THE EFFECT OF AN EXPERIMENTER'S PRESENCE OR ABSENCE DURING ADMINISTRATION OF THE DRAW A PERSON TEST

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ABSTRACT

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Handler and Reyher (1964) compared figure drawings (man, woman, car) obtained from the same subjects under high and low performance anxiety conditions. Based on their results they concluded that manifestations of anxiety in human figure drawings have two sources: a) the anxiety producing characteristics of the laboratory situation, and b) the anxiety producing intrapsychic processes that are activated by drawing the human anatomy in an interpersonal context. The current study replicated their work by comparing figure drawings (person, opposite sex person, car) that were obtained when the experimenter was present (high performance anxiety) to figure drawings obtained when the experimenter was absent (low performance anxiety). This study also evaluated the effects of specific experimenters, the sex of these experimenters, and the sex of the subjects. The dependent measures were 15 drawing variables, two measures of sympathetic nervous system activation (electrodermal response), and the amount of time spent on each drawing. The results replicated Handler and Reyher's (1964) findings for the drawing indexes. However, findings for SNS activation and time spent drawing indicate that differences

in the drawings reflect successful avoidance of anxiety by flight from the situation rather than feelings of anxiety while in the situation. They also indicated that the experience of the subjects was quite different, depending on whether the experimenter was present or absent. When the experimenter was present, participants appeared to be more anxious about how they were impressing the experimenter (interpersonal anxiety). When the experimenter was absent, the participants appeared to be more anxious about performing the tasks well (performance anxiety). The pattern of results in this study was interpreted via Wicklund's (1975) objective self awareness theory, which adequately explained the findings.

This thesis represents the collective contributions of numerous individuals who have dedicated large amounts of time and effort to see its completion. In the initial data collection phase Bob, Louise, Renee, Ann Marie, Ed, and Harold made their contributions as experimenters, while Karen and Jackie served as technicians. The long, tedious, and eye-straining task of coding the GSR data was performed by Anahid, Kathy, Lisa, Julie and Leslie. The frustrating task of rating the drawings was performed by Louise and Bob again, along with Mike, Tim, Carole, and Sue. To all of you, I appreciate your interest in the project and your dedication to performing good work. Special thanks must go to Louise and Bob, who worked for the full duration of the project, and to Anahid and Mike, who made contributions far above the call of duty.

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Handler and Reyher (1964) reported that laboratory induced stress (performance anxiety) produced a variety of graphic and stylistic changes on their subjects drawings of two human figures (male,female) and an automobile. They compared figure drawings obtained from the same subjects under a high performance anxiety condition (tested individually in a laboratory while attached to a polygraph) and a low performance anxiety condition (tested in groups in a classroom with implied anonymity). Although all three drawings were affected, a significantly greater number of graphic indexes of anxiety [1] differentiated the testing conditions for the human figure drawings than for the automobile drawing. They wanted to compare the human figures to a figure that was equally difficult to draw [2] ,but less likely to arouse anxiety. Since the automobile figure had fewer indexes that differentiated conditions, they concluded that manifestations of anxiety had two sources: a) the anxiety producing characteristics of the laboratory situation, and b) the anxiety producing intrapsychic processes that are activated by drawing the human anatomy in an interpersonal context. A later study (Handler and Reyher, 1966)

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1 Handler (1967) developed a manual for scoring 21 different graphic indexes of anxiety in human figure drawings. Examples are shading, placement, and distortion.

2. Handler (1963) had previously demonstrated that subjects considered these figures to be equally difficult to draw.

provided further support for this interpretation since subjects experienced higher levels of sympathetic nervous system activation (GSR frequency and GSR mean conductance) when drawing human figures than when drawing an automobile.

The pattern of findings for the graphic indexes in the original study (Handler and Reyher, 1964) suggested an explanation as to why the figure drawings differentiated the testing conditions so well. In the high performance anxiety condition, they found significantly less shading, hair shading, erasure, reinforcement, and emphasis lines, and significantly more distortion, head simplification, body simplification, detail loss, vertical imbalance, delineation line absence, and line pressure than in the low performance anxiety condition for the human figure drawings. They interpreted this pattern of results as reflecting a "dimunition in effort, articulation, and detail," and suggested that their subjects reacted to the anxiety producing characteristics of the task and/or laboratory situation by attempting to finish as quickly as possible and flee the situation.

This study serves as a very useful demonstration that projective test performance is affected by the testing situation as well as by the process of performing the task. However, it does not indicate which factors in testing situations alter performance since the high and low performance anxiety conditions differed in a number of significant ways. For example, several different dimensions were individual(observed) versus group (not observed) administration, identified versus anonymous performance, laboratory versus class room setting, and attached to polygraph versus not attached. It is unclear as to which of these factors, either alone or in combination, produced the results.

Of these dimensions, the presence of an observer is likely to be the most significant. A substantial body of literature has documented the effects of an observer's presence on the performance of a variety of tasks (e.g. Beiman, Israel, and Johnson, 1978; Borkovec, Grayson, and Cooper, 1978; Johnson and Wiese, 1979; Sacco, and Hokanson, 1978). One study was located that evaluated the effects of the presence of an observer on figure drawing performance. In this study Cassel, Johnson, and Burns (1958) reported that the number of "interpretable features" and the size of the person figure decreased when the experimenter was present on the House, Tree, Person drawing test. The number of "interpretable features" of the house figure also decreased when the experimenter was present.

If the presence of an observer does consistantly affect figure drawing performance, then a critical question arises. Are there individual differences among observers in the extent to which their actions or characteristics alter figure drawing performance? Holtzman (1952) reported nonsignificant results for the effects of individual experimenters, their sex (2 male, 2 female), and the sex of the subjects on size, head size, head:body ratio, vertical imbalance, and placement of human figure drawings. Silverstein (1966) had two different experimenters act either "tough" or "tender" when they obtained human figure drawings from high and low anxious retarded children (mean age=13.0, mean Stanford-Binet IQ=49.2). He found no differences on "quality measures" due to the experimenter variables. Starr and Marcuse (1959) reported no differences in the placement, size and head:body ratio of human figure drawings obtained one month apart by different experimenters.

The purpose of the present investigation was to replicate and extend Handler and Reyher's (1964) study. It was replicated by evaluating the influence of a variable (presence/absence of an experimenter) that is believed to alter performance anxiety and consequently performance on figure drawing tasks. It was extended by evaluating the influences of different experimenters and their sex on performance, and whether such variables differentially affected male and female subjects. The effects of these four variables were measured on fifteen graphic indexes of anxiety, the amount of time taken to draw each figure, the frequency of GSR skin responses, and GSR mean conductance.

Hypotheses

A statement of the rationale will precede a formal statement of the hypotheses. If a graphic index is primarily sensitive to externally induced anxiety, then it should significantly differentiate high and low performance anxiety conditions on all three draings. Out of the fifteen anxiety indexes being considered in this study, Handler and Reyher (1964) reported four that significantly differentiated the high and low performance anxiety conditions on all three drawings. These were shading, erasure, delineation line absences, and body simplification. Hair shading and head simplification differentiated conditions on both human figure drawings, but ratings were not made on the car drawing in their study for obvious reasons. Since they are conceptually similar to shading and body simplification respectively, it is unlikely that they are primarily sensitive to externally induced anxiety as well. However, if an anxiety index is primarily sensitive to annxiety induced by intrapsychic processes that are activated by drawing the human anatomy in an interpersonal situation, then it should significantly differentiate high and low anxiety conditions on the human figure drawings only. Of the fifteen anxiety indexes considered in the current project, only two fit the pattern in the Handler and Reyher study (1964). These were reinforcement and vertical imbalance.

Several other anxiety indexes were affected in the Handler and Reyher (1964) study, but the results across drawings did not fit either pattern listed above. In most cases only one drawing was affected, but for omissions, the male figure and the automobile were both significantly affected. It is unclear what these anxiety indexes actually reflect since the results were not consistent with either pattern. Given this rationale, a formal statement of the hypotheses is in order.

Hypothesis I. The presence of an experimenter serves as a source of laboratory induced performance anxiety during figure drawing tasks. Therefore, manifestations of anxiety that are known to be sensitive to external sources will be altered. Specifically, when an experimenter is present there will be less time spent (flight), a higher level of sympathetic nervous system activation (GSR mean conductance and frequency rate), less shading and hair shading, fewer erasures, a greater number of delineation line absences, and greater body and head simplifications than when the experimenter is absent on all drawings upon which these measures were taken.

Hypothesis II. The presence of an experimenter creates the interpersonal context which results in increased activation of the anxiety producing intrapsychic processes caused by drawing the human anatomy. Therefore, manifestations of anxiety known to be sensitive to anxiety produced by activated intrapsychic processes will be altered. Specifically, there will be increased reinforcement and vertical imbalance in the human figure drawings, but not in the car figure drawings.

METHOD

Participants

One hundred and five undergraduates from introductory psychology courses participated in this experiment. Nine of these participants were excluded and randomly replaced during the data collection phase. Seven of them drew incomplete figures prior to procedural changes made to compensate for this problem. Two had resistance levels above 500,000 ohms which led to inaccurate recording of the skin responses by the polygraph that was used. The remaining ninety-six participants (48 males, 48 females) represented the desired number that was needed to complete the balanced design.

Experimenters

The experimenters were six undergraduate advanced psychology majors (3 female, 3 male). They ranged in age between 20 and 23, with the exception of one woman who was 33 years old. All were caucasian, but were basically dissimilar in physical appearance. None of the experimenters recognized the participants that they tested.

Instruments

Handler Draw a Person Rating Scales. Handler (1967) developed scales for rating human figure drawings on twenty graphic indexes of anxiety. The following indexes were selected for use in the present study: shading, erasure, delineation line absence, body simplification, head simplification, vertical imbalance, reinforcement, hair shading, placement, line discontinuity, omission, size, head size, head:body ratio, and transparancy. Due to time and technical limitations the following indexes were not used: emphasis lines, light line–heavy line, line pressure increase, distortion, and detail loss.

Handler (1967) did not describe prcedures for rating the automobile in his manual. Therefore, analogous scales had to be developed which closely approximated the procedures used to rate the human figures (see Appendix I). Problems arose when this translation was attempted for the size variables and body simplification. Only the height of the human figure was measured.

Since a large amount of variance appeared to be present for both the height and the length of the automobile drawings, both dimensions were measured. These variables and their ratio (vertical:horizontal) were analyzed in the present study. Attempts at devising a reliable scale of body simplification for the car figure consistantly failed. After approximately ten hours of altering the scale and training raters, agreement between raters still failed to rise above chance levels. Therefore, this variable was not rated for the automobile figure drawing.

For each of the fifteen indexes, one pair out of eight potential raters was trained using Handler's manual. Before rating experimental data, each pair of raters had to achieve a level of 80% agreement on an independent set of 40 drawings. Once this critereon was achieved, this pair rated the entire set of experimental drawings for that variable. The dependent variables used in the analysis were computed by averaging the two ratings on each drawing for each variable.

Grass (Model 5) Six Chanel Polygraph. Skin resistance was continuously recorded on paper tape by the polygraph. Mean skin conductance was derived by averaging the reciprocals of resistance levels measured at twenty second intervals. The first reading was taken ten seconds after the participant began each task. Transforming the skin resistance level to its reciprocal, skin conductance, normalizes the heavily skewed resistance distribution. This variable provides a global measure of sympathetic nervous system arousal for each task.

The frequency of skin responses was measured by counting the number of pen deflections that were greater than the distance representing 1000 ohms for each task period. This sum was then divided by the amount of time taken to complete that task to obtain responses per second. This variable measures the reactivity of the participant's sympathetic nervous system to the task.

The time for each task was calculated by measuring the distance between marks on the paper tape made by the participant pressing the event marker button. This distance was easily converted into seconds since the paper tape progressed at a set rate (2.5 centimeters per second).

Procedure

Each participant was greeted and ushered into an eight foot square room. This room contained two chairs, a square table in one corner, an extra recliner in the opposite corner, and a small stand which contained the paraphanalia needed to clean and prepare the electrodes. The room was brightly lit, and the temperature was maintained at 72 degrees. The participant was seated at the table facing the wall. A clipboard which contained the experimental packet was secured to the table directly in front of the participant. A wall on the participant's right contained a hole through which the electrode and event marker wires passed. The experimenter's chair was on the participant's left which allowed the experimenter to face the participant when he or she was present.

Once the participant was seated, the experimenter read the instructions, answered questions about the procedure, and had the subject sign an informed consent form. These instructions informed the participants that they could expect to perform several drawing tasks and respond to two brief questionaires while their "electrodermal activity" was recorded by the "machine in the other room." They were asked to follow the written instructions in the packet carefully, to use a fresh pencil for each drawing task, to hold the hand with electrodes attached as still as possible, and to avoid speaking once they had started. Half of the participants learned that the experimenter would be present, but would not speak. The other half were told that the experimenter would wait in the other room until they had completed the tasks.

The experimenter then attached the electrodes to the first and second fingers of the participant's non-prefered hand. The polygraph was calibrated, and the habituation period was imposed. Once habituation started, the present experimenter remained silent and the absent experimenter left the room. The participant recieved the signal to begin (a knock on the door by a technician) following stability of the resistance level for at least two minutes.

After hearing the signal the participant opened the packet which contained six pages. The participant was asked by written instructions at the top of each page to a) complete a 23 item modified trait anxiety questionaire, b) draw six geometric figures (a warm up task), c) Draw a Person, d) Draw a Car,

e) Draw a Person of the Opposite Sex and f) complete a modified 24 item state anxiety questionaire. These tasks appeared in the packet in the order presented above with the exception of the placement of the state anxiety questionaire. It was systematically placed behind one of the three figure drawings. A note at the bottom of each page reminded the participants to press the event marker button. Due to time and technical limitations, the state and trait anxiety questionaire data will not be analyzed.

RESULTS

Interrater reliability was estimated by computing the Pearson product-moment correlations between raters on each variable for each drawing. These correlations were very similar to those reported by Handler (1967) and Attkinson et al (1974)(see table 1). The reliability estimates ranged between .67 and .97 and had a median of .90.

Insert Table 1 about here

A four factor analysis of variance design was used to evaluate the influences of the independent variables and their interactions on dependent measures (see table 2). All of the factors were completely crossed with the exception of the individual experimenter(I) variable which was nested in the sex of experimenter variable (a specific experimenter cannot be male and female). The individual experimenter variable was treated as a random factor since it sampled a population of potential experimenters and is a non-replicable factor in future research. The other three variables were treated as fixed factors. F-tests of main and interaction effects for the presence/absence of the experimenter(A), sex of experimenter (E), and sex of participant(P) were initially based upon error terms with only four degrees of freedom. Power was increased for these tests by using a pooled error term and thereby increasing degrees of freedom. Appendix II explains the pooling procedure in detail.

Insert Table 2 about here

All of the F-tests for the main effects of presence/absence of the experimenter were converted to t-tests. One tailed t-tests were performed for all of the graphic indexes which had previously differentiated high and low performance anxiety conditions in the Handler and Reyher study (1964). The t-values were considered to be significant only if they were in the same direction as the Handler and Reyher results. Two tailed t-tests were performed for the rest of the variables i.e. those variables which were either not included or did not differentiate testing conditions in the Handler and Reyher (1964) study.

Replication of Handler and Reyher (1964). The results of thi study replicated Handler and Reyher's (1964) finding that human figure drawings are affected by the external situation and by the internal processes that are activated by drawing the human anatomy in an interpersonal context. Table 3 summarizes the findings for the presence/absence of the experimenter and compares them to the Handler and Reyher (1964) results. The presence/ absence of the experimenter significantly affected six drawing indexes on the person drawing and seven drawing indexes on the opposite sex person drawing. Only two of the drawing indexes for the car figure were affected. Only the graphic indexes specified by either hypothesis I or Hypothesis II differentiated the experimenter present from the experimenter absent conditions.

Hypothesis I. The results provided strong support for Hypothesis I which predicted directional effects due to presence/ absence of the experimenter on all three drawings for all of the dependent variables that were assumed to be primarily sensitive to externally induced anxiety. With the exception of head simplification for the opposite sex person drawing and delineation line absence for the car drawing, the six graphic indexes specified by Hypothesis I were significantly affected by the presence/ absence of the experimenter on all drawings for which these indexes were rated. All effects were in the expected direction. In addition to the main effects for presence/absence of the experimenter, four of these graphic indexes were qualified by significant interactions which included presence/ absence as one of the factors for particular figure drawings. These were erasure, delineation line absence, and head simplification on the person drawing and shading on the car drawing. A description of the interactions for erasure and delineation line absence will not be provided here since they are both described in a later section. A significant present/absent by sex of participant (AxP) interaction occured for head simplification on the person drawing. Head simplification was greater for female participants when an experimenter was present, but about the same for female participants when the experimenter was absent or for male participants regardless of whether the experimenter was present or absent. Shading on the car figure had a significant IxAxP interaction. Since shading on the car figure is of little interest, it will not be described here. Neither GSR measure was significantly affected by the presence/absence of the experimenter during any of the drawings, but the amount of time spent did significantly differentiate the present from the absent conditions on all three drawings. When the experimenter was present, participants typically spent 40 to 60 seconds less than when the experimenter was absent.

Hypothesis II. The results provided partial support for Hypothesis II which predicted directional effects due to presence/absence of the experimenter on human figure drawings only for variables that were assumed to be primarily sensitive to intrapsychic processes activated by drawing the human anatomy in an interpersonal context. Both vertical imbalance and reinforcement were were significantly affected by presence/absence of the experimenter for the opposite sex person figure drawing. However, neither of these indexes was significantly affected on the person or car drawings.

Although delineation line absence was predicted to differentiate present and absent conditions on all three drawings , it did so only for the human figures. Consequently, it might also be considered to be affected primarily by the anxiety producing intrapsychic processes that were activated by the drawing task. However, the rating procedures used to rate the car figure may not have been similar enough to the procedures used to rate the human figures to draw that conclusion. None of the other variables differentiated the present and absent conditions for the human figures only.

<u>Other Findings</u>

Twenty-three F-tests for the other main effects (E, P, and I) and interactions (AxF, AxP, ExP, AxExP, IxA, IxP, IxAxP) were significant. Five of these have important implications for the present study, and the remaining 18 are of secondary interest. Since these latter findings are so numerous, they will not be presented here. The interested reader will find a description of these findings in Appendix IV.

The five significant findings refered to above were all significant AxExP interactions for the mean conductance levels during all three drawings and for erasure and delineation line absense on the person drawing. These findings are especially germane because they reflect the effects of the interpersonal situation on the participant's anxiety level. Figure 1 demonstrates the remarkable consistancy of this interaction across the three drawing tasks for mean conductance. During all three drawings, when the experimenter was present the participants experienced higher levels of sympathetic nervous system (SNS) acticvation (anxiety) when tested by opposite sex experimenters than when tested by same sex experimenters. However, when the experimenter was absent, participants experienced higher SNS activation when tested by same sex experimenters than when tested by opposite sex experimenters.

Figures 2 and 3 demonstrate that the AxExP interaction for erasure and for delineation line absence were strikingly similar to the AxExP interactions for mean conductance. The increased elevation in the present condition for both drawing indexes was reflected by the significant main effect for A on both variables.

DISCUSSION

Overall, Handler and Reyher's (1964) findings that human figure drawings are affected by two sources of anxiety were replicated by the results in the present study. As was anticipated the presence of an experimenter resulted in a number of graphic and stylistic changes in the figure drawings of the participants. Almost all of the drawing indexes that were hypothesized to be primarily sensitive to external sources of anxiety (Hypothesis I) were affected for each drawing (13 out of 15). However, findings were less clear for the two indexes that were hypothesized to be sensitive to internal sources of anxiety which are activated by the interpersonal task of drawing the human anatomy. Since both indexes were significantly affected by the presence/absence of an experimenter on the opposite sex figure rejection of Hypothesis II is not warented at this time. The pattern of results for the graphic indexes and time variables confirmed Handler and Reyher's (1964) speculation that participants react to the anxiety producing characteristics of the figure drawing situation by finishing as quickly as possible and leaving (flight). The participants who were observed spent approximately fourty to sixty seconds less on each drawing than participants who were not observed. Likewise, the differences on the graphic indexes reflected less "effort, articulation, and detail" in the drawings of observed participants, Since the observed participants spend less time drawing, the drawing indexes probably reflect less opportunity to improve on and add detail to the drawing.

The findings for the GSR mean conductance indicated that observed participants did not flee the situation because of feelings of high anxiety. None of the mean conductance measures had a significant main effect for the presence/absence of the experimenter. If flight from the situation was motivated by the desire to reduce high anxiety, then sympathetic nervous system activation should have been consistantly higher across tasks for observed participants. Although these GSR variables were not directly affected by the presence of an experimenter they were affected by fascinating interactions. Results for mean conductance indicated that when participants were observed, they were more anxious in the presence of opposite sex experimenters.

However, when participants were not observed, they were more anxious when tested by same sex experimenters.

The implications of these interactions are elucidated when considered from the framework of Duval and Wicklund's (1972, Wicklund, 1975) theory of objective self awareness. According to this theory, concious attention is directed either entirely toward the self or toward external events in the environment. Particular stimuli, such as a mirror or a tape recording of the participants voice, focus a person's attention on some dimension of self i.e. results in objective self awareness. All other stimuli distract attention away from self and toward the environment. When attention is directed toward some dimension of self, the result is self evaluation of the discrepancy between attainment and aspiration on that dimension. If this discrepancy is positive (typically due to a recent success experience), then a person should experience positive affect and will seek out situations that stimulate objective self awareness (approach response). However, if the discrepancy is negative, an individual will experience negative affect and will actively attempt to avoid stimuli which result in objective self awareness. In situations where the discrepancy is negative and objective self awareness is inescapable, the person will attempt discrepancy reduction. The degree of affect that is experienced is considered to be a joint function of the degree of the discrepancy and the proportion of attention focused on that discrepancy during a time interval.

In this study, objective self awareness was probably induced by the procedure of recording Galvanic Skin Resistance. Most of the participants, if not all, were aware that some aspect of their internal state was being monitered since electrodes were attached by finger clamps to their non-prefered hand. If objective self awareness was induced in both observed and non-observed participants, then why did these groups differ on a number of variables? Wicklund (1975) argued that the presence of an audience results in objective self awareness when the person realizes that the attention of the audience is focused on some feature of self. Consequently, observed participants may have simply reacted to two stimuli (polygraph and observer) that induce objective self awareness rather than just one (polygraph). However, the pattern of the interactions for GSR mean conductance suggest a slightly different interpretation ; The presence of an observer appeared to alter the dimension upon which self evaluation occurs. A brief description of the situation of this experiment will help to make this point.

The participants were probably representative of eighteen to twenty-two year old undergraduates who attend introductory psychology courses at a large state university. In the laboratory situation they were met by complete strangers, who were approximately the same age or slightly older. They were asked to perform a task that should result in a large negative discrepancy between actual and ideal performance for most participants. Thus participants were faced with the situation of trying to create a favorable impression in the eyes of a stranger while performing a task that they probably do not do well.

When participants were observed, their sympathetic nervous system activation was higher in the presence of opposite sex experimenters than in the presence of same sex experimenters. This suggests that the dimension of evaluation of their objective self awareness was their appeal or acceptability to the experimenter. This was inferred because in this period of their life most college students have major concerns about their sexual appeal to and ability to develop relationships with members of the opposite sex. Thus anxiety was greater when opposite sex experimenters were present because participants were more anxious about being accepted by a strange member of the opposite sex. Since there was little opportunity for the participant to speak, they could only impress the observer with their physical appearance and their performance on the drawing task. Since self evaluation on both dimensions was likely to result in a negative discrepancy, the participants needed to avoid negative affect. In addition to focusing awareness upon their acceptability to the experimenter, the presence of an observer also effectively prevented the participant from avoiding self awareness while in the situation, Consequently, the participants had to finish quickly and leave because of their inability to successfully distract their attention away from self.

When participants were not observed, they were more anxious when they had same sex experimenters than when they had opposite sex experimenters. This suggest that objective self awareness was focused primarily on their ability to perform the drawing task rather than on their acceptability or appeal to the experimenter. This inference is based on the assumption that college students at this age tend to be more competative with members of the same sex. Thus participants were more anxious because they feared the critisizm of the same sex experimenter more than the critisizm of the opposite sex experimenter. Since an observer was not present, participants were able successfully to focus attention outward by attending to the task i.e. the actual mechanics of drawing the figures absorbed their attention and prevented focus on self. Thus they spent more time drawing, because they could avoid objective self awareness and because they wanted to improve their performance and thereby reduce the discrepancy between actual and ideal performance.

Some of the most useful findings in this study occured for the erasure and delineation line absence indexes. Both of these were qualified by significant AxExP interactions on at least one drawing variable that strongly resembled the AxExP interactions for mean conductance described above. However, they also had significant main effects for the presence/absence of the experimenter. This pattern of findings indicates that both erasure and delineation line absence on the person drawing have two different determinants. Both appear to be sensitive to the participants anxiety that is induced by the interpersonal context and to the amount of time spent in the situation (avoidant defense).

The results of this study have strong implications for future research on the validity of the Draw a Person test (DAP) as a personality assessment instrument. Major literature reviews have consistently reported mixed or negative findings for studies that attempted to document the relationship between particular aspects of personality and drawing variables (Swenson, 1957, 1968; Roback, 1968; Handler and Reyher, 1965). The current findings provide further confirmation for Handler and Reyher's (1965) suggestion that inconsistancies in the DAP research results were the product of a lack of understanding about and control over situational effects on drawing performance. The major implication for future research on the DAP is that the relationships between particular aspects of personality and drawing variables may be obscured if testing conditions result in participants finishing the drawings quickly and fleeing the situation. When participants rush to complete the drawing tasks, they leave impoverished drawings that tend to have little variation between participants on a number of indexes that are believed to be indicative of aspects of personality. When testing conditions are arranged that encourage participants to invest time and effort in the drawing task, variation between participants on these drawing variables tends to increase. The greater degree of variation between participants should reduce restriction of range problems in correlation studies and thereby increase the likelihood that significant relationships may be found.

The results of this study also have major implications for the use of the DAP in other research settings. As a research instrument, the DAP is valuable because a variety of variables (Handler's graphic indexes of anxiety) are easily measured, highly reliable, and highly sensitive to particular types of situational manipulations. As a research methodology, the Draw a Person test procedure has high potential, because it effectively creates a situation that heightens anxiety about performaing adequately. Thus it is a particularly useful procedure for studying the effects of a variety of interpersonal and situational variables on performance.

The clinical implications of this study are numerous. First of all, the DAP can be used to assess a client's ability to cope with an anxiety producing situation. The clinician could obtain drawings under conditions that are likely to provoke a flight response and under conditions that encourage the investment of time and effort in the drawings. Traditional personality interpretations may be made from the latter set. Comparisons of the two sets of drawings on the anxiety indexes that are sensitive to situational manipulations and on the amount of time taken to complete all drawings should provide valuable information about the client's ability to cope with anxiety producing situations. When drawings from both sets show effort and adequate detail, the diagnostic conclusions might be either excessive concerns about performance, or a general ability to cope with situationally produced anxiety. When the drawings obtained in the high anxiety situation are impoverished and the ones obtained in the low anxiety situation show greater effort and detail, then the clinician might conclude that the client has difficulty in coping with an interpersonal situation that made him or her anxious. Furthermore, the client's response was to avoid the situation by leaving. When drawings are impoverished in both situations, the implications might be either strong resistance to being assessed or excessive anxiety induced by the process of drawing the human anatomy.

Comparisons of drawings obtained when the assessor is present and when the assessor is absent might provide valuable information about the client's ability to focus on self when in the presence of a therapist. The ability of the client to tolerate objective self awareness in the Draw a Person test situation while being observed might serve as an effective predictor of whether that client would be able to tolerate the strong anxiety inducing process that occurs from the intensive self focus in insight oriented psychotherapies.

A final implication is that this study clearly demonstrates that the assessor should always consider the influences of the conditions of testing when clinically interpreting the DAP. Failure to consider the effects of the interpersonal situation on projective test performance can easily result in confused and inappropriate interpretations. The methodology of comparing figure drawings obtained in different situations and of comparing human figure drawings to the relatively neutral car figure drawing should facilitate the process of determining whether the source of variation in human figure drawings is situational or intrapsychic.

Table 1

Comparison of Pearson Correlations Between Raters on All Drawing Variables for Each Drawing with Interrater Correlations from Previous Studies.

	Previous Studies			Present Study		
	A	B	C			
Variable Name	All	All	All	Per	OSPer	Car
Shading	.90	.93	.83	.88	.82	.85
Erasures	.91	.87	.93	.91	.69	.78
Delin. Line Abs	.89	.80	.90	.97	.96	.81
Body Simp.	.71	.73	.76	.83	.81	—
Head Simp.	.88	.80	.86	.89	.82	—
Vert. Imballance	.91	.70	.90	.82	.77	.77
Reinforcement	.76	.94	.77	.94	.88	.84
Hair Shading	.87	.87	.90	.95	.90	—
Placement	1.00	—	—	.94	.90	.95
Line Discont.	.84	.97	.67	.91	.91	.78
Omission	.90	.92	.87	.94	.94	.97
Transparancy	.74	.97	.97	.83	.66	.81
Body Size	.94	—	—	.97	.94	—
Head Size	.99	—	—	.96	.95	—
Head:Body Ratio	.95	—	—	.87	.90	—
Vert. Size	—	—	—	—	—	.93
Horz. Size	—	—	—	—	—	.96

A= Attkisson, Waidler, Jeffrey, and Lambert (1974)
B= Handler (1963)
C= Handler and Reyher (1964)

Table 2

Specification of the Analysis of Variance Design Including Degrees of Freedom, Error Terms, and Nesting Information.

Source	Symbol	DF	Nesting	Error Term
Sex of Experimenter	E	1		I
Presence/Absence of F	A	1		IxA
Pres/Abs by Sex of E	AxE	1		IxA
Sex of Participant	P	1		IxP
Sex of P by Sex of E	PxE	1		IxP
Sex of P by Pres/Abs	PxA	1		IxAxP
Sex of P by Pres/Abs by Sex of E	PxAxE	1		IxAxP
Individual Experimenter	I	4	E	S
Ind E by Sex of P	IxP	4	E	S
Ind E by Pres/Abs	IxA	4	E	S
Ind E by Pres/Abs by Sex of P	IxAxP	4	E	S
Subjects	S	72	IxExAxP	none

Table 3

Significant Results for the Main Effect of Presence/Absence of the Experimenter in the Present Study and for High and Low Performance Anxiety Testing Conditions in Handler and Reyher (1964) Study. Significant one tailed (1) and two tailed (2) T-tests are reported.

	Handler and Reyher			Present Study		
Variable Name	Male	Female	Auto	Per	OSper	Car
Time	N/A	N/A	N/A	2	2	2
Mean Conductance	N/A	N/A	N/A			
Frequency Rate	N/A	N/A	N/A			
Shading	2	2	2	1	1	1
Erasures	2	2	2	1	1	1
Delin. Line Abs.	2@	2	2	1	1	
Body Simp.	2	2	2	1	1	N/A
Head Simp.	2	2	N/A	1		N/A
Vert. Imballance	2	2			1	
Reinforcement	2	2@			1	
Hair Shading	2	2@	N/A	1	1	N/A
Placement	2					
Line Disc.	2					
Omission	2		2			
Transparancy						
Body Size	2*					N/A
Head Size			N/A			N/A
Head:Body Ratio			N/A			N/A
Vertical Size(Car)	N/A	N/A	N/A	N/A	N/A	
Horizontal Size	N/A	N/A	N/A	N/A	N/A	
Vert:Horz Ratio	N/A	N/A	N/A	N/A	N/A	

N/A Not applicable for this variable since a test was not performed.

@ Significant at $p < .10$; All other Handler and Reyher (1964) results were significant at $p < .05$.

* Significantly smaller in high performance anxiety condition when tested in that situation first. However, they were significantly larger when tested in the low performance anxiety condition first.

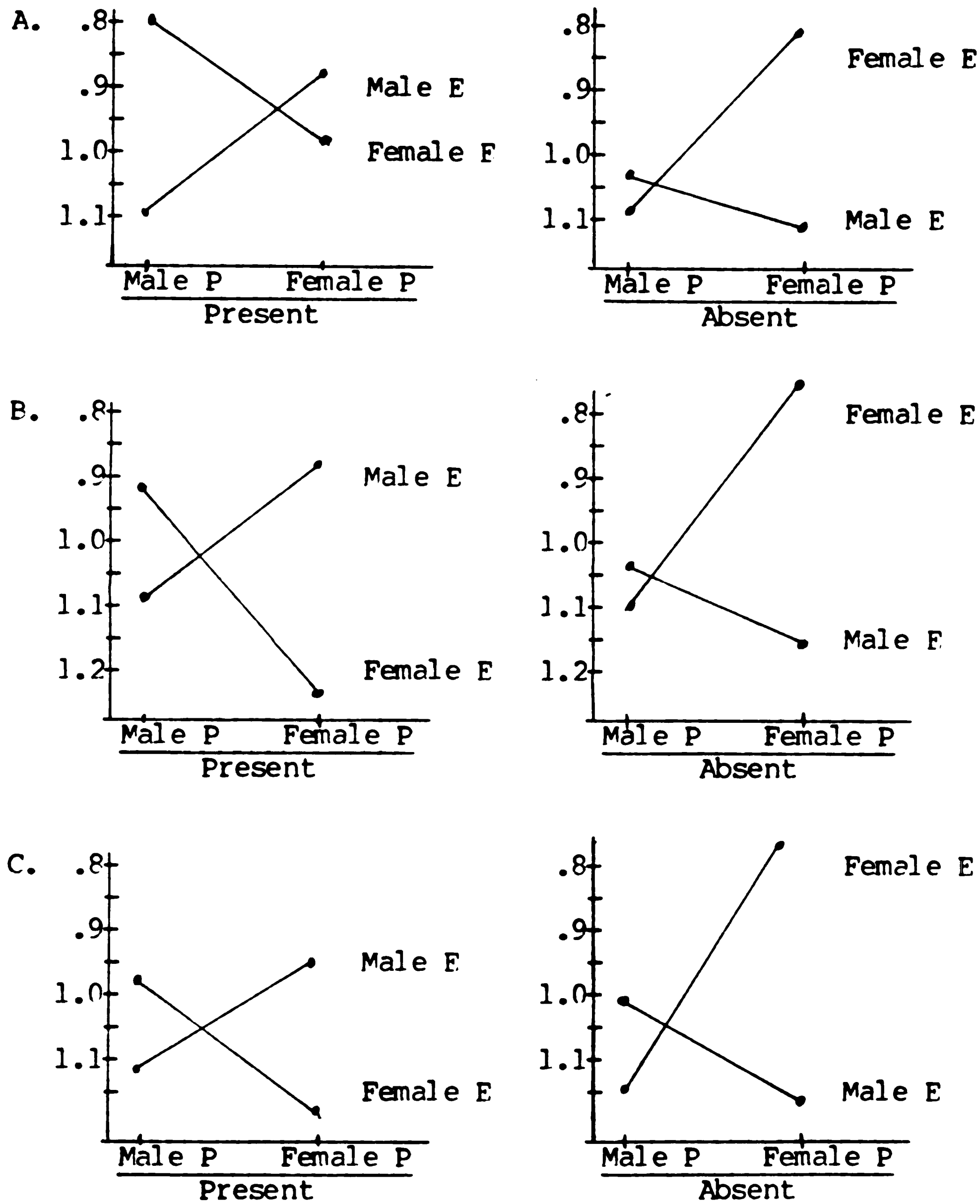

Figure 1. Graphic presentation of the Present/Absent by Sex of Experimenter by Sex of Participant Interaction (AxExP) for the mean conductance level of subjects during the A. person figure drawing, B. car figure drawing, and C. opposite sex person figure drawing.

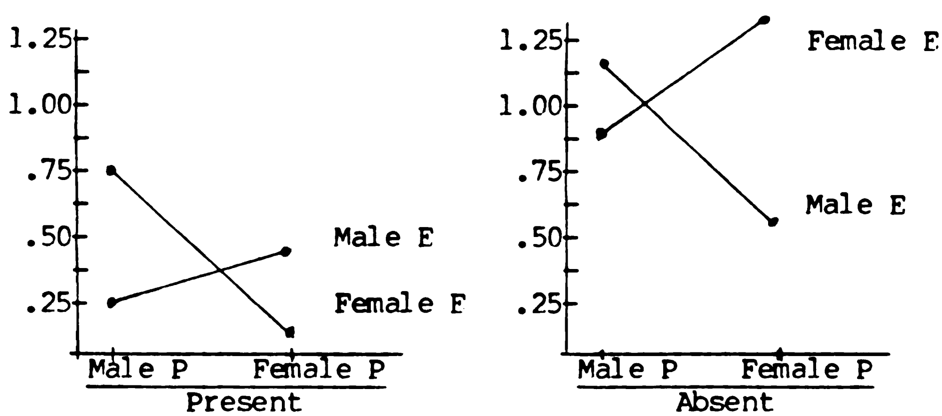

Figure 2. Graphic presentation of the Present/Absent by Sex of Experimenter by Sex of Participant interaction (AxExP) for the number of erasures for the person figure drawings.

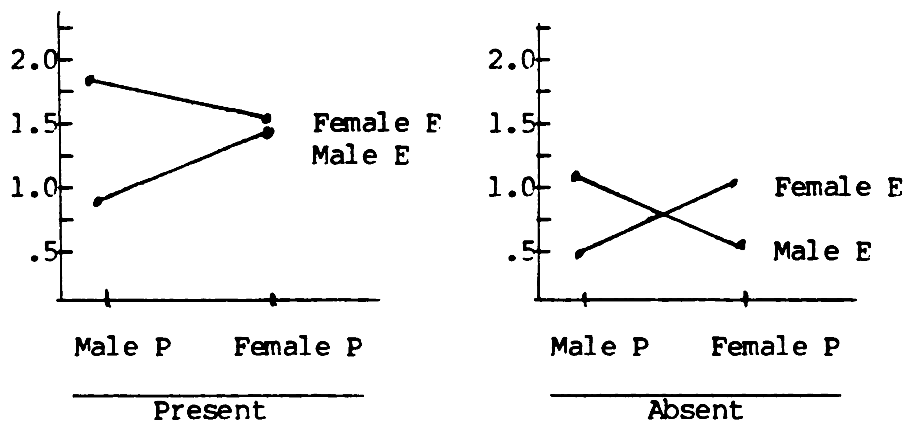

Figure 3. Graphic presentation of the Present/Absent by Sex of Experimenter by Sex of Participant interaction (AxExP) for Delineation Line Absences on person figure drawings.

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APPENDIX I

Appendix I contains the scoring criteria for the twelve variables that were used in rating the car figure drawing. An attempt was made to construct scoring criteria which would approximate Handler's (1967) procedures for rating human figure drawings as closely as possible. The major problem in the construction of analogous scales occurred for human figure drawings that require separation of the body into parts. Handler (1967) divides the body into several areas, 1) head (including facial features), 2) neck, 3) one or both hands, 4) one or both feet, 5) one or both legs, 6) one or both arms and, 7) trunk. Following several attempts, a system was developed for dividing the car into five distinctive areas: 1) The area forward of a vertical line drawn tangentiallly to the front edge of the front tire (typically includes the front bumper, head lights, grill, and part of the hood), 2) The area backward of the vertical line drawn tangentially to the back edge of the back tire (typicallly includes the back bumper, tail pipe, tail lights, and part of the trunk) 3) The area above a horizontal line that is drawn between the point where the wind shield meets the hood, and the point where the back window meets the trunk (typically includes all windows and roof) 4) one or both tires, and 5) the remainder of the car (corresponds to the trunk of the human figure). Division of any one of these five areas into two lesser areas did not add additional precision to the measurement process. During the training for erasures index, the raters kept track of each incident of finding two erasures in one car area. It was quite rare to find two erasures in one area, although it was not rare to find more than one erasure on a drawing. Combination of two areas into one did seem to result in a loss of precision in the measure though. Other problems in the development of analogous indexes will be discussed when the scales are presented.

I. Shading

Shading within any essential car area is scored. A design or emblem or any consistent pattern of lines, (e.g. cross hatching) is scored as shading. Exhaust smoke is also scored as shading.

Score 0 when there is no shading.

Score 1 when there is shading on any one car area.

Score 2 when there is shading on any two car areas.

Score 3 when there is shading on more than two car areas.

II. Erasure

An erasure on any car area is scored.

Score 0 when there are no erasures.

Score 1 when there is erasure on any single car areas.

Score 2 when there is erasure on any two car areas.

Score 3 when there is erasure on three or more car areas.

III. Delineation Line Absence

This index refers to the absence of lines on the car that divide it into various parts. The extreme case is a car figure that is merely an outline, or a shell. The drawing was scored for the presence of 1) at least one vertical line that delineates a window, 2) at least two vertical lines that delineate a car door, and 3) lines that connect the tires to the car. Other possible delineation lines were judged to have occurred too infrequently to be of use in differentiating performance.

Score 0 if all three criteria are met.

Score 1 if one of the criteria is not met.

Score 2 if two of the criteria are not met.

Score 3 if all of the criteria are not met.

IV. Vertical Imbalance

The angle formed by the bottom edge of the protractor (which was parallel to the horizontal edge of the paper) and a line which passed along the bottom side of the car was measured. The number of degrees that deviated from the 0 degree mark was counted.

Score 0 if figure has less than a 2 degree deviation.

Score 1 if the figure has a deviation between 2 1/2 and 8 1/2 degrees.

Score 2 if the figure has a deviation between 9 and 17 degree

Score 3 if the figure has a deviation greater than 17 degrees

V. Reinforcement

Reinforcement consists of retracing of lines (lines that have been redrawn, or gone over). This does not include shading. Reinforcement is often confused with sketchiness of a line. Some subjects habitually draw using a sketchy line and therefore if most of the drawing is sketchy, reinforcement should not be scored. Also, lines that have been erased and redrawn with a single line should not be scored as reinforcement.

Score 0 if less than a quarter of the figure is reinforced.

Score 1 if approximately a quarter of the figure is reinforce

Score 2 if approximately half of the figure is reinforced.

Score 3 if approximately three-quarters or more of the figure is reinforced.

VI. Placement

The drawing receives points depending on where the figure lies in relation to the vertical and horizontal axis. For the vertical axis, the car figure receives 0 points if the vertical axis passes entirely between both tires, 1 point if it touches either tire, 2 points if it falls outside of the tires but still passes through the car, and 3 points if it does not intersect the car. For the horizontal axis, the car figure receives 0 points if it passes between line A (the line that separates the windows and roof from the car body) and line B (the line that runs along the bottom of the car); 1 point if it passes above line A or below line B while still touching part of the car, and 2 points if it does not intersect with the car at any point. These points are summed for the two axes.

Score 0 for 0 points.

Score 1 for 1 point.

Score 2 for 2 points.

Score 3 for 3 or more points.

VII. Line Discontinuity

Line Discontinuity refers to the frequency of broken lines used in the drawing, and to the spaces left between various body parts. On careful inspection these body parts may show them to be unconnected A line discontinuity is scored if it is possible to go from the outside of the car body wall to the inside of the car body wall without crossing a body line. If the drawing is done with a sketchy line it is difficult to determine whether line discontinuity is to be scored. Line discontinuity should not be scored if, despite the sketchiness, it is impossible to go ffom the outside of the car body wall to the inside without crossing a body line.

Score 0 if there are no more than three line discontinuities in a drawing

Score 1 if four or five line discontinuities are present.

Score 2 if six, seven, or eight line discontinuities are present.

Score 3 if nine or more line discontinuities are present.

VIII. Omission

Score if there is an omission of any essential car area or when the figure is placed so that one or more essential car body areas has been cut off by the edge of the paper (paper-chopping).

Score 0 if there are no omissions.

Score 1 if one car body part is omitted.

Score 2 if two car body parts are omitted.

Score 3 if three or more car body parts are omitted.

IX. Transparancies

Transparency is scored when part of a car body area which ordinarily is not visible due to the structure of the automobile is visible in the drawing (e.g., ability to see the tires through the fender).

Score 0 if there are no transparencies in the drawing.

Score 1 if one transparency is present.

Score 2 if two transparencies are present.

Score 3 if three or more transparencies are present.

X. Horizontal Size

This index was not directly related to the human figure drawing index for body size since the car figure is typically wider than it is tall. New cutoff points had to be set in order to reduce it to a four point scale. These points were selected on the basis of two criterea: 20% of the participants should be in each of the 0 and 3 point groups and 30% of the participants should be in the 1 and 2 point groups, and 2) this distribution should be symetrical about the mean of the distribution. Horizontal size was measured by placing an axis line along the bottom of the car. Perpendicular lines were extended to the farthest points in the left and right of the car. The distance between these perpendicular line was measured to the nearest 1/16th of an inch.

Score 0 if the horizontal distance is between 4 and 5/8 and 5 and 5/16 inches.

Score 1 if the horizontal distance is between 5 and 3/8 and 6 and 3/8 inches.

Score 1 if the horizontal distance is between 3 and 9/16 and 4 and 11/16 inches.

Score 2 if the horizontal distance is between 6 and 7/16 and

7 and 1/8 inches.

Score 2 if the horizontal distance is between 2 and 1/2 and 3 and 1/2 inches.

Score 3 if the horizontal distance is greater than 7 and 3/16 inches.

Score 3 if the horizontal distance is less than 2 and 7/16 inches.

XI. Vertical Size

Vertical size is measured by placing a line tangential to the bottom of both tires. A perpendicular axis was constucted at the midpoint of this line. A perpendicular line was then drawn between the axis and the highest point on the roof of the car. The distance between the two parellel lines along the axis was then measured.

Score 0 if the vertical distance is between 1 and 3/4 and 2 and 1/8 inches.

Score 1 if the vertical distance is between 2 and 3/16 and 2 and 7/16 inches.

Score 1 if the vertical distance is between 1 and 1/2 and 1 and 11/16 inches.

Score 2 if the vertical distance is between 2 and 1/2 and 3 and 1/8 inches.

Score 2 if the vertical distance is between 1 and 1/16 and 1 and 7/16 inches.

Score 3 if the vertical distance is greater than 4 and 1/8 inches.

Score 3 if the vertical distance is less than 1 inch.

XII. Vertical:Horizontal Ratio

The vertical:horizontal ratio is measured by dividing the vertical distance by the horizontal distance. This variable was not recoded into four categories like the others, but left in its raw form.

APPENDIX II

In this design each of the mean squares which involved the individual experimenter variable (hereafter known as I) served as error terms for the F-tests of the main and interaction effects of sex of experimenter (E), presence/absence of the experimenter (A), and sex of the participant (G). Specifically, the error term for E was I, for A and AxE it was IxA, for P and ExP it was IxP, and for AxP and AxExP it was IxAxP. The mean squares for participants (residual variance) served as the error term for all F tests which involved the individual experimenter variable (I, Ixa, IxP, IxAxP). This design resulted in limited power for F-tests of A, E, P and their interactions since mean squares involving I were all based on only four degrees of freedom/ Power for these F-tests was increased by pooling appropriate error terms and thereby increasing the degrees of freedom. For each analysis the pooled error term was formed by adding the sums of squares for participants (residual variance) and the sums of squares of all effects involving I that were not significant at $p<.25$. The pooled mean square was then produced by dividing this sum by the sum of the degrees of freedom for each included term. New F-ratios were then computed by dividing the mean squares of the A, E, and P main effects and interactions by the pooled mean square if the F-tests of these effects had been previously based on an error term that was included in the pooling. If one of these F-tests was based on an error term that was not included in the pooling (the F-test for that error term was significant at $p<.25$), then that F-test was not recalculated using the Pooled term. In this case the orriginal denominator was larger than the pooled error term and therefore provided a more conservative test.

APPENDIX III

Table 4

Mean Squares and F-Ratios of Time Spent for Each Drawing

	PERSON DRAWING		OS PERSON DRAWING		CAR DRAWING	
SOURCE	MS(5)a	F-RATIO	MS(5)	F-RATIO	MS(5)	F-RATIO
E	0.000	.00@	0.037	NS	0.020	NS
A	1.030	7.12***	1.588	7.61***	0.526	6.21***
AxE	0.017	NS	0.072	NS	0.014	NS
P	0.462	NS	0.963	4.61*	0.506	NS
PxE	0.006	NS	0.079	NS	0.027	NS
PxA	0.053	NS	0.039 x	NS	0.246	NS
PxAxE	0.148	NS	0.027 x	NS	0.089	NS
I	0.100	NS	0.201	NS	0.064	NS
IxP	0.036	NS	0.107	NS	0.101	NS
IxA	0.089	NS	0.109	NS	0.050	NS
IxAxP	0.137	NS	0.450	2.04#	0.051	NS
RESIDUAL	0.157	—	0.220	—	0.089	—

a Mean square was multiplied by ten raised to the power indicated by the number in the parentheses.

* Significant at p=.05.

** Significant at p=.025

*** Significant at p=.01

@ F-test is significantly small at p=.95

\# Significant at p=.25, thus not included in the pooling procedure.

x F-test is not based on the pooled error term and df=1,4.

Table 5

Mean Squares and F-Ratios for Mean Conductance during Each Drawing

	PERSON DRAWING		OS PERSON DRAWING		CAR DRAWING	
SOURCE	MS(-7)a	F-RATIO	MS(-7)	F-RATIO	MS(-7)	F-RATIO
E	3.079	NS	0.128	NS	0.386	NS
A	1.387 x	NS	0.517	NS	0.161	NS
AxE	0.060 x	NS	5.349	NS	1.344	NS
P	0.613	NS	0.001	.00@	0.446	NS
PxE	0.094	NS	0.257	NS	0.285	NS
PxA	0.185	NS	2.327	NS	0.827	NS
PxAxE	6.917	5.53**	12.358	5.03*	11.124	7.24**
I	1.344	NS	3.200	NS	3.285	NS
IxP	1.587	NS	2.971	NS	1.294	NS
IxA	2.609	1.99#	3.034	NS	1.080	NS
IxAxP	0.935	NS	2.703	NS	1.847	NS
RESIDUAL	1.307	—	2.376	—	1.637	—

a Mean square was multiplied by ten raised to the power indicated by the number in the parentheses.

* Significant at p=.05.

** Significant at p=.025

*** Significant at p=.01

@ F-test is significantly small at p=.95

Significant at p=.25, thus not included in the pooling procedure.

x F-test is not based on the pooled error term and df=1,4.

Table 6

Mean Squares and F-Ratios for Frequency Rate during Each Drawing

	PERSON DRAWING		OS PERSON DRAWING		CAR DRAWING	
SOURCE	MS(-2)a	F-RATIO	MS(-2)	F-RATIO	MS(-2)	F-RATIO
E	0.111	NS	0.011	NS	0.065	NS
A	0.876 x	NS	0.628	NS	0.013	NS
AxE	0.613 x	NS	0.008	NS	0.065	NS
P	1.540	NS	0.000	.00@	0.011	NS
PxE	0.236	NS	0.434	NS	1.337	NS
PxA	0.203	NS	0.002	NS	0.229	NS
PxAxE	0.081	NS	0.081	NS	0.161	NS
I	0.328	NS	0.579	2.78*	0.114	NS
IxA	1.651	2.78*	0.335	1.61#	0.378	NS
IxP	0.321	NS	0.335	NS	0.378	NS
IxAxP	0.195	NS	0.121	NS	0.221	NS
RESIDUAL	0.594	—	0.209	—	0.372	—

a Mean square was multiplied by ten raised to the power indicated by the number in the parentheses.

* Significant at p=.05.

** Significant at p=.025

*** Significant at p=.01

@ F-test is significantly small at p=.95

\# Significant at p=.25, thus not included in the pooling procedure.

x F-test is not based on the pooled error term and df=1,4.

Table 7

Mean Squares and F-Ratios of Shading for Each Drawing

	PERSON DRAWING		OS PERSON DRAWING		CAR DRAWING	
SOURCE	MS(0)a	F-RATIO	MS(0)	F-RATIO	MS(0)	F-RATIO
E	0.940	NS	1.898	NS	0.065	NS
A	4.815	8.49***	4.815	5.28**	6.773	4.28**
AxF	0.023	NS	0.128	NS	1.628	NS
P	0.940	NS	3.961	4.34*	1.378 x	NS
PxE	0.128	NS	0.211	NS	0.023 x	NS
PxA	0.065	NS	0.003	NS	0.753 x	NS
AxExP	0.003	NS	2.836	NS	0.211 x	NS
I	0.362	NS	1.021	NS	1.346	NS
IxG	0.221	NS	0.312	NS	3.950	2.48#
IxA	0.747	NS	0.229	NS	1.576	NS
IxAxP	0.253	NS	0.490	NS	4.263	2.67*
RESIDUAL	0.605	—	1.001	—	1.596	—

a Mean square was multiplied by ten raised to the power indicated by the number in the parentheses.

* Significant at p=.05.

** Significant at p=.025

*** Significant at p=.01

@ F-test is significantly small at p=.95

\# Significant at p=.25, thus not included in the pooling procedure.

x F-test is not based on the pooled error term and df=1,4.

Table 8

Mean Squares and F-Ratios of Erasures

for Each Drawing

	PERSON DRAWING		OS PERSON DRAWING		CAR DRAWING	
SOURCE	MS(0)a	F-RATIO	MS(0)	F-RATIO	MS(0)	F-RATIO
E	0.585	NS	0.167	NS	1.148	NS
A	9.065	9.50***	0.010	8.82***	6.253	5.25**
AxE	0.065	NS	0.667	NS	0.219	NS
P	0.586	NS	4.167	NS	2.190	NS
PxE	0.023	NS	0.094	NS	1.378	NS
PxA	0.128	NS	0.667	NS	0.753	NS
PxAxE	4.378	4.59*	0.260	NS	2.503	NS
I	0.224	NS	0.146	.12@	1.591	NS
IxP	0.297	NS	1.130	NS	0.581	NS
IxA	0.229	NS	0.292	NS	0.763	NS
IxAxP	0.448	NS	0.923	NS	0.565	NS
RESIDUAL	1.098	—	1.248	—	1.261	—

a Mean square was multiplied by ten raised to the power indicated by the number in the parentheses.

* Significant at p=.05.

** Significant at p=.025

*** Significant at p=.01

@ F-test is significantly small at p=.95

Significant at p=.25, thus not included in the pooling procedure.

x F-test is not based on the pooled error term and df=1,4.

Table 9

Mean Squares and F-Ratios of Delineation Line Absence for Each Drawing

	PERSON DRAWING		OS PERSON DRAWING		CAR DRAWING	
SOURCE	MS(0)a	F-RATIO	MS(0)	F-RATIO	MS(0)	F-RATIO
E	0.586	NS	2.042 x	NS	1.628	NS
A	9.690	7.22***	3.375	3.60*	0.023 x	NS
AxE	2.503	NS	2.667	NS	0.003 x	.006
P	0.128	NS	0.375	NS	5.273	12.70***
PxE	0.065	NS	1.500	NS	0.023	NS
PxA	0.128	NS	0.167 x	NS	0.440	NS
PxAxE	5.753	4.29*	0.667 x	NS	1.148	NS
I	1.219	NS	1.505	1.56#	0.237	NS
IxP	0.948	NS	0.844	NS	0.305	NS
IxA	1.104	NS	0.302	NS	0.700	1.60#
IxAxP	0.416	NS	1.682	1.74#	0.310	NS
RESIDUAL	1.434	--	0.965	--	0.436	--

a Mean square was multiplied by ten raised to the power indicated by the number in the parentheses.

* Significant at p=.05.

** Significant at p=.025

*** Significant at p=.01

@ F-test is significantly small at p=.95

\# Significant at p=.25, thus not included in the pooling procedure.

x F-test is not based on the pooled error term and df=1,4.

Table 10

Mean Squares and F-Ratios of Body Simplification

for Both Human Figure Drawings.

	PERSON DRAWING		OS PERSON DRAWING		CAR DRAWING	
SOURCE	MS(0)a	F-RATIO	MS(0)	F-RATIO	MS(0)	F-RATIO
E	0.211	NS	0.510	NS	—	—
A	3.190	8.27***	5.042	11.28***	—	—
AxE	0.128	NS	1.042	NS	—	—
P	0.065	NS	0.010	NS	—	—
PxE	0.315	NS	0.844	NS	—	—
PxA	0.128	NS	0.042	NS	—	—
PxAxE	0.234	NS	0.167	NS	—	—
I	0.286	NS	0.307	NS	—	—
IxP	0.151	NS	0.521	NS	—	—
IxA	0.120	NS	0.120	NS	—	—
IxAxP	0.036	.08@	0.448	NS	—	—
RESIDUAL	0.438	—	0.469	—	—	—

a Mean square was multiplied by ten raised to the power indicated by the number in the parentheses.

* Significant at p=.05.

** Significant at p=.025

*** Significant at p=.01

@ F-test is significantly small at p=.95

\# Significant at p=.25, thus not included in the pooling procedure.

x F-test is not based on the pooled error term and df=1,4.

Table 11

Mean Squares and F-Ratios of Head Simplification for Both Human Figure Drawings.

	PERSON DRAWING		OS PERSON DRAWING		CAR DRAWING	
SOURCE	MS(0)a	F-RATIO	MS(0)	F-RATIO	MS(0)	F-RATIO
E	0.094 x	NS	0.094	NS	—	—
A	2.667 x	4.79*	1.041	NS	—	—
AxE	0.167 x	NS	0.260	NS	—	—
P	3.375 x	NS	0.667	NS	—	—
PxE	0.375 x	NS	0.260	NS	—	—
PxA	1.760	4.46*	0.167	NS	—	—
PxAxE	0.260	NS	0.094	NS	—	—
I	0.802	2.02#	0.365	NS	—	—
IxP	0.594	1.49#	0.385	NS	—	—
IxA	0.557	1.40#	0.119	NS	—	—
IxAxP	0.338	NS	0.130	NS	—	—
RESIDUAL	0.398	—	0.441	—	—	—

a Mean square was multiplied by ten raised to the power indicated by the number in the parentheses.

* Significant at p=.05.

** Significant at p=.025

*** Significant at p=.01

@ F-test is significantly small at p=.95

\# Significant at p=.25, thus not included in the pooling procedure.

x F-test is not based on the pooled error term and df=1,4.

Table 12

Mean Squares and F-Ratios of Vertical Imballance for Each Drawing

	PERSON DRAWING		OS PERSON DRAWING		CAR DRAWING	
SOURCE	MS(0)a	F-RATIO	MS(0)	F-RATIO	MS(0)	F-RATIO
E	0.000	.00@	0.042 x	NS	0.327	NS
A	0.094	NS	1.760	2.86*	1.260	NS
AxF	0.167	NS	0.375	NS	1.402	NS
P	0.167 x	NS	0.042	NS	3.010	4.07*
PxE	0.844 x	NS	1.760	NS	0.135	NS
PxA	0.167	NS	2.042	NS	1.084 x	NS
PxAxE	1.760	NS	0.010	NS	0.327 x	NS
I	0.490	NS	0.943	1.50#	0.782	NS
IxP	1.678	2.41#	0.651	NS	0.916	NS
IxA	0.083	.12@	0.239	NS	0.725	NS
IxAxP	0.167	NS	0.729	NS	1.549	2.13#
RESIDUAL	0.696	--	0.627	--	0.728	--

a Mean square was multiplied by ten raised to the power indicated by the number in the parentheses.

* Significant at p=.05.

** Significant at p=.025

*** Significant at p=.01

@ F-test is significantly small at p=.95

\# Significant at p=.25, thus not included in the pooling procedure.

x F-test is not based on the pooled error term and df=1,4.

Table 13

Mean Squares and F-Ratios of Reinforcement

for Each Drawing

	PERSON DRAWING		OS PERSON DRAWING		CAR DRAWING	
SOURCE	MS(0)a	F-RATIO	MS(0)	F-RATIO	MS(0)	F-RATIO
E	0.010	NS	1.042	NS	0.042 x	NS
A	1.260 x	NS	4.594	5.16**	1.500	NS
AxF	0.010 x	NS	0.510	NS	0.375	NS
P	0.260	NS	0.094	NS	0.167	NS
PxF	0.010	NS	0.094	NS	0.042	NS
PxA	0.844	NS	0.167	NS	0.000	.00@
PxAxF	0.010	NS	0.667	NS	0.167	NS
I	0.721	NS	1.060	NS	1.198	1.69#
IxP	0.581	NS	0.383	NS	0.010	.02@
IxA	0.940	1.49#	0.779	NS	0.359	NS
IxAxP	0.747	NS	0.300	NS	0.349	NS
RESIDUAL	0.630	—	0.948	—	0.708	—

a Mean square was multiplied by ten raised to the power indicated by the number in the parentheses.

* Significant at p=.05.

** Significant at p=.025

*** Significant at p=.01

@ F-test is significantly small at p=.95

Significant at p=.25, thus not included in the pooling procedure.

x F-test is not based on the pooled error term and df=1,4.

Table 14

Mean Squares and F-Ratios of Hair Shading

for Both Human Figure Drawings.

	PERSON DRAWING		OS PERSON DRAWING		CAR DRAWING	
SOURCE	MS(0)a	F-RATIO	MS(0)	F-RATIO	MS(0)	F-RATIO
E	0.128	NS	0.375 x	NS	—	—
A	4.378	5.21*	3.010	4.22*	—	—
AxE	2.503	NS	0.167	NS	—	—
P	0.023 x	NS	0.375 x	NS	—	—
PxE	0.128 x	NS	0.094 x	NS	—	—
PxA	1.378	NS	0.000	.00@	—	
PxAxE	1.148	NS	0.844	NS	—	—
I	1.130	NS	1.206	1.71#	—	—
IxP	1.536	1.85#	1.117	1.57#	—	—
IxA	1.010	NS	0.518	NS	—	—
IxAxP	0.490	NS	0.930	NS	—	—
RESIDUAL	0.832	—	0.712	—	—	—

a Mean square was multiplied by ten raised to the power indicated by the number in the parentheses.

* Significant at p=.05.

** Significant at p=.025

*** Significant at p=.01

@ F-test is significantly small at p=.95

\# Significant at p=.25, thus not included in the pooling procedure.

x F-test is not based on the pooled error term and df=1,4.

Table 15

Mean Squares and F-Ratios of Placement
for Each Drawing

	PERSON DRAWING		OS PERSON DRAWING		CAR DRAWING	
SOURCE	MS(0)a	F-RATIO	MS(0)	F-RATIO	MS(0)	F-RATIO
E	4.815	5.92**	0.010	NS	1.148	NS
A	1.148	NS	1.500	NS	1.148	NS
AxE	0.065	NS	0.094	NS	0.315	NS
P	0.440	NS	0.667	NS	0.065	NS
PxE	0.065	NS	1.260	NS	1.898	NS
PxA	0.440 x	NS	0.042	NS	0.023	NS
PxAxE	0.023 x	NS	0.094	NS	0.586	NS
I	0.385	NS	0.260	NS	1.349	NS
IxP	1.104	NS	0.104	.13@	0.474	NS
IxA	0.927	NS	0.156	NS	0.333	NS
IxAxP	1.833	2.25#	0.302	NS	0.281	NS
RESIDUAL	0.815	--	0.797	--	1.095	--

a Mean square was multiplied by ten raised to the power indicated by the number in the parentheses.

* Significant at p=.05.

** Significant at p=.025

*** Significant at p=.01

@ F-test is significantly small at p=.95

\# Significant at p=.25, thus not included in the pooling procedure.

x F-test is not based on the pooled error term and df=1,4.

Table 16

Mean Squares and F-Ratios of Line Discontinuity for Each Drawing

	PERSON DRAWING		OS PERSON DRAWING		CAR DRAWING	
SOURCE	MS(0)a	F-RATIO	MS(0)	F-RATIO	MS(0)	F-RATIO
E	4.594 x	NS	0.510 x	NS	0.510 x	NS
A	7.594 x	NS	0.510 x	NS	0.260 x	NS
AxF	0.510 x	NS	0.010 x	NS	0.260 x	NS
P	0.260	NS	3.010 x	NS	3.010 x	NS
PxF	1.260	NS	0.010 x	NS	0.094 x	NS
PxA	0.094	NS	0.094	NS	0.010	NS
PxAxF	0.094	NS	2.344	NS	0.094	NS
I	3.271	2.08#	2.301	1.84	1.823	2.42#
IxP	1.167	NS	3.073	2.45#	2.177	2.89*
IxA	3.146	2.00#	2.010	1.60#	1.135	1.51#
IxAxP	0.625	NS	1.156	NS	0.615	NS
RESIDUAL	1.573	—	1.254	—	0.753	—

a Mean square was multiplied by ten raised to the power indicated by the number in the parentheses.

* Significant at p=.05.

** Significant at p=.025

*** Significant at p=.01

@ F-test is significantly small at p=.95

Significant at p=.25, thus not included in the pooling procedure.

x F-test is not based on the pooled error term and df=1,4.

Table 17

Mean Squares and F-Ratios of Omissions

for Each Drawing

	PERSON DRAWING		OS PERSON DRAWING		CAR DRAWING	
SOURCE	MS(0)a	F-RATIO	MS(0)	F-RATIO	MS(0)	F-RATIO
E	1.260 x	NS	1.042 x	NS	1.760	NS
A	4.167 x	NS	2.042	NS	0.375	NS
AxE	0.260 x	NS	0.375	NS	0.042	NS
P	2.344 x	NS	0.375 x	NS	0.667 x	NS
PxE	2.042 x	NS	0.667 x	NS	0.167 x	NS
PxA	0.844	NS	0.167	NS	0.094	NS
PxAxE	0.375	NS	0.000	.00@	1.260	NS
I	1.982	1.64#	1.776	1.55#	2.318	NS
IxP	2.294	1.90#	2.849	2.49#	1.893	2.73*
IxA	2.253	1.87#	1.115	NS	0.467	NS
IxAxP	0.836	NS	0.802	NS	0.263	NS
RESIDUAL	1.206	—	1.146	—	0.693	—

a Mean square was multiplied by ten raised to the power indicated by the number in the parentheses.

* Significant at p=.05.

** Significant at p=.025

*** Significant at p=.01

@ F-test is significantly small at p=.95

\# Significant at p=.25, thus not included in the pooling procedure.

x F-test is not based on the pooled error term and df=1,4.

Table 18

Mean Squares and F-Ratios of Transparancies

for Each Drawing

	PERSON DRAWING		OS PERSON DRAWING		CAR DRAWING	
SOURCE	MS(0)a	F-RATIO	MS(0)	F-RATIO	MS(0)	F-RATIO
E	1.898	4.76*	0.094	NS	0.167	NS
A	0.440	NS	0.260	NS	0.094	NS
AxE	0.441	NS	0.375	NS	0.510	NS
P	0.441	NS	1.042	NS	0.260	NS
PxE	0.211	NS	0.094	NS	0.010	NS
PxA	0.003	NS	0.094	NS	0.375 x	NS
PxAxE	0.003	NS	0.042	NS	0.042 x	NS
I	0.521	NS	0.255	NS	0.174	NS
IxP	0.505	NS	0.333	NS	0.628	NS
IxA	0.010	.02@	0.255	NS	0.388	NS
IxAxP	0.245	NS	0.271	NS	1.560	2.58*
RESIDUAL	0.416	—	0.319	—	0.604	NS

a Mean square was multiplied by ten raised to the power indicated by the number in the parentheses.

* Significant at p=.05.

** Significant at p=.025

*** Significant at p=.01

@ F-test is significantly small at p=.95

Significant at p=.25, thus not included in the pooling procedure.

x F-test is not based on the pooled error term and df=1,4.

Table 19

Mean Squares and F-Ratios of Body Size

for Both Human Figure Drawings.

	PERSON DRAWING		OS PERSON DRAWING		CAR DRAWING	
SOURCE	MS(0)a	F-RATIO	MS(0)	F-RATIO	MS(0)	F-RATIO
E	1.500	NS	0.128	NS	—	--
A	0.260	NS	0.023	NS	—	—
AXE	0.167	NS	1.378	NS	—	--
P	0.167	NS	0.586	NS	—	--
PXE	0.094	NS	0.753	NS	—	—
PXA	0.667	NS	0.023	—	--	
PXAXE	1.260	NS	1.898	NS	—	--
I	0.349	NS	0.120	.14@	—	—
IXP	1.161	NS	0.521	NS	—	--
IXA	0.401	NS	0.193	NS	—	—
IXAXP	0.589	NS	0.094	.11@	—	--
RESIDUAL	1.026	—	0.858	--	--	--

a Mean square was multiplied by ten raised to the power indicated by the number in the parentheses.

* Significant at p=.05.

** Significant at p=.025

*** Significant at p=.01

@ F-test is significantly small at p=.95

\# Significant at p=.25, thus not included in the pooling procedure.

x F-test is not based on the pooled error term and df=1,4.

Table 20

Mean Squares and F-Ratios of Head Size

for Both Human Figure Drawings.

	PERSON DRAWING		OS PERSON DRAWING		CAR DRAWING	
SOURCE	MS(0)a	F-RATIO	MS(0)	F-RATIO	MS(0)	F-RATIO
E	3.010	NS	2.667	NS	—	--
A	0.844	NS	2.041	NS	—	--
AXE	0.260	NS	1.042	NS	—	--
P	0.844	NS	0.375 X	NS	—	--
PXE	0.260	NS	0.042 X	NS	—	—
PXA	0.094 X	NS	1.500 X	NS	—	--
PXAXE	1.760 X	NS	0.667 X	NS	—	--
I	0.698	NS	0.396	NS	—	--
IXP	1.302	NS	2.521	NS	—	--
IxA	1.615	NS	0.042	NS	—	--
IXAXP	3.552	2.85*	3.083	NS	—	--
RESIDUAL	1.247	--	1.361	—	--	--

a Mean square was multiplied by ten raised to the power indicated by the number in the parentheses.

* Significant at p=.05.

** Significant at p=.025

*** Significant at p=.01

@ F-test is significantly small at p=.95

\# Significant at p=.25, thus not included in the pooling procedure.

x F-test is not based on the pooled error term and df=1,4.

Table 21

Mean Squares and F-Ratios of Head:Body Ratio

for Both Human Figure Drawings.

	PERSON DRAWING		OS PERSON DRAWING		CAR DRAWING	
SOURCE	MS(0)a	F-RATIO	MS(0)	F-RATIO	MS(0)	F-RATIO
E	0.094	NS	2.042	NS	—	—
A	0.844	NS	0.667	NS	—	—
AxE	0.010	NS	1.042	NS	—	—
P	6.510	7.80***	2.042	NS	—	—
PxE	1.260	NS	0.167	NS	—	—
PxA	5.510 x	NS	3.375 x	NS	—	—
PxAxE	3.010 x	NS	0.000 x	.00@	—	—
I	0.208	NS	0.427	NS	—	—
IxP	0.292	NS	0.260	NS	—	—
IxA	0.833	NS	1.010	NS	—	—
IxAxP	1.292	1.44#	2.844	3.15**	—	—
RESIDUAL	0.899	--	0.903	—	--	--

a Mean square was multiplied by ten raised to the power indicated by the number in the parentheses.

* Significant at p=.05.

** Significant at p=.025

*** Significant at p=.01

@ F-test is significantly small at p=.95

\# Significant at p=.25, thus not included in the pooling procedure.

x F-test is not based on the pooled error term and df=1,4.

Table 22

Mean Squares and F-Ratios of Vertical and Horizontal Size and Vertical:Horizontal Ratio for the Car Drawing

	PERSON DRAWING		OS PERSON DRAWING		CAR DRAWING	
SOURCE	MS(0)a	F-RATIO	MS(0)	F-RATIO	MS(0)	F-RATIO
E	3.010	NS	2.667	NS	0.007 X	NS
A	0.844	NS	2.042	N022	NS	
AXE	0.260	NS	1.042	NS	0.021	NS
P	0.844	NS	0.375 X	NS	0.125	6.12**
PXE	0.260	NS	0.042 X	NS	0.046	NS
PXA	0.094 X	NS	1.500 X	NS	0.030	NS
PXAXE	1.760 X	NS	0.667 X	NS	0.000	NS
I	0.698	NS	0.396	NS	0.044	1.98#
IXP	1.302	NS	2.521	1.85#	0.004	.17@
IXA	1.615	NS	0.042	.03@	0.008	NS
IXAXP	3.552	2.85*	3.083	2.26#	0.009	NS
RESIDUAL	1.256	—	1.361	—	0.022	NS

a Mean square was multiplied by ten raised to the power indicated by the number in the parentheses.

* Significant at p=.05.

** Significant at p=.025

*** Significant at p=.01

@ F-test is significantly small at p=.95

\# Significant at p=.25, thus not included in the pooling procedure.

x F-test is not based on the pooled error term and df=1,4.

APPENDIX IV

Appendix IV contains brief descriptions of the eighteen significant F-Tests that were not considered in the main text.

Significant Effects Due to the Sex of the Experimenter. Male experimenters resulted in more, off-centered placement and a greater number of transparancies for the person figure drawings.

Significant Effects due to the Individual Experimenter. Significant differences occured between individual experimenters in the GSR frequency rates of the participants that they tested during the opposite sex person figure drawing task.

Significant Participant Sex Differences. Female and Male participants differed on a number of dependent variables. Female participants spent less time than males in drawing the opposite sex person and the car. They also used more shading on the opposite sex person figure, and had fewer delineation line absenses and a larger vertical:horizontal ratio for the car drawing. Finally, female participants had a larger head:body ratio for the person figure, and less vertical imbalance for the car figure.

Significant Interactions Which Included Presence/Absence. A significant presence/absence by sex of participant (AxP) interaction occured for head simplification on the person drawing. Head simplification was greater for female participants when an experimenter was present, but about the same for female participants when the experimenter was absent and for the male participants regardless of whether the experimenter was present or absent.

Significant individual experimenter by present/absent (IxA) interactions occured for GSR frequency rate on the person drawing. One experimenter
resulted in a higher rate when he was absent, while four experimenters resulted in a higher rate when they were present. Frequency rate did not essentially vary across present and absent conditions for the remaining experimenter.

Significant individual experimenter by present/absent by sex of participant (IxAxP) interactions occured for the head size of the person figure for head:body ratio on the opposite sex person figure, and for shading and transparancies on the car figure. Since these interactions include the effects of unique experimenters (a non-replicable factor) and since they are very complex, they will not be described here.

Other Significant Interactions (not including A as a factor)

Significant individual experimenter by sex of participant interactions (IxP) occured for line discontinuity and omission on the car figure. These interactions are also very complex and of little interest since they only occured for the car figure; they will not be described either.