constitute the experimental hypothesis. In delivering her message, the confederate had stated that she had heard the experimenter was trying to prove that high IQ people would (or would not) change their opinion. Responses congruent with these cues would not only allow subjects to be evaluated as intelligent, but may have also permitted them to confirm what they perceived to be the experimenter's hypothesis. Thus once again, the results of a study pitting the apprehensive role against the good role is ambiguous in its implications, and the conclusions drawn by Adair and Schachter (1972) in response to Sigall et al., (1970) are appropriate; it is impossible to tell from the results of this study if subjects were motivated to look good or to cooperate. However, the results of this study do indicate that subjects will utilize cues introduced into the experimental situation when responding.

Kingsbury et al., (1975) in an expanded replication of Page (1971) also attempted to conduct a crucial experiment that would demonstrate the predominance of the apprehensive subject role in a verbal conditioning experiment. Subjects were administered either an IQ test, an adjustment test, or a consumer survey (the latter being an evaluation apprehension control condition) before proceeding to the verbal conditioning task. They

were led to believe that there was a connection between the two phases of the experiment. It was hypothesized that when subjects perceived the verbal conditioning task to be an IQ test, they would experience evaluation apprehension and try to look good by demonstrating they had solved the contingencies; this would result in a greater 'conditioning' effect in comparison to control subjects. Those in the adjustment test condition would also have their evaluation apprehension raised, but because they would presumably see the conditioning task as some measure of how easily influenced they were, would not emit the reinforced pronoun as frequently as controls in spite of the experimental demands conveyed by the experimenter's reinforcer (Page, 1971). The results of the study confirmed the hypothesis and led Kingsbury et al., to conclude that the apprehensive role was predominant over the good role. However, alternate explanations are possible in the absence of data on subjects' perceptions of the experiment, its purpose, the meaning of the experimenter's reinforcement, and so on.

In summary, the bulk of the studies on evaluation apprehension that are relevant to the cueing component suggest that subjects respond to cues provided by the experimenter, the task, etc., and that manipulations of evaluation apprehension affect the degree to which subjects will utilize these cues. This provides partial support for Rosenberg's (1965; 1969) model of subject behaviour, and his claim heightened levels of evaluation apprehension lead subjects to attempt to obtain a positive evaluation from the experimenter.

While these cueing effects may be due to evaluation apprehension, they are also open to alternative explanation (Kruglanski, 1975). For

example, differences between high and low evaluation apprehension groups may also be due to differences in the perceived importance of the study, or differences in the perception of the experimental purpose. Critical to the confirmation of Rosenberg's (1965) model, is evidence relevant to the two other components; the expectancy component and the arousal component. Specifically, evidence is needed that indicates (a) that subjects approach the typical experiment with the expectation of being individually evaluated by the experimenter and are anxious as a result of this expectation, (b) that manipulations of evaluation apprehension affect both expectancies and anxiety in the hypothesized manner, and (c) that in the absence of either the expectancy or arousal component, cueing effects do not occur to the same extent as when both these components are present.

The expectancy component. Unfortunately, most studies of evaluation apprehension have focused on subjects' tendencies to try to perceive a positive evaluation from the experimenter, and only a few studies have investigated the expectancy and arousal components of Rosenberg's model. In regards to subjects' expectations upon entering the laboratory, Shulman and Berman (1975) asked subjects to list up to ten words or phrases that were descriptive of how they would feel and act in experiments. While the authors did not discuss the full range of responses that were received, they did mention that the two most frequent responses (by 74% and 56% of subjects, respectively) were 'cooperative' and 'interested,' reminiscent of the good or faithful, rather than the apprehensive role. Shulman and Berman subsequently constructed a 31 item scale based upon the open-ended responses, and administered it to a second sample of subjects. These subjects were asked to indicate how well each of the 31 items described how they would behave in an experiment. Results of a

principal components analysis of this scale indicated that one of the dimensions of subject behaviour was an apprehensive dimension, with adjectives such as nervous, tense, anxious, apprehensive and self-conscious defining it. Unfortunately, mean scores on the adjectives were not reported so that although it is possible to conclude that an apprehensive dimension is relevant in describing subjects' behaviour, there is no indication of how apprehensive subjects are when entering the laboratory. However, the authors did conclude that:

"...although subjects' expectations about their own behaviour can be conceptualized as lying along three dimensions, the results of the open-ended questionnaire suggest that the dimension of faithfulness, which parallels the faithful subject role, has great saliency for most subjects. Moreover, subjects' expectations lean toward one pole of this dimension (being more cooperative than uncooperative)." (p.371).

Although the results of this study are somewhat ambiguous in regards to the issue of interest, the conclusions drawn by Shulman and Berman do not suggest that subjects typically enter the experiment with the expectancy of being individually evaluated. One can only surmise that if this had been the case, the authors would have noted it in their discussion of the results. Results of a recent study (Adair & Spinner, Note 1) also have some bearing on this matter. In one condition of that study, the subjects were asked to respond to 72 adjectives in terms of how well they described subjects' feelings and behaviour in the typical experiment. Examination of the means of the variables anxious, aroused, apprehensive, try to look good, defensive, concealing, uncomfortable and threatened (all relevant to the apprehensive role) indicated that each was below the mid-point of the five-point scale, and that the average of all these means was 2.5 (where a score of two

represented "describes me slightly" and a score of three indicated "describes me somewhat"). In contrast, adjectives descriptive of the good and faithful roles, such as honest, do as well as possible, be sincere, be accurate, do what is asked, try hard, cooperative, truthful, follow instructions exactly, be correct, and be attentive, all had ratings at 3.5 or higher, and the average of all these variables was 3.9 (where a rating of 4.0 indicated "describes me well").

Studies by Epstein, Suedfeld and Silverstein (1973) and by Aiken and Rosnow (1973, cited in Rosenthal and Rosnow, 1975) also found similar results; no mention of apprehensiveness as a predominant motive, and a large number of subjects responding with adjectives such as 'honest' and 'alert'. However, subjects in Epstein et al., were asked what obligations they felt they had in the experiment and those in Aiken and Rosnow were asked what they thought was expected of them as subjects. In both cases, subjects' failure to mention apprehensiveness or attempts to look good only indicates that they do not feel obligated to be apprehensive or to try to look good in the experiment.

In summary, contrary to Rosenberg (1969), the results of these four studies do not indicate that subjects typically enter the experiment with the expectancy of being evaluated, or apprehensive, or of trying to look good. Rather, they suggest that subjects enter the typical experiment with an interest in what is going on, and the intention of doing what they are supposed to, as well as they can.

Only one experiment has investigated the expectancy component in the context of manipulations designed to affect levels of evaluation apprehension. Henchy and Glass, (1968) in a post-experimental inquiry,

found that subjects given a high evaluation apprehension manipulation felt their performance was being judged more than control subjects did. Unfortunately, Hency and Glass' manipulation of evaluation apprehension (telling subjects explicitly that an expert in perception and human learning would observe and evaluate their performance) is sufficiently different from more typical manipulations to make generalization to them difficult. Most manipulations of evaluation apprehension (e.g., Minor, 1970; Rosenberg, 1969) may imply that individual evaluation will occur, but explicitly only indicate the task is related to some important dimension of the individual (e.g., psychological adjustment, or IQ) and the purpose of the research is to investigate this relationship. They generally do not, as Hency and Glass did, explicitly state that experts will directly or by means of film, observe the subjects perform the task.

Although no other studies have directly investigated the expectancy component as a function of different levels of evaluation apprehension, several have obtained responses to measures that tapped some combination of the expectancy and arousal components. Four studies have asked subjects post-experimentally if they were concerned about their performance being evaluated. Of these, two (Hency & Glass, 1968; Rosenberg, 1969, p.312) found the appropriate differences between evaluation apprehension groups, while two (Kingsbury et al., 1975; Minor, 1970) failed to find any differences. In addition, Campbell and Hannah (1976), using a measure summing subjects' feelings of evaluation and anxiety, found no main effect differences between high and low evaluation apprehension groups. They did, however, find a marginal interaction ($p < .06$) of evaluation apprehension and direc-

tion of cueing; the two high evaluation apprehension groups and one of the low evaluation apprehension groups had approximately equal means while the remaining low evaluation apprehension group had a lower level on the summed measure.

Two studies have run quasi-control groups (Orne, 1969) as checks on levels of evaluation apprehension after checks in the major studies failed to confirm the manipulation. Kingsbury et al. (1975) after failing to confirm the manipulation in the major study had other subjects experience the evaluation apprehension manipulations and then "they were asked to give their opinion of how most college students would react to the task rather than their own personal reactions" (p.275). Results indicated that those subjects in the high evaluation apprehension conditions felt others would experience more feelings of evaluation apprehension and be more concerned about revealing inadequacies than did subjects in the low evaluation apprehension conditions. There was, however, no difference between groups in their estimation of how worried others would be about revealing inadequacies in front of the experimenter.

Rosnow et al., (1973) had subjects imagine they were participating in their major study and had them judge the degree of evaluation apprehension they would feel as real subjects. Subjects in the two evaluation apprehension conditions (manipulated by making subjects either anonymous or nonanonymous) showed the expected differences. It is interesting to note, however, that even subjects in the high evaluation apprehension condition only had a mean rating of 31.6 on a 101-point scale, where higher numbers (up to 100) indicated high evaluation apprehension.

The problem with interpreting the results of these latter studies is that they were quasi-control procedures where subjects were asked to judge how they or others would react to the real stimuli. One cannot ignore the possibility that subjects were just responding to the demand characteristics of the situation, since Orne (1969) originally devised this procedure to detect demand characteristics. At best, subjects are offering guesses as to what would occur, and so one may only conclude that their judgments of the situation are the same as those of the investigators.

In summary, there is very little evidence directly relevant to the expectancy component of Rosenberg's (1965; 1969) formulation. Furthermore, what evidence there is on the effects of evaluation apprehension manipulations tends to be weak and contradictory. Only one study (Henchy & Glass, 1968) has investigated the construct directly (albeit on a post-experimental questionnaire) and although its results were supportive, it is difficult to generalize from this study to others where evaluation apprehension was manipulated. The other study that is supportive of the expectancy component (Rosenberg, 1969) is ambiguous as to the exact nature of group differences and to the specific measure used in assessing differences.

On the other hand, studies that have failed to find support for the expectancy component are equally suspect, since the failure to reject the null hypothesis may have been due to ineffective manipulations, insensitive measures, or dissipation of evaluation apprehension over time. In addition, in each study the manipulation of evaluation apprehension affected the dependent variable regardless of the outcome of the

manipulation checks. Thus at this time no firm conclusions may be drawn regarding (a) the effects of evaluation apprehension manipulations on subjects' expectancies regarding evaluation, nor (b) the effects of differential expectancies on the cueing effect.

The arousal component. The arousal component of evaluation apprehension has been investigated somewhat more fully, and results of these studies are generally more consistent with each other. Henchy and Glass (1968) found that subjects reported themselves to be more apprehensive when being observed and evaluated by an expert audience in comparison to a non-expert audience or working alone. As indicated earlier, however, some caution must be exercised in generalizing these results to other studies. Hannah and Campbell (1976) found that subjects given high evaluation apprehension instructions reported themselves to be more nervous and anxious than those given low evaluation apprehension instructions. Rosenberg (1969, p.312) reported that subjects in a high evaluation apprehension condition reported themselves to be more anxious than did those in a low evaluation apprehension condition in one study, but not in another (p.299). Unfortunately, Rosenberg does not indicate what type of measure was used, nor does he present the data associated with these results. Geen (1974) has reported that compared to a low evaluation apprehension group, subjects in a high evaluation apprehension condition were less likely to report themselves to be relaxed. However, there was no difference in the number of subjects reporting themselves to be fearful, carefree, or jumpy in high and low evaluation apprehension conditions. Three additional studies have found no difference in self-reported anxiety of subjects administered high and low evaluation

apprehension manipulations (Innes & Young, 1975; Minor, 1970; Turner & Simons, 1974) although all three found the manipulations to have an effect on the dependent variables. Kingsbury et al. (1975), in their quasi-control procedure, similarly found no differences in subjects' estimation of how much anxiety would be aroused by the different manipulations. Finally, Burkhart (1976) found no differences in state of anxiety (as measured by Spielberger's State-Trait Anxiety Inventory) between subjects given high and low evaluation apprehension manipulations, although once again the manipulations affected the dependent variable.

These studies indicate that by and large, contrary to Rosenberg's model, typical evaluation apprehension manipulations do not arouse anxiety in subjects, and that anxiety arousal is not necessary for cueing effects to be observed. However, some caution must be exercised in drawing conclusions from these studies since most assessed anxiety some time after the evaluation apprehension instructions were administered to subjects. This point is of particular importance since Blake and Heslin (1971) have found that the cueing effects associated with evaluation apprehension dissipate over time.

Fortunately, evidence more directly relevant to the arousal component is available, and it is not subject to this criticism, nor the problems associated with self-report measures. Henchy and Glass (1968) although successful in finding group differences on self-report measures, did not find differences between their evaluation apprehension groups on either heart rate or skin conductance throughout the course of their experiment. Christensen (1977) similarly found no difference in heart rate between a control group and a group given a high evaluation appre-

hension manipulation. This pattern of no difference was found while the evaluation apprehension manipulation was being administered, as well as at the start and finish of the experimental task. Finally, Paulus, Annis and Reisner (in press) using palmar sweat as a measure of arousal, found that subjects given high evaluation apprehension instructions did not differ from a low evaluation apprehension group until after the experimental task was completed. This suggests that arousal may not occur until actual evaluation is about to take place. These results do not support the hypothesis that anxiety arousal mediates responses (i.e., the cueing effect) while the task is ongoing. It is interesting to contrast these results with those of Blake and Heslin (1971) who found that the behavioural effects of evaluation apprehension (the cueing effect) were apparent only at the start of the task and had dissipated by the time the task was over.

Combined with the results of studies obtaining self-report measures of anxiety, the studies cited above suggest that as compared to low evaluation apprehension instructions, high evaluation apprehension manipulations do not produce increased anxiety. They also indicate that a high level of anxiety is not necessary for cueing effects to be observed.

Summary

Thus, only one component of Rosenberg's (1969) three component model appears to have empirical support. While the predicted behavioural outcome occurs as a function of differential evaluation apprehension instructions, the theoretical antecedents that Rosenberg proposed have little support; subjects demonstrate the cueing effect, but this effect

does not appear to be a result of subjects' expecting to be evaluated and/or experiencing arousal. In short, there is no evidence to suggest that apprehension over evaluation is a pervasive motive in experiments. One is left with the 'descriptive' conclusion that certain manipulations influence subjects' use of cues that indicate how to do well on the task. However, the process mediating this behaviour is as yet undetermined. Clearly, some alternative theoretical formulation is required.

The Theory of Objective Self-Awareness

One such theoretical approach may be found in Duval and Wicklund's (1972; Wicklund, 1975) theory of objective self-awareness. Briefly, this theory proposes that conscious attention is dichotomous, at any one time being directed either toward the self (the state of objective self-awareness), or toward the environment (the state of subjective self-awareness). The degree to which an individual is objectively self-aware is a direct function of the proportion of a given time period spent with attention directed at the self. Any stimulus which reminds a person of his/her status as an object will encourage self-focusing, and thus increase objective self-awareness. Conversely, stimuli that draw attention toward some aspect of the environment, and away from the self tend to reduce it. Thus, seeing one's reflection in a mirror, seeing a camera directed at oneself, hearing one's own voice on a tape-recorder, and the knowledge of being attended to by others, are all stimuli that have been used to increase objective self-awareness experimentally. In investigating the validity of two of these manipulations, Davis and Brock (1975) followed the assumption that the focus of a person's attention will be reflected in verbal productions, and

assessed the number of self-referencing statements (i.e., frequency of personal pronoun use) made by subjects. Manipulations of self-awareness included the presence or absence of a camera directed at subjects (Experiment 1) and the presence or absence of a mirror in front of subjects (Experiment 2). Results indicated that the camera and the mirror both serve to increase objective self-awareness. Carver and Scheier (1978) have provided further validation for the mirror and audience presence as two manipulations of objective self-awareness using a conceptually similar task. Their study also indicated that the Self-Consciousness Scale (Fenigstein, Scheier & Buss, 1975) is a valid measure of individual differences in self-consciousness. The term self-consciousness is used to refer to a trait or the stable predisposition on the part of an individual to focus attention inward. The term objective self-awareness is used to refer to a temporary state during which attention is predominantly focused inward.

The initial reaction to the onset of objective self-awareness is hypothesized to be a self-evaluation process. During the self-evaluation process, the individual makes a comparison between the actual self and some standard or ideal on the dimension that is most salient. The discrepancy between actual and ideal is negative if the actual falls below the ideal, and is positive if the ideal is met or exceeded. If the discrepancy is negative, then the individual experiences heightened negative affect (Scheier & Carver, 1977) and will attempt to reduce the discrepancy and/or reduce objective self-awareness by avoiding stimuli that encourage it. If, on the other hand, the discrepancy is positive, then the individual experiences heightened positive affect (Scheier &

Carver, 1977) and seeks out (or at least does not avoid) stimuli that encourage self-focusing (Davis & Brock, 1974; Wicklund, 1975). Research subsequent to Duval and Wicklund's (1972) proposal of the theory has also indicated, for example, that the state of objective self-awareness results in more self-attribution, (Buss & Scheier, 1976; Duval & Wicklund, 1973) more self-serving biases in attribution (Federoff & Harvey, 1976), more self-relevant and self-evaluative cognitions (Geller & Shaver, 1976) and greater sensitivity to internal states (Gibbons, Scheier, Carver & Hormuth, in press).

In order to investigate the possibility of a relationship between manipulations of evaluation apprehension and objective self-awareness, it is necessary to address two issues: (1) the possibility of a systematic relationship between manipulations of evaluation apprehension and subjects' state of self-awareness, and (2) the relationship between changes in self-awareness and the effects previously attributed to changes in levels of evaluation apprehension.

Evaluation apprehension and self-awareness. Levels of evaluation apprehension have been manipulated almost exclusively by the use of differential instructions. If manipulations of evaluation apprehension do indeed effect the state of self-awareness, then the component that affects self-awareness must be found in those instructions. For this reason, it is useful to examine the instructions used to manipulate evaluation apprehension, and try to relate them to objective self-awareness on a conceptual level.

Since Rosenberg's (1965; 1969) model of evaluation apprehension has served as the basis for research in the area, an example will be drawn from his work. In one study, where subjects were required to rate

the amount of success achieved by people depicted in a series of photographs (Rosenberg, 1969, pp.311-312), subjects in the high evaluation apprehension condition were told:

"these photographs comprise a recently developed Test of Psychological Maturity. The pattern of responses given to these photographs by psychologically mature undergraduate students have been shown to be significantly different from the responses of those manifesting psychological maladjustment." The communication went on to assert that our research was pointed toward the further development of the picture rating test as an "instrument for picking out from the large college population those students who would be judged inadequate in their emotional adjustment or generally prone to psychological disorders."

Subjects in this condition presumably also felt that they were not anonymous and could be identified by the experimenter.

In contrast, those subjects exposed to the low evaluation apprehension manipulation were told the investigators were:

"interested in integrating the various dimensions or factors involved in social perception processes into a more simplified model by a method which statisticians term 'stochastic inferential mathematical modeling'." . . . a further paragraph informed the subject that: "the photo ratings for all participants will be considered as a group and an overall average score and statistical estimate of distribution variance will be obtained for this set of photographs."

It is of interest to note that these were the only manipulations of evaluation apprehension reported by Rosenberg (1969) [out of 10 studies] where post-experimental data indicated the manipulations were effective. Several features of these instructions are of interest. For instance, it is clear that the high evaluation apprehension instructions made salient the fact that observation and evaluation would be taking place on the individual level, and that the individual was the focus of attention in the study. In addition, these instructions made salient the dimension that would be evaluated, and the possibility that subjects could do poorly (i.e., experience a negative discrepancy). In contrast the low

evaluation apprehension manipulation emphasized that observation would occur on a group level, and that group results, rather than individual, would be the focus of attention. In addition, no particular dimension of evaluation was made salient, and the possibility of failure not introduced.

From a theoretical perspective, it seems likely that these instructions would result in different states of self-awareness. Wicklund (1975) has noted that "the knowledge of being attended to by others should . . . create a set towards self-observation . . . the self readily comes to the fore when the person realizes that the attention of the audience is on some feature of the self (p.234)." In addition, Duval and Wicklund (1972), in commenting on the experimenter-subject relationship have also indicated that in most experiments some objective self-awareness would be likely to occur since:

. . . the E exerts considerable control over the S's behaviour.
 . . . In general, we would argue that this control of the S's behaviour implies to the S that he is an object in the world and is thus a strong stimulus to objective self-awareness . . . Additional self-awareness producing aspects of the S-E relationship are the E's direct and indirect observational roles . . . Since being aware of direct or indirect observation is a stimulus to objective self-awareness, the E's visual presence and role as a monitor actually act to make the S more self-conscious. (p.29).

These statements all suggest that Rosenberg's (1969) method of arousing or decreasing evaluation apprehension should affect levels of objective self-awareness, such that those subjects administered high evaluation apprehension instructions become more self-aware than those administered low evaluation apprehension instructions. Some support for this hypothesis may also be found in Duval and Wicklund's (1972) examination of evaluation apprehension within the context of social facilitation

theory. Duval and Wicklund have argued that the manipulations of evaluation apprehension used in studies of social facilitation (e.g., Henchy & Glass, 1968) would be expected to affect levels of objective self-awareness, and that the effects of these manipulations on the dependent measures (e.g., the emission of dominant and subordinate responses) were also amenable to this interpretation.

In an attempt to pursue this hypothesis further, Liebling and Shaver (1973) used the theory of objective self-awareness as a foundation for studies on test anxiety and those on social facilitation effects. They manipulated evaluation apprehension by telling some subjects that the prose copying task they were to complete was a measure of IQ, and that their results on the dependent measure would be correlated with their overall grade point average and their marks in language classes. Subjects in the low evaluation apprehension conditions were told that the prose copying task was part of a pilot study designed to standardize the materials. Objective self-awareness was manipulated by varying whether subjects were in front of a mirror or not while performing on the last five minutes of the ten-minute task. The dependent measure was the increase in the number of letters copied from the first block to the second block.

Results indicated that the two independent variables interacted, such that the greatest increment in performance was noted when subjects had received high evaluation apprehension instructions and were not exposed to a mirror, while the smallest increment was obtained when subjects were administered low evaluation apprehension instructions and were not exposed to the mirror. The two means for the mirror conditions

were between these two extremes, and did not differ from each other. Thus, the presence of a mirror, alone, and high evaluation apprehension instructions alone, both caused performance increments as compared to when neither was present, with the evaluation apprehension manipulation being more potent. However, the effects of these two variables were not additive, so that having the mirror and high evaluation apprehension resulted in a performance decrement as compared to the high evaluation apprehension instructions alone.

Liebling and Shaver concluded that high evaluation apprehension instructions increased levels of objective self-awareness, and that the combination of the mirror and high evaluation apprehension led to extreme self-awareness which was debilitating on performance type tasks "because to the extent that a person is objectively self-aware he is necessarily paying less attention to the task" (p.303).

Unfortunately, Liebling and Shaver's conclusions regarding the relationship of evaluation apprehension and subjects' state of self-awareness must remain tentative, since no direct measure of objective self-awareness was obtained in the study. It is interesting to note that Wicklund, (1975) in commenting upon this research, stated that the results implied that the high evaluation apprehension condition would produce a set that would make for increased self-focused attention.

Finally, Carver and Scheier (1978) have demonstrated that the presence of an audience (a confederate portrayed as a psychology graduate student) waiting with the subject in order to observe performance in a later part of the experiment, increased objective self-awareness on the part of subjects. This was not a manipulation of evaluation

apprehension per se, since the confederate was not evaluating the subjects' performance while the measure of self-consciousness was being completed. However, a component that was conceptually similar to those of evaluation apprehension manipulations may have been present, since the subject was expecting the confederate to observe (and presumably evaluate) her in the immediate future. Carver and Scheier offer some convincing arguments suggesting that drive-based interpretations (i.e., interpretations based on evaluation apprehension) are not viable in explaining the effects of the mirror manipulation on measures of objective self-awareness, and by extension, the effects of audiences on measures of objective self-awareness. Thus, the results of this study suggest that evaluation apprehension manipulations such as those used in the subject motivation literature, may actually cause changes in levels of objective self-awareness while the reverse is unlikely.

Self-awareness and the cueing effect. The second issue that must be addressed in investigating the relationship between the state of self-awareness and evaluation apprehension, is whether changes in the former can account for the results of studies purporting to investigate the latter. If the theory of objective self-awareness is to provide a viable alternative to the apprehensive subject concept, then it must be able to account for the results of these studies. As has been discussed earlier, the most common result found in studies of evaluation apprehension is that compared to subjects given low evaluation apprehension instructions, those given high evaluation apprehension instructions are more sensitive to the presence of cues that indicate how to obtain a favourable evaluation (i.e., cueing effects; e.g., Blake & Heslin, 1971;

Campbell & Hannah, 1976; Hannah & Campbell, 1976; Minor, 1970; Rosenberg, 1969).

The theory of objective self-awareness suggests an alternative explanation for these results if one proceeds on the assumption that manipulations intended to increase levels of evaluation apprehension in fact make the individual more self-aware. The key difference between these approaches is that the evaluation apprehension model puts the emphasis on concern over evaluation by the experimenter, while the objective self-awareness approach focuses on self-evaluation and its consequences.

As was indicated earlier, Duval and Wicklund (1972; Wicklund, 1975) have proposed that the initial consequence of increased self-awareness is self-evaluation on the dimension that is salient. This self-evaluation takes the form of the comparison of one's actual standing on the salient dimension to some ideal or standard that may be held internally or imposed from external sources. If the result of this self-evaluation process is negative, and the actual does not meet the standard, then a negative affective reaction, accompanied by attempts to avoid self-awareness and/or reduce the discrepancy, will result. In the typical evaluation apprehension study, it is reasonable to assume that subjects are unable to avoid stimuli that cause self-awareness (short of leaving the experiment prematurely) since the experimenter and/or the experimental task are those stimuli. The subject has only one response alternative; reduction of the discrepancy. This may be accompanied by either lowering standards, or by altering performance so that it approaches the standard. This latter course may be undertaken with relative ease

when cues on how to do well on the task are provided by the experimenter. This would result in the cueing effect found in studies of evaluation apprehension. For example, it is likely that when subjects are told that the purpose of an experiment is to investigate their mental health, self-awareness is induced and a self-evaluation process is initiated. This self-evaluation process would likely result in a negative discrepancy, with the subject concluding (or at least worrying) that (s)he is not as psychologically healthy as the ideal. The subject then hears (typically from the experimenter) that response 'X' is associated with good psychological health. Being unable to reduce self-awareness, it is likely that subjects would take the only course open to them to escape the negative affect; reduce the discrepancy between actual and ideal by producing responses that are indicative of good mental health. Thus, one would expect in this case an increase in the emission of 'X' responses. In referring to the literature on social facilitation effects in general, and the study of Henchy and Glass (1968), in particular, Duval and Wicklund have noted that once a subject:

becomes objectively self-aware with respect to his task performance he will attempt to reduce the discrepancy between his aspirations and his current performance; that is, as objective self-awareness increases, the individual will show increasing efforts to improve his task performance. . . . The person who is in the presence of others will at least exert more effort to attempt to reach a standard of correctness, and if effort, persistence or motivation to be correct were to be measured, the theory definitely predicts that objective self-awareness will lead the person to try to narrow the gap between ideal (correct) performance and actual performance. (p.160).

Statements such as these strongly suggest that the cueing effect typically attributed to increased evaluation apprehension, may be reinterpreted to result from increases in objective self-awareness. At

this point it is useful to examine in more detail two studies that have been considered evidence for the apprehensive subject construct, and have parallels in the literature on objective self-awareness.

Turner and Simons (1974) in an investigation of Berkowitz's weapons effect hypothesis, found that high evaluation apprehension instructions resulted in a decrease in the number of shocks that subjects delivered to a confederate. This finding was attributed to subjects' desire to receive a favourable evaluation from the experimenter; lower aggression being associated with a more favourable evaluation. These results parallel those of Fenigstein and Buss (1974) who found that when nonaggression was the salient standard for subjects, increasing objective self-awareness by means of a mirror or the presence of an audience led to a decrease in the number of shocks delivered to a confederate. It is also of interest to note that in discussing their results, Turner and Simons (1974) suggested that the low evaluation apprehension condition may have produced deindividuation by leading subjects to believe that responses were not individually identifiable. Wicklund (1975) has related the process of deindividuation to objective self-awareness, suggesting that it is a method of preventing objective self-awareness. Thus, it seems reasonable to suggest that Turner and Simon's manipulations, intended to vary levels of evaluation apprehension, were in fact affecting objective self-awareness, and that their results are consistent with an interpretation based on the latter.

It is also useful to examine one of the studies that was intended to provide conclusive evidence that evaluation apprehension is predominant over the good subject role. Kingsbury et al. (1975) conducted a study in which subjects were led to believe that the verbal conditioning task

they were completing was related to a test of intelligence, a test of adjustment, or a consumer survey (control condition). Kingsbury et al. hypothesized that when subjects were led to believe that the task was a measure of intelligence, they would emit the reinforced pronoun more frequently than controls in an attempt to look good by demonstrating they had solved the contingencies. In contrast, it was predicted that when subjects thought the verbal conditioning task was related to the test of adjustment, they would emit the reinforced pronoun less frequently than controls due to 'defensive constriction.' Results confirmed their predictions.

This study is of particular importance in reference to objective self-awareness since the reinforced pronoun was the pronoun "I." This measure is very similar to those used to assess levels of objective self-awareness. For example, Davis and Brock (1975) used frequency of emission of personal pronouns as their measure of self-awareness in a task where subjects were to try and deduce the meaning of pronouns printed in a foreign language. The independent variables they examined were levels of objective self-awareness and nature of feedback regarding success. It is of interest to examine the relevant hypotheses of Davis and Brock (which were confirmed) as well as their reasoning in choice of a dependent measure, and apply them to the study by Kingsbury et al. Davis and Brock chose their dependent measure on the assumption that the focus of a person's attention would be reflected in his verbal productions; to the extent that a person's attention is focused inward, that person should produce statements that contain a relatively large number of self-references. Davis and Brock also hypothesized that people who

have received negative feedback (and experience a salient negative discrepancy) would attempt to avoid self-awareness and thus demonstrate a decrease in their use of personal pronouns. In contrast, those subjects who have received positive feedback (and experience a positive discrepancy) would attempt to maintain or increase self-awareness, and thus have a high level of personal pronoun use.

In applying this reasoning to the study of Kingsbury et al., it is useful to consider the IQ and adjustment conditions separately. When subjects perceived the verbal conditioning task to be a measure of IQ, it seems reasonable to assume that those subjects who had identified the contingencies (i.e., were classified as aware) would be in a state of objective self-awareness and would experience a positive discrepancy. These subjects would be comparable to the objective self-awareness/positive feedback subjects of Davis and Brock. Their increased emission of personal pronouns would permit them to indicate they had solved the problem, and at the same time would increase or maintain objective self-awareness and the positive affect associated with it (Davis & Brock, 1975). Thus an objective self-awareness interpretation of the IQ condition of Kingsbury et al. would result in the prediction that subjects would seek to increase levels of objective self-awareness (or maintain an already high level), and as a consequence, increase their emission of personal pronouns. In contrast, when subjects thought the verbal conditioning task was a measure of adjustment, it is likely that a negative discrepancy would result, (since subjects would not know how to be successful on the task) and that this in turn would lead subjects to attempt to reduce objective self-awareness; this latter purpose would be

most effectively accomplished by decreasing the use of personal pronouns and avoiding reinforcement. These are the results obtained by Kingsbury et al. (1975) when comparisons were made with the control condition. For subjects in the IQ test condition, the difference in the mean number of "I" responses produced during the 20 baseline trials and the last block of 20 (reinforced) trials, was 11.1. The same comparison for subjects in the control condition was 7.6, and for the adjustment test condition, 3.5. Thus, the results of this study as well as those discussed earlier, suggest that the theory of objective self-awareness may be a viable alternative to the concept of evaluation apprehension.

Appendix B: Instructions Major Study

Instructions

(Delivered by tape recorder)

The study you are participating in today involves the collection of some survey data. Your task today is called a sentence construction task. On the desk in front of you, you will find a pencil, some paper, and a stack of 61 cards turned face down. Once the experiment begins, the cards are to be turned over one at a time. On each card is a past-tense verb and six pronouns. Your task will be to construct and write down a sentence that begins with one of the pronouns, and uses the verb on the card. Do not think about the sentence for too long; just write down the first sentence that comes into your mind.

Now turn over the first card. This card will be used to give you an example. On that card, you can see the past-tense verb "ate," and the six pronouns, "we, they, I, he, you, and she." The sentence for this card should start with one of the pronouns, whichever one you prefer, and should use the verb on the card; in this case the verb "ate." So, for this example, you might write down the sentence, "he ate the apple." Or, you might write "we ate supper at my house."

For the subject assigned to the high evaluation apprehension instructions condition, the tape continued:

Now that you have received the instructions for the sentence construction task, we'd like to give you some background on our research and on the task. The sentence construction task comprises a recently developed test of general intelligence. Previous research

in both the United States and Canada has established that responses to the sentence construction task are related to scores on other tests of general intelligence, and to scores on timed tests of mental ability. Previous research has also indicated that those individuals who are suited for university education respond significantly differently from those not suited for university education. Our research today is pointed toward the further development of the sentence construction task as a measure of intelligence and as an instrument for picking out from the university population those individuals who would be considered unsuitable for university training and degrees. In order to accomplish this we will be comparing your results on the sentence construction task to your marks in your psychology class and to your overall GPA. For this reason we would like you to put your full name, and if known, your student I.D. number, on all experimental materials. You may rest assured that your performance today will have no effect at all on your grade in psychology or on your standing as a student. Subjects in the low evaluation apprehension instructions condition were told:

Now that you have received the instructions for the sentence construction task, we'd like to give you some background on our research and on the task. Our interest in the sentence construction task involves integrating the various dimensions or factors involved in temporal-linguistic expressive processes into a more simplified model. This will be accomplished through a method which statisticians call 'stochastic-inferential mathematical modeling.'

Previous research conducted in both the United States and Canada, has already indicated some of the factors that may be involved. Our research today is pointed toward the further development of mathematical formulae and sampling distributions that will describe the nature of the processes we are interested in. Please do not put your name or any other identification on any of the experimental materials. Our interest is in examining group responses to the sentence construction task, and group average for this population. After receiving one set of evaluation apprehension instructions, the subject in the cues condition was told (via the tape recording):

You should have no trouble finishing the sentence construction task within the time limits of the experiment. Although most people in the general population task as much as 40 to 50 minutes to complete the task, university students usually require no more than 30 minutes, and some are able to complete the task in as little as 15 minutes.

For the subject in the no cues condition, these latter instructions were omitted. After ascertaining that the subject has understood the instructions, the experimenter asked the subject to complete the remaining 60 cards.

Appendix C: Post-Experimental Questionnaire

SUBJECT QUESTIONNAIRE*

Instructions

At this point in this experiment, we would like to get your ideas and thoughts about what you have done up until now. Please answer each of the following questions frankly and honestly. Please do not go on to the next question until you have completed your answer to the previous one, and please do not go back to a question once you have started the next one. Please turn over the pages one at a time.

1. Please indicate on each of the scales below, how you felt during the experimental task. Indicate how you felt by placing a check mark on each scale at the point that best represents how you felt. (For example, if the scale was marked 'very warm' on one side and 'very cold' on the other, and you felt very warm, you would do this:

very warm ☒ — — — — — very cold

If you felt very cold you would do this:

very warm — — — — — ☒ very cold

If you were somewhere between these two extremes, you would check the spot that best represents how you feel, e.g., mildly cold:

very warm — — — — — ☒ — — — — — very cold

Now complete the scales below:

(a) very anxious — — — — — not at all anxious

(b) very self-conscious — — — — — not at all self-conscious

- (c) very cooperative _____ not at all cooperative
- (d) very uncomfortable _____ not at all uncomfortable
- (e) very apprehensive _____ not at all apprehensive
- (f) like I was being _____ not like I was being
evaluated evaluated
- (g) very defiant _____ not at all defiant
- (h) very concerned over _____ not at all concerned over
how I would do how I would do

2. A person's behaviour in any situation may be influenced by several things. Please indicate on the scales below, how much you think each of the following influenced your responses on the sentence construction task.

- (a) The type of person you are.

very much _____ very little

- (b) The type of person the experimenter is.

very much _____ very little

- (c) The nature of the task itself.

very much _____ very little

- (d) How any person in a psychological experiment is supposed to act.

very much _____ very little

3. At the beginning of the sentence construction task, how well did you expect to do?

I expected to do _____ I expected to do
very poorly very well

4. While you were doing the sentence construction task, how well did you think you were doing?

very poorly _ _ _ _ _ very well

5. (a) What do you think the purpose of this experiment is?
(b) When did this first occur to you?
6. (a) Do you think the experimenter wanted you to make up your sentences in any particular way?
(b) If yes, in what way?
(c) When did this first occur to you?
7. (a) Do you think you were supposed to use some of the pronouns more than others?
(b) If yes, which ones do you think you were supposed to use more?
(c) When did this first occur to you?
8. (a) Do you think you were deceived (i.e., not told the truth) in this experiment?
(b) If yes, exactly what do you think you were being deceived about?
(c) When did this first occur to you?

9. (a) Do you think the mirror had any purpose in the experiment?
(b) If yes, what purpose?
(c) When did this first occur to you?
10. (a) Have you heard or read of this sort of experiment before?
(b) If yes, exactly what did you hear or read?

* Each question originally on a separate sheet.

Appendix D: Statistical Tables

Table 6

Summary Table for Analysis of Variance on Personal Pronoun Measure (Collapsed Across Trials), and for MANOVA on Blocks of (20) Trials.

| Source | Across Trials | | Between Trials | | SDW's | |
|----------------|---------------|------|----------------|------|------------|----------------|
| | F | P | F | P | Block(1-2) | Block(1+2/2)-3 |
| Grand Mean | - | - | 2.06 | .13 | 0.98 | 0.17 |
| Contrast 1 | 0.10 | .75 | 0.24 | .79 | 1.00 | 0.02 |
| Contrast 2 | 0.66 | .42 | 0.28 | .76 | 0.92 | -0.40 |
| Contrast 3 | 1.33 | .25 | 0.09 | .91 | 0.59 | 0.79 |
| Contrast 4 | 0.13 | .72 | 0.33 | .72 | -0.36 | 0.94 |
| Contrast 5 | 0.13 | .72 | 0.39 | .68 | 0.64 | 0.76 |
| Contrast 6 | 1.88 | .17 | 3.02 | .052 | 0.22 | 0.97 |
| Contrast 7 | 4.63 | .033 | 2.09 | .13 | -0.07 | 1.00 |
| Sex (D) | 1.44 | .23 | 0.97 | .38 | 0.71 | 0.69 |
| Experiment (E) | 0.12 | .73 | 0.14 | .87 | 0.90 | 0.41 |
| 1 x D | 0.19 | .66 | 0.21 | .81 | 0.81 | 0.57 |
| 2 x D | 0.03 | .86 | 2.65 | .07 | 0.99 | -0.17 |
| 3 x D | 0.05 | .83 | 0.34 | .71 | 0.82 | 0.56 |
| 4 x D | 0.90 | .34 | 0.17 | .85 | 1.00 | 0.01 |
| 5 x D | 0.65 | .42 | 0.11 | .90 | 0.99 | -0.14 |
| 6 x D | 4.72 | .032 | 0.45 | .64 | 0.94 | -0.36 |
| 7 x D | 0.04 | .83 | 0.42 | .66 | -0.23 | 0.98 |
| 1 x E | 5.43 | .021 | 2.89 | .06 | 0.64 | 0.75 |
| 2 x E | 3.03 | .08 | 0.25 | .78 | 0.97 | -0.25 |
| 3 x E | 0.17 | .68 | 0.55 | .58 | -0.47 | 0.89 |
| 4 x E | 0.02 | .88 | 0.00 | 1.00 | -0.33 | 0.95 |
| 5 x E | 0.90 | .34 | 0.11 | .90 | 0.99 | -0.14 |
| 6 x E | 0.06 | .80 | 0.77 | .47 | 0.59 | 0.79 |
| 7 x E | 0.04 | .83 | 0.42 | .66 | -0.23 | 0.98 |
| D x E | 0.02 | .90 | 0.20 | .82 | -0.02 | 1.00 |
| 1 x D x E | 0.54 | .46 | 0.02 | .98 | 0.86 | -0.53 |
| 2 x D x E | 0.17 | .68 | 0.20 | .82 | 0.76 | -0.67 |
| 3 x D x E | 0.27 | .61 | 1.49 | .23 | 0.56 | 0.82 |
| 4 x D x E | 0.44 | .51 | 1.42 | .25 | 0.99 | -0.10 |
| 5 x D x E | 0.34 | .56 | 0.38 | .68 | 0.43 | 0.89 |
| 6 x D x E | 0.22 | .64 | 1.06 | .35 | -0.97 | 0.28 |
| 7 x D x E | 0.28 | .60 | 1.12 | .33 | -0.21 | 0.98 |

Note. Degrees-of freedom for univariate analysis are 1 and 128; for multivariate analysis, 2 and 127.

See Table 2 for Contrasts.

Table 7

Summary Table for Analysis of Variance on Speed of Performance Measure.

| Source | F | p |
|-------------------|-------|-------|
| Mirror (A) | 21.41 | .12 |
| Eval. App. (B) | 12.24 | .0007 |
| Cues (C) | 3.23 | .075 |
| Subject Sex (D) | 2.81 | .10 |
| Experimenter (E) | 0.02 | .89 |
| A x B | 3.35 | .07 |
| A x C | 2.96 | .09 |
| A x D | 0.03 | .87 |
| A x E | 1.81 | .18 |
| B x C | 0.16 | .69 |
| B x D | 0.14 | .71 |
| B x E | 0.04 | .84 |
| C x D | 0.00 | .96 |
| C x E | 0.01 | .92 |
| D x E | 0.43 | .51 |
| A x B x C | 0.01 | .93 |
| A x B x D | 0.00 | 1.00 |
| A x B x E | 0.29 | .59 |
| A x C x D | 0.16 | .69 |
| A x C x E | 0.10 | .75 |
| A x D x E | 0.60 | .44 |
| B x C x D | 0.02 | .88 |
| B x C x E | 0.49 | .49 |
| B x D x E | 0.06 | .81 |
| C x D x E | 0.51 | .48 |
| A x B x C x D | 0.37 | .54 |
| A x B x C x E | 0.00 | 1.00 |
| A x B x D x E | 0.00 | .98 |
| A x C x D x E | 3.47 | .06 |
| B x C x D x E | 1.44 | .23 |
| A x B x C x D x E | 2.31 | .13 |

Note. Degrees-of-freedom for each hypothesis were 11 and 128.

Table 8

Summary Table for MANOVA on Attributions to the Self, Experimenter (Er), Task and Subject Role (SR), and Univariate Significance for Self-Attributions.

| Source | F | p | SDW's | | | |
|-------------------|------|------|--------|-------|-------|-------|
| | | | Self | Er | Task | Sr |
| Mirror (A) | 1.77 | .14 | -0.22 | -0.66 | -0.64 | 0.10 |
| Eval. App. (B) | 0.58 | .68 | 0.91 | -0.42 | -0.22 | -0.31 |
| Cues (C) | 1.10 | .36 | -0.03 | -0.80 | -0.50 | -0.05 |
| Subject Sex (D) | 0.54 | .71 | -0.85 | 0.68 | -0.06 | 0.02 |
| Experimenter (E) | 1.52 | .20 | 0.83** | -0.34 | -0.32 | 0.49 |
| A x B | 2.71 | .03 | 0.02 | -0.27 | -0.95 | 0.02 |
| A x C | 0.50 | .74 | 0.84 | -0.21 | -0.62 | 0.19 |
| A x D | 1.54 | .19 | 0.22 | 0.58 | -0.35 | -0.70 |
| A x E | 0.90 | .47 | -0.16 | -0.31 | -0.95 | 0.41 |
| B x C | 1.73 | .15 | 0.34 | -0.52 | -0.20 | -0.71 |
| B x D | 1.09 | .37 | 0.12 | -0.44 | -0.81 | -0.15 |
| B x E | 0.99 | .41 | 0.72 | 0.25 | -0.68 | -0.07 |
| C x D | 0.35 | .85 | 0.60 | 0.27 | -0.68 | -0.31 |
| C x E | 1.09 | .37 | -0.02 | -0.04 | -0.68 | 0.97 |
| D x E | 0.54 | .71 | 0.86 | 0.38 | -0.08 | -0.35 |
| A x B x C | 2.18 | .007 | 0.47* | -0.01 | 0.06 | 0.80 |
| A x B x D | 1.73 | .15 | 0.06 | -0.13 | -0.91 | -0.19 |
| A x B x E | 2.31 | .06 | -0.52 | 0.29 | -0.83 | 0.50 |
| A x C x D | 0.87 | .48 | -0.78 | -0.29 | -0.22 | -0.22 |
| A x C x E | 1.52 | .20 | 0.38 | 0.76 | -0.54 | -0.07 |
| A x D x E | 1.08 | .37 | -0.43 | -0.31 | -0.80 | 0.56 |
| B x C x D | 0.08 | .99 | 0.40 | -0.50 | -0.74 | 0.62 |
| B x C x E | 0.43 | .79 | 0.30 | 0.34 | -0.95 | 0.11 |
| B x D x E | 0.30 | .88 | 0.20 | -0.75 | -0.65 | 0.46 |
| C x D x E | 0.30 | .87 | -0.67 | 0.16 | -0.13 | -0.62 |
| A x B x C x D | 0.28 | .89 | -0.04 | 0.53 | -0.41 | -0.71 |
| A x B x C x E | 0.86 | .49 | 0.31 | 0.47 | -0.51 | 0.72 |
| A x B x D x E | 1.63 | .17 | -0.57* | -0.57 | 0.10 | -0.40 |
| A x C x D x E | 1.14 | .34 | -0.70 | 0.31 | -0.36 | 0.70 |
| B x C x D x E | 1.44 | .22 | -0.54 | 0.85 | -0.03 | -0.40 |
| A x B x C x D x E | 1.83 | .13 | 0.73 | -0.55 | 0.16 | -0.60 |

Note. Degrees-of-freedom for each hypothesis were 4 and 125.

* $p < .10$

** $p < .05$ (degrees-of-freedom = 1,128 for univariate test).

Table 9

Summary Table for MANOVA on Measures of Anxiety, Apprehensiveness, (Appr),
Concern over performance (Concern) and Feelings of Evaluation (Evaluated).

| Source | SDW's | | | | | |
|-------------------|-------|------|---------|-------|---------|-----------|
| | F | p | Anxiety | Appr | Concern | Evaluated |
| Mirror (A) | 3.27 | .014 | -0.38 | 0.27 | -0.22 | 1.00 |
| Eval. App. (B) | 3.18 | .016 | -0.06 | 0.05 | -0.56 | -0.64 |
| Cues (C) | 0.36 | .83 | -0.41 | -0.53 | -0.34 | 0.84 |
| Subject Sex (D) | 0.65 | .63 | -0.20 | -0.47 | -0.22 | 1.04 |
| Experimenter (E) | 0.92 | .46 | -0.11 | 0.21 | -1.08 | 0.59 |
| A x B | 2.70 | .034 | -0.65 | 1.07 | 0.12 | -0.53 |
| A x C | 0.98 | .42 | 0.77 | -0.03 | -0.78 | 0.31 |
| A x D | 1.81 | .13 | 0.52 | -1.02 | 0.08 | -0.34 |
| A x E | 0.71 | .59 | -0.05 | 1.06 | -0.42 | -0.21 |
| B x C | 0.78 | .54 | -0.11 | -0.50 | -0.63 | -0.09 |
| B x D | 0.52 | .72 | -0.55 | 0.33 | -0.38 | -0.64 |
| B x E | 0.84 | .50 | -0.49 | -0.16 | 0.09 | -0.71 |
| C x D | 1.06 | .38 | -0.16 | 0.59 | -0.77 | 0.77 |
| C x E | 1.09 | .36 | -0.45 | -0.39 | -0.01 | 0.93 |
| D x E | 2.19 | .07 | 0.63 | 0.50 | -0.40 | -0.45 |
| A x B x C | 1.46 | .22 | 0.07 | -0.17 | -0.84 | -0.22 |
| A x B x D | 2.31 | .06 | -0.07 | 0.56 | -0.52 | 0.83 |
| A x B x E | 1.22 | .30 | 0.05 | -0.93 | -0.38 | 0.40 |
| A x C x D | 0.61 | .66 | 0.62 | -0.45 | -0.87 | 0.27 |
| A x C x E | 0.29 | .88 | -1.02 | 0.92 | 0.02 | -0.19 |
| A x D x E | 0.09 | .98 | -0.92 | -0.16 | -0.13 | 0.36 |
| B x C x D | 3.56 | .009 | 0.23 | -0.08 | -0.73 | 0.99 |
| B x C x E | 1.36 | .25 | -0.49 | 0.10 | -0.42 | -0.56 |
| B x D x E | 2.23 | .07 | -0.41 | 0.42 | -0.45 | -0.68 |
| C x D x E | 4.29 | .003 | -0.12 | -0.27 | 0.02 | 1.04 |
| A x B x C x D | 1.80 | .13 | 0.00 | -0.93 | -0.13 | -0.08 |
| A x B x C x E | 0.46 | .76 | -0.95 | 0.76 | -0.55 | 0.28 |
| A x B x D x E | 0.44 | .78 | 0.76 | 0.41 | -0.16 | -0.44 |
| A x C x D x E | 0.88 | .48 | 0.22 | -0.65 | -0.27 | 1.01 |
| B x C x D x E | 0.70 | .61 | 0.36 | 0.74 | 0.03 | -0.70 |
| A x B x C x D x E | 0.39 | .82 | 0.88 | -0.87 | 0.03 | -0.38 |

Note. Degrees-of-freedom for each hypothesis were 4 and 125.

Table 10

Summary Table for MANOVA on Measures of Retrospective Expected and Achieved Success

| Source | <u>F</u> | <u>p</u> | <u>SDW's</u> | |
|-------------------|----------|----------|--------------|----------|
| | | | Expected | Achieved |
| Mirror (A) | 0.99 | .37 | -0.14 | 1.06 |
| Eval. App. (B) | 0.61 | .55 | 1.04 | -0.09 |
| Cues (C) | 0.24 | .78 | 0.32 | 0.81 |
| Subject Sex (D) | 4.15 | .018 | 0.56 | 0.61 |
| Experimenter (E) | 0.43 | .65 | 1.00 | 0.00 |
| A x B | 1.33 | .27 | 0.98 | 0.03 |
| A x C | 0.05 | .95 | -0.90 | 1.01 |
| A x D | 0.99 | .37 | -0.14 | 1.06 |
| A x E | 0.15 | .86 | -0.07 | 1.03 |
| B x C | 0.45 | .64 | -1.07 | 0.81 |
| B x D | 0.75 | .47 | -0.85 | 1.09 |
| B x E | 0.42 | .66 | -0.03 | 1.01 |
| C x D | 2.98 | .054 | 0.64 | 0.53 |
| C x E | 0.44 | .65 | 1.06 | -0.16 |
| D x E | 1.85 | .16 | -0.58 | 1.12 |
| A x B x C | 0.38 | .68 | 1.12 | -0.58 |
| A x B x D | 0.33 | .72 | -0.22 | 1.08 |
| A x B x E | 0.09 | .92 | 0.77 | 0.37 |
| A x C x D | 0.01 | .99 | -0.90 | 1.01 |
| A x C x E | 0.87 | .42 | -0.27 | 1.09 |
| A x D x E | 0.24 | .78 | -0.32 | 1.10 |
| B x C x D | 0.53 | .59 | 0.52 | 0.65 |
| B x C x E | 2.46 | .09 | -0.76 | 1.09 |
| B x D x E | 0.62 | .54 | 0.90 | 0.19 |
| C x D x E | 0.84 | .43 | -0.19 | 1.07 |
| A x B x C x D | 0.74 | .48 | 1.09 | -0.25 |
| A x B x C x E | 0.42 | .66 | -0.03 | 1.01 |
| A x B x D x E | 1.21 | .30 | -0.24 | 1.09 |
| A x C x D x E | 0.12 | .89 | 0.89 | 0.21 |
| B x C x D x E | 0.70 | .50 | -0.24 | 1.09 |
| A x B x C x D x E | 1.17 | .31 | 0.12 | 0.94 |

Note. Degrees-of-freedom for each hypothesis were 2 and 127.

Table 11

Summary Table for Analysis of Variance on Measure of Self-Consciousness.

| <u>Source</u> | <u>F</u> | <u>p</u> |
|-------------------|----------|----------|
| Mirror (A) | 0.36 | .55 |
| Eval. App. (B) | 0.73 | .39 |
| Cues (C) | 1.23 | .27 |
| Subject Sex (D) | 3.53 | .06 |
| Experimenter (E) | 0.12 | .73 |
| A x B | 0.26 | .61 |
| A x C | 0.07 | .860 |
| A x D | 4.93 | .028 |
| A x E | 0.03 | .86 |
| B x C | 0.47 | .50 |
| B x D | 1.64 | .20 |
| B x E | 0.59 | .44 |
| C x D | 0.12 | .73 |
| C x E | 1.43 | .23 |
| D x E | 6.14 | .015 |
| A x B x C | 1.05 | .31 |
| A x B x D | 0.36 | .55 |
| A x B x E | 9.99 | .002 |
| A x C x D | 0.47 | .50 |
| A x C x E | 1.05 | .31 |
| A x D x E | 0.36 | .55 |
| B x C x D | 0.59 | .44 |
| B x C x E | 2.64 | .11 |
| B x D x E | 2.37 | .13 |
| C x D x E | 0.18 | .67 |
| A x B x C x D | 5.32 | .023 |
| A x B x C x E | 1.64 | .20 |
| A x B x D x E | 0.00 | 1.00 |
| A x C x D x E | 4.56 | .035 |
| B x C x D x E | 1.05 | .31 |
| A x B x C x D x E | 0.03 | .86 |

Note. Degrees-of-freedom for each hypothesis were 1 and 128.

Table 12

Summary Table for MANOVA on Measures of Cooperation and Defiance

| <u>Source</u> | <u>F</u> | <u>p</u> | <u>SDW's</u> | |
|-------------------|----------|----------|--------------|----------|
| | | | Cooperation | Defiance |
| Mirror (A) | 1.51 | .23 | 0.14 | 1.00 |
| Eval. App. (B) | 2.25 | .11 | -.0551 | 0.81 |
| Cues (C) | 5.13 | .007 | 0.16 | 1.00 |
| Subject Sex (D) | 1.63 | .20 | -.031 | 0.92 |
| Experimenter (E) | 0.18 | .83 | 1.00 | 0.19 |
| A x B | 0.13 | .88 | 0.23 | 11.00 |
| A x C | 0.58 | .56 | 0.75 | 0.74 |
| A x D | 0.04 | .96 | -.014 | 0.98 |
| A x E | 0.50 | .61 | 0.55 | 0.89 |
| B x C | 5.67 | .004 | 0.24 | 1.00 |
| B x D | 0.92 | .40 | -.035 | 0.90 |
| B x E | 3.01 | .053 | 0.23 | 1.00 |
| C x D | 1.92 | .15 | 0.13 | 1.00 |
| C x E | 1.45 | .24 | 0.74 | 0.76 |
| D x E | 1.75 | .18 | 0.98 | 0.31 |
| A x B x C | 0.69 | .51 | 0.79 | -.054 |
| A x B x D | 0.37 | .69 | 0.90 | 0.54 |
| A x B x E | 1.04 | .36 | 0.82 | -.050 |
| A x C x D | 0.58 | .56 | 0.64 | 0.84 |
| A x C x E | 0.10 | .90 | 0.80 | 0.69 |
| A x D x E | 0.38 | .69 | -.029 | 0.93 |
| B x C x D | 0.02 | .99 | -.029 | 0.93 |
| B x C x E | 0.70 | .50 | 0.92 | -.033 |
| B x D x E | 1.75 | .18 | 0.21 | 1.00 |
| C x D x E | 0.75 | .47 | 0.87 | -.041 |
| A x B x C x D | 0.93 | .40 | 0.52 | 0.91 |
| A x B x C x E | 0.40 | .67 | 0.99 | 0.28 |
| A x B x D x E | 0.41 | .66 | -.074 | -.060 |
| A x C x D x E | 1.06 | .35 | 0.91 | 0.51 |
| B x C x D x E | 2.85 | .06 | 0.02 | 1.00 |
| A x B x C x D x E | 1.45 | .24 | -.058 | 0.76 |

Note. Degrees-of-freedom for each hypothesis were 2 and 127.

Table 13

Mean Overall Frequency of Personal Pronoun Use

| Experimenter | Sex of Subject | Mirror Absent | | | | Mirror Present | | | |
|--------------|----------------|------------------------------|---------|-----------------------------|---------|------------------------------|---------|-----------------------------|---------|
| | | High Evaluation Apprehension | | Low Evaluation Apprehension | | High Evaluation Apprehension | | Low Evaluation Apprehension | |
| | | Cues | No Cues | Cues | No Cues | Cues | No Cues | Cues | No Cues |
| 1 | Male | 27.6 | 21.8 | 20.2 | 24.2 | 27.0 | 26.6 | 24.6 | 21.6 |
| | Female | 20.8 | 20.0 | 18.2 | 24.6 | 25.0 | 23.8 | 25.2 | 25.2 |
| 2 | Male | 30.0 | 25.4 | 23.6 | 22.2 | 27.4 | 21.0 | 24.2 | 21.6 |
| | Female | 22.6 | 23.0 | 27.4 | 25.0 | 26.8 | 18.8 | 23.4 | 19.6 |

Note: Means based upon 5 subjects per cell. Standard deviation = 6.4.

Table 14

Mean Frequency of Personal Pronoun Use for the First Block of 20 Trials

| Experimenter | Sex of Subject | Mirror Absent | | | | Mirror Present | | | |
|--------------|----------------|------------------------------|---------|-----------------------------|---------|------------------------------|---------|-----------------------------|---------|
| | | High Evaluation Apprehension | | Low Evaluation Apprehension | | High Evaluation Apprehension | | Low Evaluation Apprehension | |
| | | Cues | No Cues | Cues | No Cues | Cues | No Cues | Cues | No Cues |
| 1 | Male | 10.04 | 7.8 | 8.2 | 8.4 | 8.4 | 9.0 | 9.2 | 7.6 |
| | Female | 7.2 | 7.2 | 5.6 | 8.8 | 7.0 | 8.2 | 8.8 | 9.0 |
| 2 | Male | 10.4 | 9.0 | 7.6 | 6.8 | 10.2 | 10.6 | 8.0 | 8.2 |
| | Female | 8.6 | 6.2 | 7.8 | 8.4 | 10.0 | 6.0 | 9.2 | 6.4 |

Note: Means based upon 5 subjects per cell. Standard deviation = 2.9.

Table 15

Mean Frequency of Personal Pronoun Use for the Second Block of 20 Trials

| Experimenter | Sex of Subject | Mirror Absent | | | | Mirror Present | | | |
|--------------|----------------|------------------------------|---------|-----------------------------|---------|------------------------------|---------|-----------------------------|---------|
| | | High Evaluation Apprehension | | Low Evaluation Apprehension | | High Evaluation Apprehension | | Low Evaluation Apprehension | |
| | | Cues | No Cues | Cues | No Cues | Cues | No Cues | Cues | No Cues |
| 1 | Male | 9.0 | 7.4 | 5.4 | 8.2 | 9.2 | 8.6 | 7.6 | 7.0 |
| | Female | 7.2 | 6.2 | 6.6 | 7.2 | 7.4 | 8.2 | 7.8 | 8.4 |
| 2 | Male | 10.8 | 7.6 | 7.6 | 7.2 | 8.0 | 6.6 | 8.4 | 6.8 |
| | Female | 7.0 | 8.8 | 9.8 | 7.4 | 8.2 | 6.2 | 7.8 | 6.4 |

Note: Means based upon 5 subjects per cell. Standard deviation = 2.7.

Table 16

Mean Frequency of Personal Pronoun Use for the Third Block of 20 Trials

| Experimenter | Sex of Subject | Mirror Absent | | | | Mirror Present | | | |
|--------------|----------------|------------------------------|---------|-----------------------------|---------|------------------------------|---------|-----------------------------|---------|
| | | High Evaluation Apprehension | | Low Evaluation Apprehension | | High Evaluation Apprehension | | Low Evaluation Apprehension | |
| | | Cues | No Cues | Cues | No Cues | Cues | No Cues | Cues | No Cues |
| 1 | Male | 8.2 | 6.6 | 6.6 | 7.6 | 9.4 | 9.0 | 7.8 | 7.0 |
| | Female | 6.4 | 6.6 | 6.0 | 8.6 | 10.6 | 7.4 | 8.6 | 7.8 |
| 2 | Male | 8.8 | 8.8 | 8.4 | 8.2 | 9.2 | 6.8 | 7.8 | 6.6 |
| | Female | 7.0 | 8.0 | 9.8 | 9.2 | 8.6 | 6.6 | 6.4 | 6.8 |

Note: Means based upon 5 subjects per cell. Standard deviation = 2.6.

Table 17

Mean Speed of Performance in Minutes

| Experimenter | Sex of Subject | Mirror Absent | | | | Mirror Present | | | |
|--------------|----------------|------------------------------|---------|-----------------------------|---------|------------------------------|---------|-----------------------------|---------|
| | | High Evaluation Apprehension | | Low Evaluation Apprehension | | High Evaluation Apprehension | | Low Evaluation Apprehension | |
| | | Cues | No Cues | Cues | No Cues | Cues | No Cues | Cues | No Cues |
| 1 | Male | 22.22 | 25.5 | 22.9 | 20.4 | 21.5 | 21.7 | 15.2 | 18.1 |
| | Female | 24.4 | 19.6 | 18.8 | 21.4 | 17.4 | 24.5 | 13.7 | 19.0 |
| 2 | Male | 23.3 | 20.9 | 20.0 | 20.1 | 21.7 | 28.9 | 15.5 | 21.2 |
| | Female | 17.2 | 22.8 | 19.9 | 18.6 | 20.2 | 22.3 | 14.622 | 14.9 |

Note: Means based upon 5 subjects per cell. Standard deviation = 6.6.

Table 18

Mean Self-Attribution

| Experimenter | Sex of Subject | Mirror Absent | | | | Mirror Present | | | |
|--------------|----------------|------------------------------|---------|-----------------------------|---------|------------------------------|---------|-----------------------------|---------|
| | | High Evaluation Apprehension | | Low Evaluation Apprehension | | High Evaluation Apprehension | | Low Evaluation Apprehension | |
| | | Cues | No Cues | Cues | No Cues | Cues | No Cues | Cues | No Cues |
| 1 | Male | 5.2 | 5.8 | 4.4 | 4.8 | 6.0 | 5.8 | 6.0 | 4.6 |
| | Female | 5.0 | 4.0 | 3.6 | 5.6 | 5.4 | 5.6 | 4.8 | 3.4 |
| 2 | Male | 5.6 | 5.6 | 4.6 | 6.8 | 5.6 | 5.2 | 5.8 | 5.0 |
| | Female | 6.4 | 5.2 | 5.6 | 4.0 | 5.2 | 5.4 | 6.2 | 6.6 |

Note: Means based upon 5 subjects per cell. Standard deviation = 1.7.

Table 19

Mean Attributions to the Experimenter

| Experimenter | Sex of Subject | Mirror Absent | | | | Mirror Present | | | |
|--------------|----------------|------------------------------|---------|-----------------------------|---------|------------------------------|---------|-----------------------------|---------|
| | | High Evaluation Apprehension | | Low Evaluation Apprehension | | High Evaluation Apprehension | | Low Evaluation Apprehension | |
| | | Cues | No Cues | Cues | No Cues | Cues | No Cues | Cues | No Cues |
| 1 | Male | 3.0 | 2.2 | 1.2 | 2.2 | 2.4 | 2.4 | 4.0 | 2.2 |
| | | 1.6 | 2.6 | 2.6 | 1.4 | 2.8 | 2.8 | 4.0 | 2.0 |
| | Female | | | | | | | | |
| | | | | | | | | | |
| 2 | Male | 1.8 | 2.4 | 3.2 | 1.6 | 2.4 | 2.4 | 2.0 | 1.4 |
| | Female | 3.0 | 1.2 | 2.8 | 1.4 | 2.0 | 2.4 | 3.6 | 4.0 |

Note: Means based upon 5 subjects per cell. Standard deviation = 1.7.

Table 20

Mean Attributions to the Task

| Experimenter | Sex of Subject | Mirror Absent | | | | Mirror Present | | | |
|--------------|----------------|------------------------------|---------|-----------------------------|---------|------------------------------|---------|-----------------------------|---------|
| | | High Evaluation Apprehension | | Low Evaluation Apprehension | | High Evaluation Apprehension | | Low Evaluation Apprehension | |
| | | Cues | No Cues | Cues | No Cues | Cues | No Cues | Cues | No Cues |
| 1 | Male | 4.4 | 3.2 | 4.8 | 3.6 | 5.8 | 5.4 | 5.6 | 5.2 |
| | Female | 5.2 | 4.2 | 4.8 | 4.4 | 3.8 | 4.4 | 5.6 | 5.6 |
| 2 | Male | 5.2 | 5.6 | 4.0 | 4.0 | 4.8 | 4.8 | 5.2 | 4.0 |
| | Female | 5.4 | 5.4 | 4.2 | 3.6 | 2.8 | 4.2 | 6.4 | 5.4 |

Note: Means based upon 5 subjects per cell. Standard deviation = 1.5.

Table 21

Mean Attributions to the Subject Role

| Experimenter | Sex of Subject | Mirror Absent | | | | Mirror Present | | | |
|--------------|----------------|------------------------------|---------|-----------------------------|---------|------------------------------|---------|-----------------------------|---------|
| | | High Evaluation Apprehension | | Low Evaluation Apprehension | | High Evaluation Apprehension | | Low Evaluation Apprehension | |
| | | Cues | No Cues | Cues | No Cues | Cues | No Cues | Cues | No Cues |
| 1 | Male | 3.2 | 3.2 | 2.2 | 3.0 | 2.4 | 4.0 | 5.0 | 2.2 |
| | Female | 3.6 | 3.0 | 3.0 | 3.8 | 1.4 | 3.8 | 3.6 | 3.6 |
| 2 | Male | 2.8 | 3.0 | 4.0 | 2.8 | 4.6 | 4.2 | 4.0 | 3.2 |
| | Female | 4.4 | 3.6 | 3.6 | 3.2 | 2.2 | 3.2 | 5.2 | 2.4 |

Note: Means based upon 5 subjects per cell. Standard deviation = 1.8.

Table 22

Mean Self-Reported Anxiety

| Experimenter | Sex of Subject | Mirror Absent | | | | Mirror Present | | | |
|--------------|----------------|------------------------------|---------|-----------------------------|---------|------------------------------|---------|-----------------------------|---------|
| | | High Evaluation Apprehension | | Low Evaluation Apprehension | | High Evaluation Apprehension | | Low Evaluation Apprehension | |
| | | Cues | No Cues | Cues | No Cues | Cues | No Cues | Cues | No Cues |
| 1 | Male | 3.8 | 3.6 | 2.4 | 3.8 | 3.6 | 3.8 | 3.6 | 3.0 |
| | Female | 4.2 | 4.6 | 3.2 | 4.2 | 4.6 | 3.8 | 3.8 | 3.0 |
| 2 | Male | 4.0 | 3.4 | 4.2 | 4.2 | 4.8 | 4.8 | 3.8 | 2.8 |
| | Female | 2.0 | 3.6 | 4.4 | 2.4 | 3.2 | 3.0 | 4.6 | 3.2 |

Note: Means based upon 5 subjects per cell. Standard deviation = 1.8

Table 23

Mean Self-Reported Apprehensiveness

| Experimenter | Sex of Subject | Mirror Absent | | | | Mirror Present | | | |
|--------------|----------------|------------------------------|---------|-----------------------------|---------|------------------------------|---------|-----------------------------|---------|
| | | High Evaluation Apprehension | | Low Evaluation Apprehension | | High Evaluation Apprehension | | Low Evaluation Apprehension | |
| | | Cues | No Cues | Cues | No Cues | Cues | No Cues | Cues | No Cues |
| 1 | Male | 4.2 | 4.0 | 2.0 | 3.4 | 2.6 | 4.0 | 4.2 | 2.8 |
| | Female | 5.4 | 5.4 | 4.0 | 2.8 | 3.0 | 2.2 | 3.0 | 3.8 |
| 2 | Male | 3.6 | 3.0 | 3.4 | 4.2 | 4.2 | 5.0 | 4.4 | 3.0 |
| | Female | 3.4 | 4.2 | 4.0 | 2.4 | 2.6 | 2.6 | 4.4 | 2.6 |

Note: Means based upon 5 subjects per cell. Standard deviation = 1.7.

Table 24

Mean Self-Reported Concern Over Performance

| Experimenter | Sex of Subject | Mirror Absent | | | | Mirror Present | | | |
|--------------|----------------|------------------------------|---------|-----------------------------|---------|------------------------------|---------|-----------------------------|---------|
| | | High Evaluation Apprehension | | Low Evaluation Apprehension | | High Evaluation Apprehension | | Low Evaluation Apprehension | |
| | | Cues | No Cues | Cues | No Cues | Cues | No Cues | Cues | No Cues |
| 1 | Male | 5.6 | 2.2 | 3.6 | 4.4 | 5.0 | 3.8 | 2.6 | 2.2 |
| | Female | 4.6 | 6.4 | 3.2 | 3.4 | 3.4 | 4.0 | 2.8 | 2.2 |
| 2 | Male | 3.0 | 5.2 | 2.0 | 5.0 | 3.2 | 5.6 | 1.6 | 2.4 |
| | Female | 4.8 | 4.6 | 6.2 | 3.8 | 2.4 | 3.6 | 5.0 | 2.8 |

Note: Means based upon 5 subjects per cell. Standard deviation = 1.8.

Table 25

Mean Self-Reported Feelings of Evaluation

| Experimenter | Sex of Subject | Mirror Absent | | | | Mirror Present | | | |
|--------------|----------------|------------------------------|---------|-----------------------------|---------|------------------------------|---------|-----------------------------|---------|
| | | High Evaluation Apprehension | | Low Evaluation Apprehension | | High Evaluation Apprehension | | Low Evaluation Apprehension | |
| | | Cues | No Cues | Cues | No Cues | Cues | No Cues | Cues | No Cues |
| 1 | Male | 6.2 | 4.4 | 4.0 | 4.2 | 4.6 | 5.4 | 6.0 | 3.4 |
| | Female | 6.2 | 5.0 | 3.4 | 4.0 | 4.2 | 5.4 | 3.2 | 4.4 |
| 2 | Male | 4.4 | 5.2 | 3.4 | 3.2 | 3.6 | 6.0 | 4.0 | 2.0 |
| | Female | 4.6 | 4.0 | 5.4 | 4.2 | 3.4 | 4.8 | 4.2 | 3.8 |

Note: Means based upon 5 subjects per cell. Standard deviation = 2.0.

Table 26

Mean Retrospective Expected Success

| Experimenter | Sex of Subject | Mirror Absent | | | | Mirror Present | | | |
|--------------|----------------|------------------------------|---------|-----------------------------|---------|------------------------------|---------|-----------------------------|---------|
| | | High Evaluation Apprehension | | Low Evaluation Apprehension | | High Evaluation Apprehension | | Low Evaluation Apprehension | |
| | | Cues | No Cues | Cues | No Cues | Cues | No Cues | Cues | No Cues |
| 1 | Male | 4.8 | 4.8 | 6.8 | 5.6 | 5.8 | 4.8 | 5.8 | 4.6 |
| | Female | 4.6 | 4.0 | 4.0 | 5.8 | 4.2 | 5.4 | 4.6 | 4.6 |
| 2 | Male | 5.6 | 5.8 | 6.2 | 5.4 | 5.4 | 6.0 | 5.4 | 5.0 |
| | Female | 4.0 | 5.0 | 5.0 | 6.0 | 4.2 | 5.4 | 4.8 | 5.2 |

Note: Means based upon 5 subjects per cell. Standard deviation = 1.8.

Table 27

Mean Perceived Success

| Experimenter | Sex of Subject | Mirror Absent | | | | Mirror Present | | | |
|--------------|----------------|------------------------------|---------|-----------------------------|---------|------------------------------|---------|-----------------------------|---------|
| | | High Evaluation Apprehension | | Low Evaluation Apprehension | | High Evaluation Apprehension | | Low Evaluation Apprehension | |
| | | Cues | No Cues | Cues | No Cues | Cues | No Cues | Cues | No Cues |
| 1 | Male | 4.2 | 4.8 | 6.4 | 5.2 | 4.8 | 4.4 | 5.2 | 3.8 |
| | Female | 4.6 | 4.8 | 3.6 | 5.2 | 4.2 | 5.2 | 4.8 | 5.0 |
| 2 | Male | 6.0 | 5.2 | 5.4 | 5.6 | 5.0 | 5.0 | 4.6 | 5.4 |
| | Female | 4.4 | 4.6 | 4.6 | 4.6 | 4.6 | 4.4 | 3.4 | 4.8 |

Note: Means based upon 5 subjects per cell. Standard deviation = 1.3.

Table 28

Mean Self-Reported Self-Consciousness

| Experimenter | Sex of Subject | Mirror Absent | | | | Mirror Present | | | |
|--------------|----------------|------------------------------|---------|-----------------------------|---------|------------------------------|---------|-----------------------------|---------|
| | | High Evaluation Apprehension | | Low Evaluation Apprehension | | High Evaluation Apprehension | | Low Evaluation Apprehension | |
| | | Cues | No Cues | Cues | No Cues | Cues | No Cues | Cues | No Cues |
| 1 | Male | 5.2 | 2.6 | 2.6 | 3.2 | 3.0 | 4.8 | 4.4 | 3.8 |
| | Female | 4.8 | 4.8 | 3.0 | 3.6 | 3.6 | 3.4 | 3.6 | 4.2 |
| 2 | Male | 3.6 | 3.6 | 3.6 | 4.4 | 6.4 | 5.4 | 5.0 | 2.6 |
| | Female | 2.2 | 2.8 | 5.8 | 2.6 | 2.6 | 3.0 | 3.0 | 2.4 |

Note: Means based upon 5 subjects per cell. Standard deviation = 1.9.

Table 29

Mean Self-Reported Cooperativeness

| Experimenter | Sex of Subject | Mirror Absent | | | | Mirror Present | | | |
|--------------|----------------|------------------------------|---------|-----------------------------|---------|------------------------------|---------|-----------------------------|---------|
| | | High Evaluation Apprehension | | Low Evaluation Apprehension | | High Evaluation Apprehension | | Low Evaluation Apprehension | |
| | | Cues | No Cues | Cues | No Cues | Cues | No Cues | Cues | No Cues |
| 1 | Male | 6.0 | 6.4 | 6.8 | 5.8 | 6.8 | 6.0 | 6.2 | 5.8 |
| | Female | 6.2 | 6.2 | 6.6 | 5.4 | 6.0 | 6.6 | 5.4 | 5.8 |
| 2 | Male | 6.4 | 6.2 | 5.4 | 6.0 | 5.4 | 6.2 | 6.0 | 6.4 |
| | Female | 6.4 | 6.6 | 6.4 | 6.2 | 7.0 | 6.4 | 6.2 | 6.6 |

Note: Means based upon 5 subjects per cell. Standard deviation = 1.2

Table 30

Mean Self-Reported Defiance

| Experimenter | Sex of Subject | Mirror Absent | | | | Mirror Present | | | |
|--------------|----------------|------------------------------|---------|-----------------------------|---------|------------------------------|---------|-----------------------------|---------|
| | | High Evaluation Apprehension | | Low Evaluation Apprehension | | High Evaluation Apprehension | | Low Evaluation Apprehension | |
| | | Cues | No Cues | Cues | No Cues | Cues | No Cues | Cues | No Cues |
| 1 | Male | 3.2 | 3.4 | 3.4 | 2.6 | 1.6 | 3.0 | 3.8 | 1.4 |
| | Female | 3.4 | 1.8 | 3.8 | 1.2 | 3.0 | 1.6 | 2.2 | 1.6 |
| 2 | Male | 2.4 | 2.4 | 3.2 | 2.8 | 2.6 | 3.0 | 3.0 | 2.4 |
| | Female | 1.6 | 1.8 | 5.2 | 2.6 | 1.0 | 2.0 | 4.0 | 1.8 |

Note: Means based upon 5 subjects per cell. Standard deviation = 1.4.

Appendix E: Validation Study

Validation Study

Method

Subjects. Subjects were 28 male and 29 female introductory psychology students who participated in order to receive experimental credit. None of the subjects had participated in Study 1. The data from one subject of each sex were discarded due to failure to follow the experimental instructions.

Procedure

Subjects participated in the study in same-sex groups of four to eight. Subjects were told the study involved the collection of survey data. They were given a response booklet which contained the 60 randomly ordered verb-pronoun sets used in Study 1 (see Appendix F). There were four verb-pronoun sets on each page, with room below each for the subject to write a sentence. Subjects were asked to write down the first sentence that came to mind for each of the verb-pronoun sets.

After completing the 60 sentences, subjects were given an unlabelled copy of the Self-consciousness Scale (Fenigstein et al., 1975), which, through the private self-consciousness subscale, assesses the individual difference analog to a state of objective self-awareness. Finally, subjects were given a post-experimental questionnaire which asked their thoughts on the nature of the experiment and how they went about making up their sentences.

SUBJECT QUESTIONNAIRE*

We are interested in your ideas, thoughts and understanding of the experiment you have just completed. Please answer each of the questions on the next several pages in their numbered order. Please DO NOT go on to the next question until you have given an answer to the previous question and please do not go back to a question once you have started on the next one.

1. What did you think the experiment was about?
2. (a) While going through the sentences did you think you were supposed to make them up in any particular way?
(b) How?
3. How did you go about deciding which of the pronouns to use?
4. While you were writing the sentences, how well did you think you were doing? (Check one spot on the scale below)
very poorly _ _ _ _ _ very well
5. What aspect of your sentences do you think the experimenter will examine when scoring your responses? Why do you think these aspects are important?
6. The results of experiments of this type are more easily understood if we understand each subject's prior exposure to this kind of study.
(a) Have you heard anything about this experiment or an experiment of this type from your friends or other students?

If so, what?

- (b) Have you read in textbooks or heard in lectures about experiments of this type? If so, what?

* Each question originally on a separate sheet.

Appendix F: Materials - Validation Study

Instructions

The study you are participating in today involves the collection of some survey data. What I would like you to do is to construct a number of sentences. On the desk in front of you, you will find a pencil, and a response booklet. Once you start the sentence construction task, the pages of the booklet are to be turned over one at a time. On each page of the booklet are four sets of words. Each set contains one past-tense verb and six pronouns.

For each verb-pronoun set, your task will be to construct and write down a sentence that begins with one of the pronouns, and uses the verb. Just write down the first sentence that comes into your mind.

Now look at the first page of the booklet. This page will be used to give you an example. On that page, you can see the past-tense verb "ate", and the six pronouns, "we, they, I, he, you, and she." The sentence for this set should start with one of the pronouns, whichever one you prefer, and should use the verb on the card; in this case the verb "ate." So, for this example, you might write down the sentence "he ate the apple," or, you might write, "we ate supper at my house." Now please turn the page and complete the sixty remaining verb-pronoun sets.

VERB-PRONOUN SETS*

EXAMPLE

ATE

WE THEY I HE YOU SHE

Sample responses:

He ate the apple.

or

We ate supper at my house

If you have understood the instructions, please turn the page and complete the sixty remaining verb-pronoun sets.

1.

BECAME

SHE HE YOU WE THEY I

2.

NEEDED

YOU I THEY HE WE SHE

3.

WAITED

YOU I WE HE SHE THEY

4.

GOT

WE YOU THEY HE I SHE

5.

RODE

I SHE THEY YOU WE HE

6.

FELT

WE I SHE YOU THEY HE

7.

HAD
WE HE YOU I THEY SHE

8.

KEPT
THEY YOU SHE WE HE I

9.

GREW
WE YOU SHE I THEY HE

10.

DID
SHE YOU I WE HE THEY

11.

CALLED
SHE WE THEY HE YOU I

12.

RAN
I SHE THEY YOU WE HE

13.

CAME
SHE THEY I HE YOU WE

14.

DREW
SHE YOU HE THEY WE I

15.

READ
YOU WE THEY HE SHE I

16.

SHOWED
I WE SHE HE YOU THEY

17.

BLEW
SHE HE I YOU THEY WE

18.

ADDED
THEY I WE YOU SHE HE

19.

BROUGHT

SHE WE HE I YOU THEY

20.

BURNED

SHE WE THEY HE YOU I

21.

FELL

WE THEY I HE YOU SHE

22.

BELIEVED

SHE HE I YOU THEY WE

23.

CARED

SHE THEY I HE YOU WE

24.

WAS

THEY I WE YOU SHE HE

25.

TALKED

I WE YOU SHE HE THEY

26.

LOVED

THEY HE I YOU SHE WE

27.

STOOD

I WE YOU HE SHE THEY

28.

SLEPT

I THEY YOU HE SHE WE

29

WENT

HE WE YOU SHE I THEY

30.

CARRIED

SHE THEY YOU HE WE I

31.

ANSWERED

YOU THEY SHE WE I HE

32.

RAISED

YOU WE THEY HE SHE I

33.

LIVED

THEY WE I HE YOU SHE

34.

RECEIVED

I YOU THEY SHE HE WE

35.

LOST

THEY HE I YOU SHE WE

36.

ASKED

YOU THEY SHE WE I HE

37.

DROPPED

WE SHE THEY YOU HE I

38.

TOLD

I HE SHE THEY WE YOU

39.

HELD

THEY YOU SHE WE HE I

40.

OPENED

YOU THEY HE SHE WE I

41.

SAID

I SHE WE HE YOU THEY

42.

CHANGED

SHE YOU WE I HE THEY

43.

TRIED

I HE SHE THEY WE YOU

44.

MOVED

YOU I THEY HE WE SHE

45.

REACHED

I YOU THEY SHE HE WE

46.

BEGAN

SHE HE YOU WE THEY I

47.

MADE

YOU HE THEY SHE I WE

48.

SPOKE

I THEY YOU HE SHE WE

49.

TOOK

I WE YOU SHE HE THEY

50.

PAID

YOU WE HE I SHE THEY

51.

COVERED

SHE YOU WE I HE THEY

52.

KNEW

THEY YOU I HE WE SHE

53.

SET

I WE SHE HE YOU THEY

54.

CUT

SHE YOU I WE HE THEY

55.

SENT

I WE YOU SHE THEY HE

56.

STAYED

I WE YOU HE SHE THEY

57.

FOUND

WE YOU THEY HE I SHE

58.

WENT

WE YOU SHE I THEY HE

59.

LIKED

THEY WE SHE HE YOU I

60.

OWNED

YOU THEY HE SHE WE I

*Originally presented with 4 items to a page.

SELF-CONSCIOUSNESS SCALE

On the pages that follow you will find a number of statements that an individual might make about himself or herself. We would like you to read these statements carefully, and decide how typical or atypical each one is of you.

Make your responses in pencil on the accompanying IBM sheet. Please do not make any marks on this questionnaire itself. It does not matter if you have filled out this scale in the past. Just respond to each statement as honestly and frankly as you can.

Please respond to each of the statements on the following page using this scale:

| | | | | | | | |
|------------------|--|---|---|---|---|---|----------------|
| extremely | | 1 | 2 | 3 | 4 | 5 | extremely |
| uncharacteristic | | | | | | | characteristic |

If a statement is extremely uncharacteristic of you (that is, you very much unlike the statement) then fill in the bubble marked "1" for that statement on the IBM sheet. If a statement is extremely characteristic of you (that is, you are very much like the statement), then fill in the bubble marked "5" for that statement on the IBM sheet. If you are somewhere in between these two extremes, then fill in the bubble ("2," "3," or "4") that best describes how characteristic the statement is of you. This scale is reproduced at the top of each page.

Please make sure the question number on the IBM sheet corresponds to the number of the statement you are responding to, and that you respond to each statement.

Now please turn the page and begin.

extremely uncharacteristic 1 2 3 4 5 extremely characteristic

1. I'm always trying to figure myself out.
2. I'm concerned about my style of doing things.
3. Generally, I'm not very aware of myself.
4. It takes me time to overcome my shyness in new situations.
5. I reflect about myself a lot.
6. I'm concerned about the way I present myself.
7. I'm often the subject of my own fantasies.
8. I have trouble working when someone is watching me.
9. I never scrutinize myself.
10. I get embarrassed very easily.
11. I'm self-conscious about the way I look.
12. I don't find it hard to talk to strangers.
13. I'm generally attentive to my inner feelings.
14. I usually worry about making a good impression.
15. I'm constantly examining my motives.
16. I feel anxious when I speak in front of a group.
17. One of the last things I do before I leave my house is look in the mirror.
18. I sometimes have the feeling that I'm off somewhere watching myself.
19. I'm concerned about what other people think of me.
20. I'm alert to changes in my mood.
21. I'm usually aware of my appearance.

extremely uncharacteristic 1 2 3 4 5 extremely characteristic

22. I'm aware of the way my mind works when I work through a problem.

23. Large groups make me nervous.

Appendix G: Other Results

Several significant results were not presented in the text either because they had little or no relevance to the major hypothesis, or because they were uninterpretable. For archival purposes, these results are presented below.

MANOVA on self-reports of cooperativeness and defiance indicated significant effect for cues, $F(2,127) = 5.13$, $p < .007$, which was qualified by an interaction with evaluation apprehension, $F(2,127) = 5.67$, $p < .004$. For both effects, defiance was the only discriminating variable ($SDW = 1.0$ for both effects; cooperation SDW 's = both $< .25$). Examination of means indicates subjects in the low evaluation apprehension/cues present condition felt more defiant ($M = 3.6$) than did subjects in the low evaluation apprehension/cues absent condition ($M = 2.1$) or those in either of the high evaluation apprehension conditions (M 's = 2.4 for both high evaluation apprehension conditions). The increase in reported defiance in the low evaluation apprehension/cues present condition likely represent subjects' feelings of resentment from the introduction of behavioural standards (via the cues) when no evaluation was supposed to occur. No other significant effects were observed on these variables.

Analysis of subjects' self-reported anxiety, apprehensiveness, concern over performance and feelings of evaluation revealed two uninterpretable interactions. The meaning of the interaction of evaluation apprehension and mirror presence [$F(4,125) = 2.70$, $p < .05$] was unclear since the composite of variables representing this multivariate effect (a contrast of apprehensiveness on the one hand with anxiety and concern over performance on the other) was conceptually meaningless.

The interaction of cue presence, sex of subject and experimenter [$F(4,125) = 4.29, p < .003$] was uninterpretable since it was impossible to identify the characteristics of the experimenters that were critical for this effect.

Several higher order interactions were found on self-reported self-consciousness, including sex of subject by experimenter, mirror by evaluation apprehension by experimenter; mirror by cues by sex of subject by experimenter; and mirror by evaluation apprehension by cues by sex of subject (all p 's $< .035$). Unfortunately, the pattern of means associated with each of these effects is quite complex and appear uninterpretable. This is particularly true of the first three interactions above, in which the experimenters produced quite different results although they had minimal interaction with subjects. It is impossible to interpret these interactions since it is unclear which qualities of the experimenters produced the differences.

MANOVA on attributions to the self, the experimenter, the task, and the subject role revealed only a significant interaction of mirror and evaluation apprehension that was entirely due to variation in attributions to the task. Since as indicated in the discussion, it is unclear exactly what effect the mirror had in the present study, it is impossible to interpret this effect.