

LAKEHEAD UNIVERSITY

PERSONAL SPACE: THE RELATIONSHIP TO MODE OF FIELD APPROACH

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ABSTRACT

The literature pertaining to personal space and field-dependency is ambiguous with reference to the nature of the relationship between these two variables. The present study proposed to explore the possible relationship of personal space to field-dependency by comparing the performance of relatively field dependent and relatively field independent individuals on three personal space tasks. It was expected that the two groups would differ significantly on each task, and that subjects would demonstrate consistent personal space characteristics.

Forty-eight female undergraduate volunteers were initially administered the Embedded Figures Test in order to determine the degree of field-dependency. The dependent variables, which were designed to measure personal space characteristics, included scores from the Spatial Invasion Procedure, the Figure Placement Task, and the Silhouettes Task. Twenty-six of the subjects were paid, 22 were non paid subjects.

The results indicated: (a) a lack of significant differences between the field dependent and field independent groups on the measures of individual distance (i.e., scores from the Spatial Invasion Procedure and the Silhouettes Task) while significant differences were obtained between the two groups on the Figure Placement Task ($p < .02$); (b) a lack of consistency within both groups concerning the measures of personal space characteristics; (c) a high positive correlation between the measures of individual distance ($p < .02$) for paid subjects, while this relationship was non-significant for non paid subjects, the measures of individual distance evidenced no relationship to scores on the Figure Placement Task for both paid and non paid subjects; (d) a lack of relationship between the measures of individual distance and field-dependency

for both paid and non paid subjects, however, scores on the Figure Placement Task bore a high positive relationship to measures of field-dependency ($p < .01$) for paid subjects, while this relationship was not significant for non paid subjects; and (e) significant differences were found between paid and non paid subjects regarding scores on the measures of individual distance, indicating that paid subjects tended to maintain smaller individual distances, ($p < .01$, $p < .05$).

The results failed to support the hypotheses. It was concluded that there was a lack of relationship between personal space, as reflected by individual distance, and field-dependency, and there appeared to be a lack of consistency among the measures of personal space characteristics.

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Personal space (PS) refers to the immediate physical area around an individual's body that is intended to remain inviolate. It is marked by invisible and irregular boundaries which expand and contract in response to various conditions. These self-boundaries are omnipresent, dissolving only under conditions of crowding. PS is defined by Sommer (1969) as "the emotionally egotistic zone surrounding a person (p. 30)." Hall (1961) refers to "bubbles" or a configuration of spatial spheres in describing the form of PS. The boundaries of PS enclose what has been likened to a "portable territory." Lyman and Scott (1967) identify four kinds of territories that exist within human society: public (i.e., parks), home (coffeehouses which cater to a regular patronage, etc.), interactional (where social gatherings may occur), and body territories. In reference to the latter, Sommer (1969) states that:

"The territories encompassing the body, which we have called personal space, are the most private and inviolate spaces belonging to the individual (p. 44)."

Individual distance (ID) refers to the actual physical distance between two people either engaged in interaction or enclosed within the same physical space. Hall (1964) has isolated ID zones which he labels as intimate (0-18 inches), casual-personal (18-48 inches), socio-consultive (48-144 inches), and public domain (144 inches). Four factors are considered to determine the boundaries of these zones: culture, status, personality, and feelings towards each other. Degree of acquaintance appears to be a major determinant of these boundaries. The inverse relationship between distance and acquaintance was

first isolated by Little (1965). Guardo (1969) found that this relationship is present down to the 12 year old level, in both boys and girls.

Since the size of ID determines the degree of physical proximity between people, ID is considered to reflect PS. Experimental investigations of PS characteristically used frontal measures of ID, either projective (i.e., paper and pencil tasks) or actual approach situations, to study the nature of PS. A further explanation for the methodology is given by Sommer (1969):

Individual distance and personal space interact to affect the distribution of persons. The violation of individual distance is the violation of society's expectations: the invasion of personal space is an intrusion into a person's self_boundaries (p.27).

Consequently,

...the most feasible method for exploring individual distance and personal space with their invisible boundaries is to approach people and observe their reaction (p. 29).

McBride, King and James (1965) investigated the effects of social proximity upon adult subjects. These authors compared the effects of different approach directions, i.e., frontal, lateral, or rear. Reactions to excessive closeness were measured by the galvanic skin response (GSR) which was used as an index of emotionality, or response to stress. It was found that emotionality was greatest when subjects were approached frontally and least when they were approached from the rear. A significant interaction was noted between social proximity and sex, i.e., the GSR was greatest when individuals were approached frontally by members of the opposite sex.

A recent study has shown that the age of the invader is an

important variable in eliciting reactions to excessive closeness. Male and female confederates in middle childhood were instructed to approach very near to adults, while the approach proceedings were unobtrusively observed. Observations yielded the following results. Five year olds elicited a positive reaction, while eight year olds were ignored. Only the ten year olds evoked the expected negative reactions to excessive closeness (Frye & Willis, 1971).

Research has indicated that experimental measures of ID involving an actual approach situation have high test-retest reliability (Hiat, 1971). Hiat also found that while the size of ID varies according to the target or subject approached, there is significant individual consistency in the size of ID relative to other subjects. Therefore, it was possible to describe the subjects as exhibiting reliably small, average, or large IDs.

The literature on PS reveals that a number of variables appear to influence the size of ID. There is both anecdotal and experimental evidence regarding the relationship of the size of ID to culture, status, age, sex, and acquaintance (e.g., Hall, 1966; Wolfgang, 1968; Sommer, 1969). Recently the interaction between interpersonal attitudes and the size of ID has been explored. The results have indicated that subjects' attitudes toward target persons of varying social and physical identities appear to be reflected in the corresponding measures of ID. For example, subjects placed themselves further from social deviates than from normal peers (Wolfgang & Wolfgang, 1971). A small, but significant, number of studies have investigated the relationship of

personality variables to PS as reflected by measures of ID. The data suggests that those individuals who possess similar personality traits also demonstrate similar PS characteristics.

One of the first systematic studies of the relationship of personality to ID was conducted by Williams (1963), who investigated the correspondence of introversion-extraversion to PS. Spatial invasion was employed to elicit subjects' reactions to excessive closeness. Spatial invasion consisted of walking toward an individual who had been previously instructed to indicate verbally when the experimenter came too close. This was followed by the reverse procedure, whereby the experimenter slowly retreated from a point very near the individual until it was indicated that he had reached a point too distant for comfortable conversation. Subjects were previously classified as introverts or extraverts on the basis of their scores on a personality test. The results indicated that introverts maintained greater conversational distances than extraverts.

Kinsel (1969) observed the relationship between the body buffer zone, which is supposed to reflect PS, and aggression. He found that violent prisoners displayed a more extensive body buffer zone, in that they reacted more defensively to approach, and much sooner than non-violent prisoners. Daves and Swaffer (1971) noted a significant positive relationship between PS and dogmatism. Frankel and Barrett (1971) examined variations in PS as a function of self-esteem and authoritarianism. These authors hypothesized that individuals with low self-esteem would manifest more expressive behaviours and possess

a larger PS. Individuals rating high on authoritarianism were also expected to exhibit a larger PS. Those individuals displaying both characteristics were expected to possess the largest PS, and show the largest discrepancy when approached by adults of differing racial origins. The data confirmed these hypotheses.

Although research attests to the relationship of PS to personality variables such as aggression, dogmatism, anxiety (Schlacter, 1971), introversion/extraversion, and authoritarianism; relatively few individual characteristics associated with PS are known. Further investigation is needed as noted by Hall (1966), Sommer (1969), and Hiat (1971). The present study proposes to explore the relationship of PS phenomena to another major mode of personality organization--the field dependent/field independent personality.

The research of Witkin (1949a, 1949c) regarding the nature of individual differences in perception and later studies conducted in his laboratory concerning styles of cognitive functioning (Witkin, Lewis, Hertzman, Machover, Meissner, & Wapner, 1954), have elucidated an unique and enduring mode of personality organization based on the field dependence-independence dimension of perception. Early studies produced a battery of tests to determine perceptual style; these included the Rod and Frame Test, the Body Adjustment Test, and the Embedded Figures Test (EFT). The Rod and Frame Test and Body Adjustment Test explore the perception of the upright and the capacity to hold the body apart from the visual field when the latter is displaced. All three are indicative of the ability to overcome the influence of the

surrounding field, or to separate an item from its context. The literature reveals consistent correlations among tasks (see Linton, 1952; Witkin et al., 1954; Gruen, 1955). Relatively field independent (FI) persons are able to more accurately estimate the position of the true verticle during the Rod and Frame Test and perform similarly upon administration of the Body Adjustment Test. These persons demonstrate the ability to overcome the influence of the surrounding field and this is again reflected in their performance on the EFT, where the subject is required to identify a simple figure within a complex design. Such persons appear to manifest a general tendency to discriminate and articulate experience, and to analyze and structure their perceptions. These tendencies are exemplified by the observation that they can more effectively separate body from field. Further, these persons are observed to display a relatively well-defined body-image, and a more developed sense of separate identity. Conversely, relatively field dependent (FD) persons cannot readily perceive their body as separate from the field and tend to demonstrate an apparent fusion of both in experience, resulting in a global style of experiencing. The latter characteristics are associated with a less well articulated body concept, and lesser development in regard to a separate sense of identity (Witkin, Dyk, Faterson, Goodenough, & Karp, 1962).

Various tendencies associated with personal-social functioning have been related to perceptual field dependence. For example, Linton (1955) demonstrated that those individuals whose performance appeared

to be strongly affected by the perceptual field across a number of perceptual tasks are more likely to display increased behavioural responsiveness to cues presented in various conformity situations, in accord with the central tendency to be more receptive to external influence. In addition, FD individuals tend to be more gregarious, socially outgoing and dependent on the good opinion of others (Pemberton, 1952). FI individuals, on the other hand, tend to display more self-control, ambition, perseverance, and a more logical theoretical approach, as indicated by their responses to various items on personality inventories (Pemberton, 1952). A study by Stark, Parker, and Iverson (1959) showed that while FD individuals were apparently influenced by the examiner's attitude toward them during the experimental condition, FI individuals (i.e., those employing an analytical approach) appeared to be relatively immune. Bell (1955) investigated the relationship of the field-dependence-independence dimension to Reisman's (1950) concept of inner/other-directed attitudes and found a significant correlation between field-dependence and an other-directed orientation. The latter results are consistent with the findings of Crutchfield (1958) who revealed marked differences along the warm/cold dimension of interpersonal functioning with regard to mode of field approach. At the extremes, FD individuals tend to be warm, considerate and affectionate, while extremely FI individuals appear to be cold, austere, and unaware of their social stimulus value. Research regarding the relationship of personal-social functioning to mode of field approach suggests, then, that FD individuals tend to

possess more extraverted traits while FI individuals manifest more introverted characteristics.

Consistent sex differences are apparent regarding mode of field approach. These findings are supported by various cross-cultural studies which indicate that males tend to be more FI than females. These differences were obtained in populations examined during middle childhood (eight years), adolescence, adulthood and geriatric groups (Witkin et al., 1962).

A second general finding in the literature relates to stability in the mode of experiencing over time. Longitudinal studies reveal consistency in the mode of field approach over a twelve year period; relative stability is observed between the ages of ten and twenty-four. Other studies report increased stability within adult groups (Witkin, 1965, 1967). Research indicates that variations in the degree of field-dependency are related to age. Field-independence increases progressively between the ages of eight and fifteen years after which changes level off and approach a plateau. There appears to be a return to field-dependence in old age (Witkin, Goodenough, & Karp, 1967; Schwartz & Karp, 1967).

One recent study which bears an indirect relationship to field-dependency and PS was conducted by Dosey and Meisels (1969), who investigated the effect of personal threat upon the body buffer zone among subjects with differing barrier scores. Barrier scores represent an index of body boundary definiteness, and are composed of an individual's responses to an inkblot series such as the Rorschach or

Holzman. Boundary definiteness is based on the number of responses which emphasize protective, containing, decorative, or covering functions of the periphery. High inter-rater reliability and adequate re-test reliability on the barrier index has been demonstrated by Daston and McConnel (1962). Studies have shown that the barrier index is related to certain behavioural and physiological variables, i.e., the higher the barrier index, the greater the probability that he tends to be active, independent, and autonomous. Furthermore, these individuals seem to attend primarily to exterior rather than interior sensations (Fisher & Cleveland 1965). Barrier scores are also considered to represent the extent to which the body is perceived as separate from the environment, and the latter concept embodies the most basic and definitive explanation of the field-dependence-independence dimension of personality. It follows, therefore, that individuals producing high barrier scores tend to be more FI. This assumption was supported by Fisher and Cleveland (1958) who found that women with high barrier scores were significantly more FI, as indicated by the Rod and Frame Test and the EFT. Witkin, et al. (1962) noted that the relationship between barrier scores and mode of perceiving, demonstrated with female subjects, was not obtained in males.

Based upon the observations of Fisher and Cleveland (1958, 1965) Dosey and Meisels (1969) hypothesized that those subjects with low barrier scores, possessing weak body boundaries, would utilize or create certain exterior conditions in order to provide artificial sub-boundaries. This behaviour should be particularly apparent during

conditions of threat to their self-esteem, thus producing an increase in personal space. The body buffer zone has been observed to increase during stressful or anxiety arousing situations (Leipold, 1963). However, an analysis of Dosey and Meisels' data did not adequately support the hypotheses regarding differential increase in personal space across groups during stressful conditions.

The present study investigated the direction of the relationship between field-dependency and PS preferences. This relationship is of particular interest because the literature generates considerable ambiguity regarding possible inferences as to the nature of the relationship between these two variables. Therefore, no specific hypotheses were made with reference to the direction of the relationship between PS and field-dependence. The theoretical and evidential contradictions are summarized below.

Several studies cited previously in the paper, indicated that those individuals manifesting relative field-dependence tend to demonstrate more extraverted behaviours (Reisman, 1950; Pemberton, 1952; Crutchfield, 1958). Williams (1963) has shown that extraverted individuals tend to maintain smaller interpersonal distances than introverts. Conversely, Fisher and Cleveland (1958) propose that individuals with a weak body image, high barrier scores, and consequent tendencies toward field-dependence, would also use exterior conditions to create artificial sub-boundaries about the body. This would result in an increase in PS, although Dosey and Meisels (1969) were unable to demonstrate this during conditions of threat. Further, FD individuals

tend to experience their bodies as a rather vague mass, relatively unarticulated, and not perceived as clearly separate from the environment (Witkin et al., 1962). These characteristics would suggest a more extensive PS, in comparison with more FI individuals who possess a more sophisticated body concept in that it is more articulated, and more readily perceived as separate from the environment. As noted previously, another characteristic associated with FDs--low self-esteem--also seems to be related to a larger PS (Frankel & Barrett, 1971).

It was hypothesized that individuals manifesting relative field dependence and relative field independence would differ according to PS preferences. It was also hypothesized that FD individuals would demonstrate consistent PS preferences on all three dependent variables: the performance of the FI individuals was also expected to demonstrate consistency across all measures of PS characteristics. It was expected that there would be positive correlations among the three dependent variables since they were all designed to measure PS characteristics. The three dependent variables were scores from the Spatial Invasion Procedure (SIP), the Figure Placement Task (FPT), and the Silhouettes Task (ST).

METHOD

Subjects

Subjects were 48 females, 18 to 25 years of age, enrolled in the Introductory Psychology course at Lakehead University. All subjects were chosen on a volunteer basis and received one credit toward final grades in the course for experimental participation. However, due to the limited population of subjects available, and general difficulty in obtaining subjects as data collection continued, 26 of the 48 subjects were offered monetary incentive for participation as well as experimental credits. The paid and non paid subjects were checked for differences on all of the experimental procedures by means of t tests. Sex (female), culture (Canadian born), and degree of acquaintance (all subjects were unknown to the experimenter) were specified in order to effect some degree of control over those variables previously shown to influence PS (Sommer, 1959; Hall, 1964; Little, 1965).

Materials

Embedded Figures Test (EFT): the EFT was developed by Witkin (1950) and originally consisted of two sets of 24 cards, representing simple and complex figures, respectively. A 5 minute search time was allowed, originally on each of the 24 trials for identification of the simple figure within the complex design. Jackson (1956) developed a short form of the EFT, requiring only the first two sets of 12 cards and permitting only a 3 minute search time. The short

form correlated highly with the original version ($r = .95$). The 1971 revised edition of the short form of the EFT was employed in the present study (Witkin, Oltman, Raskin, & Karp, 1971).

High test-re-test reliability has been demonstrated with the EFT across varying age groups; Gardener, Jackson, and Messick (1960) reported a reliability of .95 for college women. Split-half reliabilities approximate .90 (Linton, 1952). A variety of studies validated the idea that the EFT was a test of perceptual field-dependence, and demonstrated significant correlations with scores on other perceptual tasks, for example, Linton (1955). Correlations among scores on the Rod and Frame Test, the Body Adjustment Test, and the EFT for college populations vary between .54 and .64, all significant beyond the .01 level (Linton, 1952; Gruen, 1955). On the basis of these findings it would appear that the ability to overcome an embedding context is central to the concept of field-dependence. It should be noted that the above findings are based on the original version of the EFT, but are considered applicable to the short form used in the present study.

An individual presentation consists of brief timed exposures of the complex figure and the simple figure, in that order, followed by a re-exposure of the complex design, during which the subject is instructed to locate the embedded figure as quickly as possible.

The subject's total score represented the sum of his solution times in seconds over 12 trials. A high score indicated difficulty in overcoming the influence of the surrounding field. A more detailed

description of test material and instructions is contained in Appendix

B.

Spatial Invasion Procedure (SIP): The SIP was conducted in an experimental room which was empty except for a narrow table and two chairs which paralleled the width of the room. The dimensions of the room were 15 feet X 14 feet X 10.5 feet. The room was considered appropriate for the SIP since neither the length nor the width was exaggerated. It has been found that the extent of a single dimension exerted an influence on measures of ID (Daves & Swaffer, 1971).

In order to facilitate the measurement of ID, two intersecting strips of masking tape, marked off in $1 \frac{1}{3}$ inch units, were placed directly along the length and width of the experimental room. The subject was requested to stand at the point of intersection of the tape in order that she might be approached in a uniform manner from all three directions, i.e., frontal, lateral, or rear.

Prior to initiating the SIP, all subjects were instructed to indicate verbally when the experimenter reached an approach position that was perceived as uncomfortable for conversation, that is, when she felt like moving away. This is known as the critical interpersonal distance. The subjects were instructed to similarly indicate when the experimenter had retreated to a comfortable conversational distance. The verbal instructions given to each subject regarding this procedure, were as follows:

- a) Preceding approach: Tell me when I reach the position at which you feel uncomfortable, that is, when you feel that I am too close for comfortable conversation and you want to back away.
- b) Preceding retreat: Tell me when I reach the position at which you feel comfortable, that is, when you feel I am at a comfortable position for conversation.

The SIP employed here is similar to the method described by Williams (1963). The experimenter began the approach in each direction from a point 8 feet from the subject. The approach continued until the subject indicated that she felt uncomfortable at which time the critical interpersonal distance was recorded. The experimenter then retreated from that point until the subject indicated that a comfortable conversational distance had been reached. This distance was then recorded. Since the degree of physical proximity in social interaction is also a function of eye-contact (Argyle and Dean 1965), the experimenter continued to look directly at the subject during approach and retreat.

The toe-to-toe distances between the subject and the experimenter were recorded in inches, accurate to 1/2 inch.

Figure Placement Task (FPT): The FPT was described by Martin and Schroeder (1968). The FPT is based on earlier work by Kuethe (1962a, 1962b) concerning the representation of social schemes. Test material for the present study consisted of photographs of three background scenes depicting a living room, street, and field, in addition to a blank area. All backgrounds were 7 - 8 1/2 X 8 - 11 inches in size, and affixed to bristol board backing, 8 X 11 inches in size. A set of four cardboard cut-outs, two male and two female adult figures accompanied the background. Each of the three sets of figures were identical and scaled to suit the internal dimensions of each background.

Instructions for subjects during individual presentations were as follows: "Place these figures on the background to make a picture that

tells a story."

Each of the four backgrounds were encased in transparent plastic folders during presentation. Following placement of the figures, the arrangement was recorded by tracing the outline of the figures on the plastic surface in removable ink. The distances between the figures were taken at eye level, based on the theory that the degree of intimacy indicated in interaction is a joint function of eye-contact and physical proximity (Argyle & Dean, 1965). The mean distance between the figures for each subject was calculated in inches, accurate to 1/8 inch (see Appendix C).

Interfigure distance scores on the FPT were computed by first obtaining the three distances between the four figures placed on each background. The mean interfigure distance for each background was then obtained, and the four mean distances were averaged to obtain the FPT score for each subject.

The thesis of the FPT is basically that the horizontal distances between the figures arranged on the background are indicative of an individual's actual approach/avoidance tendencies toward social interaction. Martin and Van Dyke (1968) provided experimental evidence for Kuethe's assumption that past experience and learning are involved in performance on the FPT, and lent support to the interpretation that horizontal distances reflect approach/avoidance tendencies. However, a study by Holahan and Levinger (1971) challenged Kuethe's assumption. The findings of these authors suggest that horizontal distances on the FPT reflect actual physical distances rather than psychological distances in

interaction. Specifically, subjects were exposed to an experimenter whose behaviour varied according to psychological distance (warm/cold) and physical distance (near/far). Following the experimental condition, subjects were administered the FPT and instructed to place themselves in relation to the experimenter. Physical distance (ID) exerted the primary influence on figure placement. The latter study involved the use of self-referent figures on the FPT, whereas the present study did not. The procedure involved and the implications of the study would seem more appropriately applied to the ST (described below) which employs a self-referent figure and measures horizontal distances.

Silhouettes Task (ST): The ST has been used to investigate the inverse relationship between ID and acquaintance, described by Little (1965). Guardo (1969) has administered the ST to children and adolescents in order to ascertain the possible presence of a similar relationship during childhood. The influence of interpersonal attraction upon ID was also examined. High test-re-test reliability has been established for the ST ($r = .84$, significant at less than the .01 level) (Guardo, 1969). In the present study the ST was used to estimate ID and to investigate the relationship of ID to liking and acquaintance when the mode of field approach was varied.

The ST materials consisted of a seven page booklet, 11 X 7 inches in size, depicting one of seven different 8 1/2 inch silhouettes on each page, in addition to a cardboard cut-out of a female figure of the same size. The silhouettes within the booklet appeared in a counterbalanced order. ST materials were constructed by the author

according to the basic description given by Guardo (1969). This task is similar to the Interpersonal Distance Test, described by Wolfgang and Wolfgang (1971) and the Drawing Test, implemented by Hiatt (1971).

The instructions for the ST were as follows:

Imagine that this is a friend; where would you be standing?
Trace the figure in that position.
This is a _____ (acquaintance /stranger) whom you
(like/dislike/neither like nor dislike). Where would you
be standing? Trace the figure in that position.

The horizontal distances between the figures appear to be indicative of those PS or ID zones identified by Hall (1964): intimate (0-18 inches), casual-personal (18-48 inches), socio-consultive (48-144 inches). A scale of 1 inch to 8 1/2 inches was employed in order to incorporate these zones. The horizontal distances between the stimulus and the self-referent figure were taken at eye level (Argyll & Dean, 1965). The mean ID in inches, accurate to 1/8 inch was calculated for each subject.

The ST is considered particularly appropriate as a PS task because of the use of the self-referent figure (see Appendix D).

Procedure

All subjects were met by the experimenter in the subject's waiting area and were shown to the experimental room. The experimenter proceeded to introduce herself and the study as follows:

My name is _____. I'm a student and I'm doing some research with Dr. _____. The purpose of this study is to observe different patterns of social interaction among female undergraduates. During the course of this study you will be asked to participate in three "paper and pencil" type of tasks and one task of a different nature. This should take about 45 minutes. At the end of that period

I'll be glad to answer any questions you might have about the nature or purpose of this study. Are there any problems?

The general instructions given to all subjects were intended to be oblique. The author felt that a more natural response regarding the subject's spatial behaviour would be elicited if she were not in a set to focus specifically on the behaviour. During the experimental procedure, the experimenter attempted to conduct herself in a relaxed, neutral manner, since differential behaviour might have induced confounding influences on performance of the PS tasks, particularly spatial invasion.

All subjects initially completed the EFT. Subjects' PS preferences were investigated as follows. In order to control for possible effects due to the order of presentation of these procedures, which included the SIP, the FPT, and the ST, the tasks were administered in a counterbalanced order.

It is noted that the EFT scores for each subject were not calculated until data collection was completed, in order to control for possible experimenter effects (Rosenthal, 1966).

Following completion of the experimental procedures the experimenter thanked the subject for participating and assigned the appropriate reward. The experimenter then enquired of the subject whether she had any questions regarding the study and explanation and discussion followed. The latter period often exceeded 25 minutes. All subjects demonstrated an interest in both the experimental procedures and PS phenomena. The experimental time averaged 45 minutes per subject.

RESULTS

Scores were obtained for all subjects on each of the four measures. These included the Embedded Figures Test (EFT), the Spatial Invasion Procedure (SIP), the Figure Placement Task (FPT), and the Silhouettes Task (ST). Scores on the EFT were used as an index of field-dependency. High scores identified relatively field dependent (FD) individuals, and low scores, relatively field independent (FI) individuals. Scores on the dependent variables were: the toe-to-toe distances between the subject and the experimenter for the SIP; interfigure distances on the FPT; and distances between the printed stimulus figures and the self-referent figure on the ST. All three dependent variables were designed to measure personal space (PS) characteristics. The SIP involved an actual approach situation, while the FPT and the ST were projective tasks, constructed to reflect PS characteristics by graphic stimulation of interpersonal situations. Scores from the SIP were used to derive interpersonal distances (ID). Frontal, lateral, and rear IDs were used to determine the boundaries of the subject's PS and to generate PS areas. Scores on the FPT were thought to indicate subjects' actual approach/avoidance tendencies toward social interaction. Scores on the ST were used to derive IDs, and to possibly reflect the relationship of ID to liking and acquaintance (Little, 1965). Scores on each of the dependent variables corresponding to scores within the upper and lower quartiles of the EFT were examined for differences by means of t tests for independent

samples (Ferguson, 1966). The two groups--FD and FI--represented by the upper and lower quartiles of EFT scores, were expected to differ with regard to PS characteristics across the three dependent variables. However, no expectations regarding the direction of the differences were stated. It was expected that all subjects would demonstrate consistent PS characteristics across all tasks. Intercorrelations were expected on performance data for all subjects on each of the PS tasks.

Paid and non paid subjects were examined for differences regarding performance on all tasks by means of t tests. No significant differences were expected.

Embedded Figures Test (EFT)

EFT scores were used as an index of field-dependency. Scores represented the mean solution time over 12 items. Scores in the upper quartile indicated relative field dependence, lower quartile scores indicated relative field independence. Scores in the upper and lower quartiles ranged from 63.75 to 125.25 and from 20.50 to 35.66, respectively. EFT norms obtained in the present study for the total population are compared with norms established by Witkin (1954) in Table 1.

TABLE 1

Norms for the Embedded Figures Test in Seconds

	Age Level	Sex	N	M	SD
Present Study	Lakehead University Sample 18-25 years	F	48	54.26	25.11
Witkin (1954)	College sample	F	51	66.90	33.60

An analysis of the data indicated that the mean score on the EFT for subjects in the present study was significantly different from the mean score obtained in Witkin's (1954) study ($t = -2.13$, $df = 97$ $p < .05$).

Spatial Invasion Procedure (SIP)

ID was represented by the toe-to-toe distances between the subject and the experimenter. The average frontal, lateral, and rear IDs, in inches, were obtained for each subject. Average ID was the mean of the critical ID and comfortable conversational distance. Average frontal, lateral, and rear IDs were used to generate PS areas (i.e., lateral X frontal + lateral X rear). The formula employed $\left[\left(\frac{1}{2} bh \right) + \left(\frac{1}{2} bh \right) \right]$ produced the area of a rhombus or roughly kite-shaped area which was used to approximate PS. The means and standard deviations for (a) PS areas, (b) critical IDs, frontal, (c) average frontal IDs, and (d) comfortable conversational distances, frontal, appear in Table 2.

The data regarding personal space areas, obtained on the SIP, were transformed to square roots for all analyses in an attempt to normalize these results.

The means of the PS measurements for the FD group were not consistently smaller than the means for the FI group. The analyses revealed that the differences between each of the means of PS areas, critical IDs, average IDs and comfortable conversational distances for the FD and FI groups were not significant.

TABLE 2

Means and Standard Deviations of the Personal Space Measurements
for Field Dependent and Field Independent Subjects on the Spatial
Invasion Procedure in Inches

Personal Space Measure	Group	N	M	SD	t
Personal Space Areas	FD	12	13.56	7.95	0.94
	FI	12	11.03	4.08	
Critical Interpersonal Distance	FD	12	7.42	6.98	0.08
	FI	12	7.25	2.08	
Average Interpersonal Distance	FD	12	11.25	7.28	- 0.43
	FI	12	12.51	6.37	
Comfortable Conversational Distance	FD	12	15.12	7.99	- 0.61
	FI	12	17.25	8.35	

*p > .20

Figure Placement Task (FPT)

The mean interfigure distance, in inches, on the FPT was obtained for each subject. The means and standard deviations, based on the interfigure distance data, for FD and FI subjects appear in Table 3.

TABLE 3

Means and Standard Deviations of Interfigure Distance for Field Dependent and Field Independent Individuals on the Figure Placement Tasks in Inches

Group	N	M	SD
FD	12	2.37	0.83
FI	12	1.61	0.48

Results indicated that the mean interfigure distance for FD individuals was significantly different than the mean for FI individuals ($t = 2.65$, $df = 22$, $p < .02$). An inspection of Table 3 reveals that the mean of interfigure distance for the FD group is larger than the mean for the FI group.

Silhouettes Task (ST)

The mean distance, in inches, between the seven silhouettes and the self-referent figure was computed for each subject. These data were also thought to reflect PS characteristics. Mean IDs on the ST for FD and FI subjects were analyzed for differences regarding the relationship of liking

and acquaintance to ID. t tests indicated that the means of ID for FD and FI subjects did not differ significantly from each other as a function of the characteristics assigned the stimulus figures, i.e., like/dislike or acquaintance/stranger. The results revealed no significant differences within groups, i.e., between the means of ID for the like/dislike, nor for the acquaintance/stranger conditions. In view of the lack of significant differences between these conditions, the data for the like/dislike and acquaintance/stranger conditions were combined. (The values for t , df , and p regarding each condition appear in Appendix E).

The means and standard deviations for the combined data regarding ID for FD and FI subjects are represented in Table 4.

TABLE 4

Means and Standard Deviations of Individual Distance for Field Dependent and Field Independent Subjects on the Silhouettes

Group	Task in Inches		
	N	M	SD
FD	12	3.51	1.30
FI	12	3.67	1.26

Analysis revealed that the mean ID for FI subjects was not significantly different than the mean for FD subjects ($t = 0.294$ $df = 22$ $p > .20$).

Intercorrelations between the EFT, SIP, FPT, and ST scores are represented in Table 5. This analysis incorporated the data obtained for all 48 subjects. EFT scores were significantly related to the measures of interfigure distance on the FPT ($p < .005$). A significant relationship between individual distance, as determined by the ST, and PS areas, as elicited by the SIP, was found ($p < .005$). No other relationships between the dependent variables were significant. EFT scores did not bear significant relationship to the ST and SIP scores.

It is noted that the data for paid and non paid subjects were analysed separately with regard to the degree of relationship between scores on the four tasks. These analyses appear in Tables 10 and 11.

TABLE 5

Summary of the Intercorrelations Between the EFT, SIP, FPT
and ST Scores

	EFT	FPT	ST	SIP
EFT		.489**	.015	-.027
FPT			.064	-.089
ST				.507**

**p < .005

Paid and Non Paid Subjects

TABLE 6

Means, Standard Deviations and t values for All Paid and Non Paid Subjects for Scores on the EFT, SIP, FPT and ST

Group	Task	N	M	SD	t	p
Paid	EFT	26	55.20	28.02		
Non Paid	EFT	22	50.72	22.72	0.60	NS
Paid	SIP	26	11.52	7.32		
Non Paid	SIP	22	20.56	11.44	-3.31	.01
Paid	FPT	26	2.02	0.72		
Non Paid	FPT	22	1.73	0.44	1.62	.NS
Paid	ST	26	3.52	1.07		
Non Paid	ST	22	4.44	1.59	-2.39	.05

An inspection of Table 6 reveals that paid subjects differed significantly from non paid subjects regarding performance on the ST and the SIP; paid subjects evidenced smaller personal space (PS) areas as reflected by the SIP scores and smaller individual distances as indicated by the ST scores. Due to the significant differences between the groups the data for the paid and non paid subjects were analysed separately on each of the PS tasks. These analyses appear in Table 7 below.

Prior to obtaining the comparisons for the paid and non paid groups as represented in Table 7, the data for paid and non paid subjects were rank ordered according to scores on the EFT, the upper half of the EFT scores in each group represented FD subjects, and the lower, FI subjects. The data for FD and FI subjects were then checked for differences on each of the personal space tasks by means of t tests for independent groups.

Observation of Table 7 indicates that when the data for paid and non paid subjects were analyzed separately the results reflect those obtained when these groups are combined. Specifically, the measures of individual distance, the SIP and the ST, failed to differentiate FD and FI individuals within the paid and non paid groups; similar results are obtained when paid and non paid subjects are combined and the FD and FI subjects compared, see Table 2.

It is noted that the differences between FD and FI individuals regarding scores on the FPT, within the paid group, approached significance ($p < .10$), while the non paid group evidenced significant differences between FD and FI individuals ($p < .05$). The analysis of the combined data also revealed significant differences between FD and FI individuals in the same direction as those for the paid and non paid groups. FD individuals exhibited larger interfigure distances on the FPT throughout all analyses of the data relating to scores on this task. Since the direction of the means was consistent in all groups, the slight discrepancy in the levels of significance was attributed to the effect of using smaller samples in the separate analyses, particularly since there were no significant differences between the performance of all paid and non paid subjects on this task.

As a further measure of caution the FD and FI individuals, identified within the combined group as those subjects who occupied the upper and lower quartiles of the EFT scores, were checked for differences on the payment versus non payment variable for scores on each of the personal space tasks by means of t tests for independent samples. These results appear in Tables 8 and 9.

TABLE 7

Means, Standard Deviations, and t values for Field Dependent and Field Independent Subjects within the Paid and Non Paid Groups regarding Scores on

			the SIP, FPT and the ST				
Group	Task		N	M	SD	t	p
Paid	FD	SIP	13	11.12	4.52	-0.27	NS
	FI	SIP	13	11.92	9.54		
Non Pd.	FD	SIP	11	21.82	12.71	0.51	NS
	FI	SIP	11	19.29	10.48		
Paid	FD	FPT	13	2.25	0.88	1.71	.10
	FI	FPT	13	1.79	0.42		
Non Pd.	FD	FPT	11	1.93	0.35	2.35	.05
	FI	FPT	11	1.53	0.44		
Paid	FD	ST	13	3.41	1.05	-0.48	NS
	FI	ST	13	3.62	1.12		
Non Pd.	FD	ST	11	4.94	1.57	1.54	NS
	FI	ST	11	3.93	1.35		

TABLE 8

Means, Standard Deviations and t values for Paid and Non Paid Subjects when Scores on the SIP, FPT and the ST are compared within the Field

		Dependent Group				
Group	Task	N	M	SD	t	p
Paid	SIP	8	9.94	4.25	-1.57	NS
Non Paid	SIP	4	17.58	12.91		
Paid	FPT	8	2.54	1.02	0.94	NS
Non Paid	FPT	4	2.04	0.34		
Paid	ST	8	3.33	1.33	-0.64	NS
Non Paid	ST	4	3.88	1.55		

TABLE 9

Means, Standard Deviations, and t values for Paid and Non Paid Subjects
when Scores on the SIP, FPT, and ST are compared within the Field
Independent Group

Group	Task	N	M	SD	t	p
Paid	SIP	6	11.03	5.24	-1.04	NS
Non Paid	SIP	6	16.08	10.44		
Paid	FPT	6	1.79	0.48	0.67	NS
Non Paid	FPT	6	1.61	0.47		
Paid	ST	6	3.31	1.36	-0.95	NS
Non Paid	ST	6	4.03	1.29		

Inspection of Tables 8 and 9 reveals that there were no significant differences between the paid and non paid subjects either within the upper quartile, (FD group) or within the lower quartile (FI group). It is noted that the means of the scores on the SIP, i.e., personal space areas, were consistently smaller for paid group as indicated by Tables, 6, 7, 8, and 9.

Since separate analyses of the data for paid and non paid subjects did not yield results which were contradictory to the analyses on the combined groups and in fact were very similar to those obtained when paid and non paid subjects were combined, the results regarding comparisons of the FD and FI individuals according to their scores on the four tasks are discussed in terms of the analyses for the combined group, in the following section. However, the overall differences between paid and non paid subjects is acknowledged, and due to the latter, separate analyses were performed on the data for all paid and non paid subjects in order

to examine the relationship between scores on the four experimental procedures, the EFT, SIP, FPT, and ST for these two groups. These analyses appear in Tables 10 and 11.

An inspection of Tables 10 and 11 reveals that the measure of field-dependency, the EFT scores, was significantly related to scores on the FPT for paid subjects, $p = < .01$ while this relationship does not appear to be significant for non paid subjects. Further, the measures of individual distance, the SIP and the ST evidence a significant relationship, $p = < .02$, for paid subjects, while the relationship between these measures did not reach statistical significance for non paid subjects. No other relationships between the tasks were significant. The analyses on the combined data for all subjects indicated that the EFT scores and the FPT scores were significantly related, as were scores on the two measures of individual distance, the SIP and the ST; both relationships were significant beyond the .005 level. No other significant relationships were obtained. Since the degree of the relationship between performance on the SIP and the ST differs for paid and non paid subjects, as does the degree of relationship between field dependency (EFT scores) and performance on the FPT for both groups, the results for the intercorrelations of these data are discussed separately in the following section.

TABLE 10

Summary of the Intercorrelations between the EFT, SIP,
FPT and ST scores for All Paid Subjects

	EFT	SIP	FPT	ST
EFT		-0.042	0.527**	-0.006
SIP			0.075	0.455*

*p = $\leq .02$

**p = $\leq .01$

TABLE 11

Summary of the Intercorrelations between the EFT, SIP,
FPT and ST Scores for All Non Paid Subjects

	EFT	SIP	FPT	ST
EFT		0.056	0.329	0.099
SIP			-0.067	0.342
FPT				0.056

DISCUSSION

The present findings did not indicate support for a relationship between individual distance (ID) and the mode of field approach. The initial hypothesis that field dependent (FD) and field independent (FI) individuals differ in their personal space characteristics, as reflected on each of the dependent measures, was not consistently substantiated. There were no significant differences between FD and FI individuals with regard to individual distance (ID) and PS areas, as measured by the Spatial Invasion Procedure (SIP). Significant differences were obtained between the FD and FI individuals regarding interfigure distance on the FPT. Analysis of the data for the Silhouettes Task (ST) did not reveal significant differences between FD and FI individuals regarding ID. Results did not confirm the hypothesis that both FD and FI individuals would demonstrate consistent PS characteristics across all measures of PS. It was expected that there would be significant intercorrelations among the three dependent variables or PS tasks; however the data provided only partial corroboration of this hypothesis. The correlational analysis was done separately for paid and non paid groups. The SIP and ST scores evidenced a high positive correlation for paid subjects ($p < .02$) while scores for the non paid subjects regarding the SIP and the ST showed a positive, although non-significant intercorrelation. Scores on the measures of ID, the SIP and the ST, for both paid and non paid groups, were not related to the measure of field-dependency, the EFT scores. Also, the measures of individual distance, for both groups, bore little relationship to the FPT scores. However, the FPT scores evidenced a high, positive relationship to the measure of field-dependency ($p < .01$) for paid subjects. Interfigure distance (FPT) scores and field-dependency (EFT) scores.

were positively related for the non paid subjects, however, this relationship failed to reach significance. Paid subjects as a group evidenced significantly smaller IDs than non paid subjects, as reflected by scores on the SIP and ST ($p < .01$, and $p < .05$, respectively). However, FD and FI subjects within groups, i.e., paid/non paid/combined were not differentiated on the ID variable.

The norms obtained on the EFT for the present study were significantly different from those derived by Witkin (1954). The majority of subjects in the present sample fell below the mean score, indicating that most subjects tended toward relative field-independence. It is possible that this skewed distribution resulted by chance. However, it would seem more plausible that this distribution is a consequence of the behavioural and attitudinal changes apparent among young women today. The contemporary behaviour and attitudes of college women would likely contrast sharply with those of almost twenty years ago, i.e., Witkin's (1954) sample. These changes fostered by such influences as the increasing emphasis on further education during the past decade, and an increasing awareness of the Women's Liberation Movement, have perhaps encouraged a more analytical or field independent approach in younger women, particularly. It is possible that the sex differences associated with the mode of field approach are less evident today. In fact, the present study reported the same mean EFT score as that obtained on a sample of 150 college males (Karp, 1963).

The results show that FD and FI subjects did not differ significantly according to ID as measured by the SIP. These results are comprehensible since analysis revealed not only that the SIP failed to differentiate subjects according to mode of field approach, but also that this measure of ID was not related to the measure of field-dependency.

These results tend to follow the findings of Dosey and Meisels (1969) who reported a lack of relationship between measures of ID, i.e., approach and silhouettes tasks, and body-image boundary as measured by the barrier index. As discussed previously, the barrier index reflects the central characteristics of the field-dependence dimension.

The failure to demonstrate a relationship between PS, as reflected by measures of ID, and field-dependency may proceed from the various personality characteristics of FD and FI individuals which indicate contradictory behaviour with regard to PS. The presence of conflicting tendencies regarding PS, which are discussed in an earlier section, may obscure any clear relationship between ID and field-dependency, and consequently, render it difficult to demonstrate apparent differences between FD and FI individuals. Also, any differences in the size of ID, which may have existed between the groups may have been minimized due to the observation that females approach closer to the same sex than males (e.g., Sommer 1959; Dosey & Meisels, 1969). However, the influence of this characteristic is not considered sufficient to account for the lack of significant differences between groups.

Interfigure distance, as represented by scores on the FPT apparently indicates an individual's conception of the size of the distances between others engaged in social interaction. The statistical analyses revealed that the interfigure distances displayed by FD individuals on the FPT were significantly greater than those displayed by the FI individuals.

If the FPT does, in fact, indicate an individual's actual approach/avoidance tendencies toward social interaction, then the opposite relationship should be obtained. Specifically, FD individuals appear to demonstrate relatively extraverted tendencies, and FI individuals, relatively introverted patterns of behaviour. Since extraverts express a greater preference for social interaction than introverts, the mean interfigure distance for the former should be smaller, i.e., interfigure distance should be smaller for FD individuals. The present results appear to contradict Kuethe's (1962a, 1962b) thesis regarding the FPT. Instead, the finding that FD individuals displayed greater interfigure distances than FI individuals may be attributed to the observation that the latter are generally less aware of, and attentive to others, particularly with regard to physical characteristics, than the former. Witkin et al (1962) support this observation and conclude the following:

There thus appears to be characteristic patterns of perceiving others associated with contrasting modes of field approach (p. 149). (The authors state further that FI individuals) show less interest in, and need for people....they are less attentive to the subtle, social cues given by others (p. 156).

Non verbal interaction (e.g., body language which generally refers to variations in eye-contact, gesture, and posture) in addition to ID, constitutes a most subtle form of social communication. FI individuals would be less aware of such cues as ID, while FD individuals, in

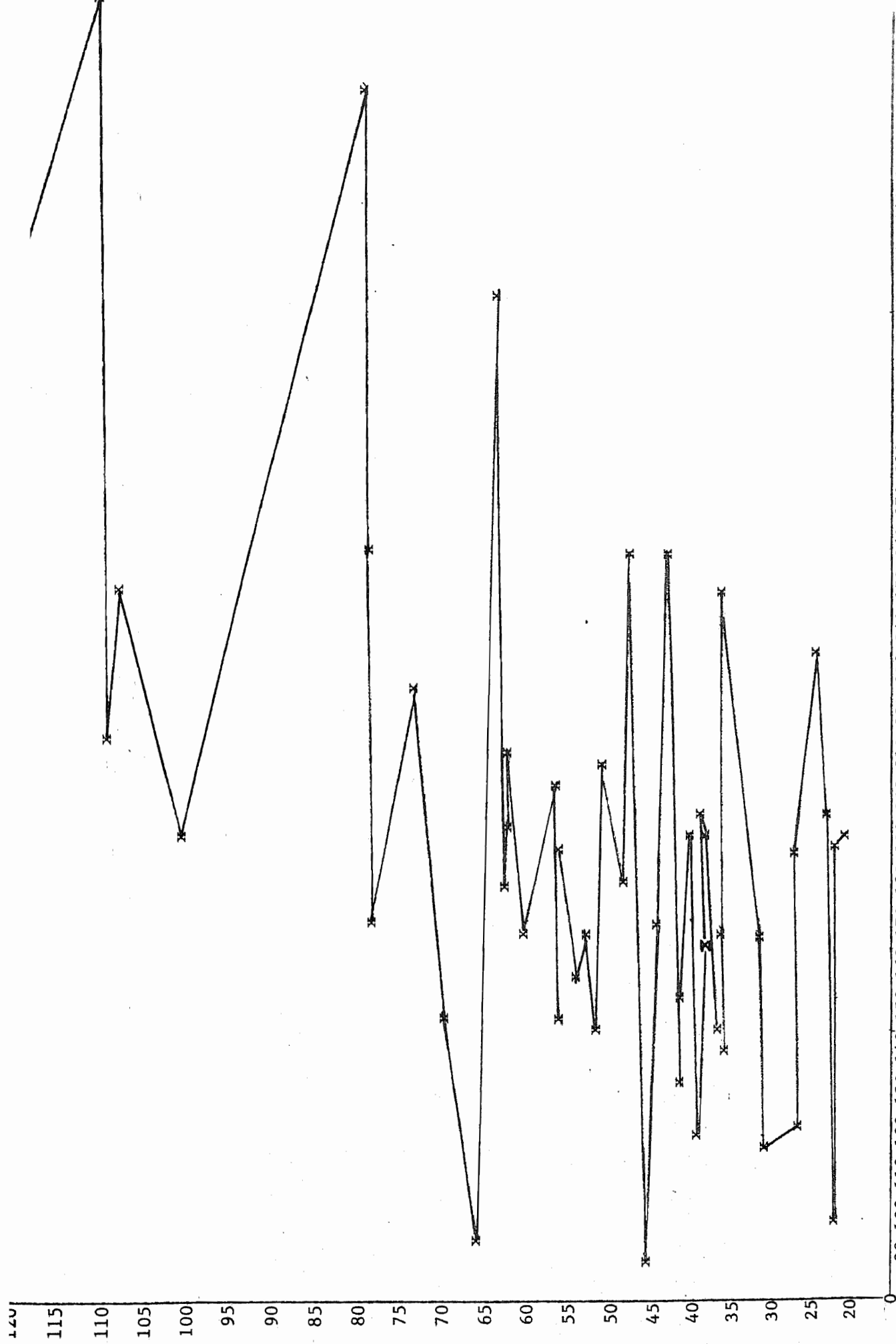


Fig. 1. The Distribution of Interfigure Distance Scores on the Figure Placement Task by the Degree of Field Dependency (Embedded Figures Test Scores)

comparison, would likely be much more aware of these and responsive to them. It would seem then that FD individuals would be more likely to manipulate interfigure distances as a method of depicting various themes, and differentiating individual roles in social interaction, while FI subjects would likely lack such discrimination. FD individuals, proceeding from the minimal ID required according to the conditions of interaction, would likely use varying larger differences to portray these aspects of interaction in the social configuration required on the FPT. This may have contributed to the larger mean distances obtained by FD individuals. The smaller interfigure distances obtained by FI individuals may then reflect the general tendency of such persons to demonstrate less social or interpersonal awareness. In an attempt to explore the validity of this interpretation, the mean interfigure distance scores for all subjects were plotted. These data appear in figure 1. An inspection of figure 1 lends some support to the interpretation presented, in that, there appears to be some tendency toward greater variability among scores and larger interfigure distance as field dependence increases. Interpretation of the FPT in this manner supports the general contention that there is consistency in the mode of experiencing the environment according to the mode of field approach.

An alternative explanation might be advanced for the finding that FD individuals demonstrated greater interfigure distances than FI individuals. As noted previously, FD individuals tend to manifest extraverted behaviours, and extraverts maintain comparatively smaller IDs (Williams, 1963). It is possible that FD individuals perceive the physical distance between others as relatively larger than the distances

they maintain between themselves and others. If the physical distances between others (as represented by the FPT) are perceived as relative to personal distance, then the data for FI individuals lend complementary support to this interpretation.

The ST did not differentiate FD and FI individuals according to ID. Also, there was almost no relationship between ID, as measured by the ST, and field-dependency, as measured by the EFT. The explanation applied to similar results obtained for the SIP would be relevant to these findings as well. The failure to demonstrate a relationship between ID as measured by the ST and field-dependency, and hence the inability to determine differences between FD and FI individuals may be due to the personality characteristics of both which are associated with contradictory behaviour regarding personal space.

The ST did not differentiate FD and FI individuals according to ID when liking and acquaintance were varied. Neither FD nor FI individuals exhibited differences in ID, within groups, either between like/dislike or acquaintance/stranger conditions. These results would lend support to the findings of Holahan and Levinger (1971) which suggest that placement tasks involving a self-referent figure do not reflect psychological distance in interaction. FI subjects maintained the same mean distance between liked and disliked stimuli, in comparison to FD individuals who demonstrated more variation in response to these conditions. The relative lack of discrimination displayed by FI individuals, regarding the distances they maintain between themselves

and various others, infers further support for the explanation that FI individuals are less influenced by and responsive to social or interpersonal situations and therefore demonstrate less discrimination in their social behaviours.

It was noted that all of the means of ID, for both the FD and FI groups fell within the casual-personal zone (18-48 inches), as identified by Hall (1964).

The significant positive relationship between the SIP and the ST scores for paid subjects, and the positive, although non-significant, relationship between these measures of ID for non paid subjects may lend some limited support for the proposition that paper and pencil tasks can reflect actual tendencies regarding ID. Although both are measures of ID, some studies (e.g. Hiat, 1971) failed to find any significant relationship between projective and real measures of approach situations. During administration of the ST in the present study, all subjects were instructed to associate the stimulus figure with a person and a situation they had actually experienced, in order to achieve a more accurate measure of their actual approach tendencies. These instructions may have contributed to the high degree of relationship between the two measures of ID for paid subjects.

The lack of relationship in both paid and non paid groups regarding the measures of ID and the FPT indicates that the FPT measures a different aspect of PS than the other two dependent variables. The inconsistency in the nature of performance across the three PS tasks

lends further emphasis to the conclusions of Dosey and Meisels (1969):

...there was little consistency in the use of the three experimental spatial measures (approach, seating, and silhouettes)...results caution against discussion of personal space without consideration of the method of assessment (p 96).

The analyses revealed large, significant differences between the paid and non paid subjects, for the whole sample, regarding scores on the SIP. The direction of means indicates that paid subjects exhibited a smaller personal space than non paid subjects. It is obvious that the data were based on samples selected from different populations and that a number of variables may have contributed to their differences. However, it would seem plausible that subjects who received monetary reward as well as experimental credit perceived their role as a co-operative one, rather than, initially viewing themselves as experimental participants in a procedure that was marginally associated with routine course requirements, as perhaps non paid subjects did. Cognitive dissonance theory (Festinger, 1957) would lead one to predict that those subjects who were paid two dollars to participate in relatively simple experimental procedures, which were apparently experienced as pleasurable by most subjects, would perhaps feel somewhat obligated to justify to themselves the acceptance of monetary payment. Hence, the dissonance induced by offering payment for participating in what was likely perceived as a positive experience may have facilitated greater involvement in the experimental procedure. Specifically, this interpretation would suggest a greater awareness of, and attention to the task instructions, and task performance, on the part of the paid subjects as a method of reducing

the dissonance created. Following from the latter explanation, paid subjects would be more receptive to the experimenter and the experimental procedures and thus, more likely to tolerate smaller interpersonal distances or perhaps even an invasion of PS by the experimenter.

Page (1968) has demonstrated that when subjects were aware of the demand characteristics of the study and were co-operating, their performance was significantly more effective than subjects who were less aware and less co-operative. The present analysis indicates that paid subjects tended to be more consistent in their behaviour. For example, their performance on the ST, a projective measure of individual distance evidences a highly significant positive correlation with behaviour on the SIP, which was also based on measures of ID, whereas, non paid subjects did not replicate this relationship in their performance on these tasks. If the premise that paid subjects tended to consider the task more seriously is accepted, then paid subjects likely were more ego-involved, attended more closely to the requirements of the tasks, and hence were more careful in their estimates of individual distance on the ST. The in vivo measure of individual distance (SIP scores) would then resemble the projected measures more closely. Paid subjects would be more likely to demonstrate the same, actual, characteristic distances which they maintain between themselves and others on both tasks since this embodies what was required of the subject on both tasks. Paid subjects may have been more aware of the demand characteristics in this study than non paid subjects and were co-operating with them. It is possible that offering payment for experimental participation

may also have caused the recipients to attribute more importance to the nature of the study and to their role as participants. If paid subjects perceived the experimenter and the experimental procedures as more official or attached greater authority to these then it is likely that they would have performed more effectively and co-operated more fully as a result of social control. The influence of demand characteristics and social control on performance has been demonstrated by Orne (1962). Non paid subjects, in contrast, may have considered their role as incidental and the study less important since the reward was minimal and the experimenter made no overt attempts to express authority. The latter interpretation of the performance of paid as compared to non paid subjects may also explain the significant differences between these groups on the ST. That is, non paid subjects may not have attended as closely to task instructions, perceiving their performance, and the task as less important and responded in an impersonal manner, which may have been reflected in the greater distances they displayed between themselves and others on the ST. Less attention to and involvement in task procedures would reduce the ability to represent actual individual distances on a projective measure which also requires that these distances be represented at one eighth the normal size. Larger interfigure distances may have resulted because of this.

The measure of field-dependency, the EFT scores evidenced a highly significant, positive relationship to measures of interfigure distance on the FPT, although this correlation is not closely approximated by the scores of the non paid subjects. A task which has been shown

to differentiate field dependent and field independent individuals likely bears a relationship to the measure of field-dependency. This relationship would be more apparent for subjects who evidenced more ego-involvement in the task situation, since these subjects would be incorporating more of their personality characteristics in their task performance. It is considered probable that paid subjects were performing in this manner, as discussed in the preceding paragraphs. Non paid subjects may have manifested a more impersonal approach to the task situation, more limited task involvement and perhaps a limited expression of personality characteristics in task performance as a result. Therefore, the relationship between the FPT and the EFT scores was not as apparent.

Generally, the present study found no indication of a relationship between PS as reflected by ID, and field-dependence. The findings also reveal a lack of consistency among the measures of PS. Acknowledging the fact that one can never unequivocally accept the confirmation of the null hypothesis, the obtained evidence does lead one to infer that there is, in fact, no relationship between ID and field-dependency, and that there is a lack of consistency among the measures of PS. It is noted, however, that certain methodological factors might be regarded as contributing to the lack of relationship between ID and field-dependence. For example, the present study examined the PS characteristics exhibited by the upper and lower quartiles of a sample of 48 volunteers. It is possible that the limited size of the sample precluded a comparison of the extremes of the field-dependence dimension. A comparison of the upper and lower quartiles obtained on a much larger

sample may have elicited significant differences. Further, there were significant differences between paid and non paid subjects with regard to the measures of ID; payment versus non payment contributed to an obvious source of noise in the design. However, based on the analyses which reveal (a) no significant differences between the upper and lower quartiles regarding ID, and (b) very minimal correlations between scores on the ID tasks and the EFT, there does not appear to be any relationship between PS, as reflected by ID and field-dependence.

Suggestions for Future Research

It is suggested that future research investigate the present status of women with regard to mode of field approach, since the norms obtained on the EFT in the present study were significantly different from those obtained by Witkin (1954). Further, the present norms more closely resemble those for college males, and suggest that the sex differences regarding the mode of field approach may have narrowed in college populations.

The present findings reveal statistically non-significant tendencies for field independents and field dependents regarding individual distances. Differences between groups may have been somewhat minimized due to the observation that females approach closer to the same sex than do males Sommer, 1959; Dosey & Meisels, 1969). In order to eliminate this as a possible confounding influence, future investigations might replicate these procedures with male subjects.

The present results regarding the Figure Placement Task challenge

Kueth's assumption concerning the interpretation of this procedure. The present study has suggested that this task may reflect an awareness of the processes involved in social interaction, rather than approach/avoidance tendencies. In order to verify these implications, administration of the Figure Placement Task might be accompanied by instructions to depict an explicit social theme. The resultant configurations of field dependent and field independent subjects might then be compared as to their ability to convey social themes in terms of variations in interfigure distance and position. Subjects might also be examined regarding the relationship of perceived interpersonal distances between others, as represented by the FPT, to the perceived distances between themselves and others.

In order to further ascertain the relationship of PS to field-dependence, future investigations might compare ID as exhibited by the upper and lower quartiles of a much larger distribution of EFT scores. Sample size should be equivalent to at least 100 subjects, in order to approximate behaviour at the actual extremes of the field-dependence dimension.

The present study indicates that payment versus non payment of subjects contributed to an obvious source of noise in the design. Future studies in this area might replicate these procedures excluding the differential reward variable. Also future research might explore further the effect of payment versus non payment.

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APPENDIX A

Glossary of Notations

- EFT - The Embedded Figures Test developed by Witkin (1950) is designed to measure a subject's ability to separate an item from an embedding context and is considered to be a relatively valid and reliable estimate of field-dependency. The test is further described on pages 12-14, and 48-51.
- FD - The relatively field dependent subject is defined as one who exhibits difficulty in overcoming the influence of the surrounding field. In the present study the FD individual was represented by one who obtained a score on the EFT which was higher than three quarters of the scores obtained by the rest of the subject sample, thus indicating her relative difficulty in separating an item from an embedding context.
- FI - The relatively field independent subject is defined as one who exhibits relative ease in overcoming the influence of the surrounding field. In the present study the FI individual was represented by one who obtained an EFT score which was lower than scores obtained by three quarters of the subject sample, thus indicating her release in overcoming an embedding context.
- FPT - The Figure Placement Task was designed to measure personal space characteristics and is based on the research of Kueth (1962a, 1962b) regarding the representation of social schemas. Objectively, this task measures the perception of the physical distances between persons engaged in social interaction, however, there is some contention as to the interpretation of this task, see pages 30-33. This task is further described on pages 15 and 16.

- ID - Individual distance refers to the actual physical distance between two persons either engaged in social interaction or enclosed within the same physical space. ID usually denotes the face to face (or toe to toe) distance between two individuals.
- PS - Personal space refers the immediate physical area surrounding a person's body which is marked by invisible and irregular boundaries. PS is considered to extend furthest in front, less at the sides and least behind the individual. PS is likened to a portable territory, the boundaries of which expand and contract in accord with various conditions.
- SIP - The Spatial Invasion Procedure employed in the present study is similar to the technique employed by Williams (1963); the SIP represents an in vivo measure of individual distance, and involves an approach situation. In addition to the frontal interpersonal distances, the present study also investigated lateral and rear distances in order to generate personal space areas. The SIP is further described on pages 14 and 15.
- ST - The Silhouettes Task is a paper and pencil task designed to reflect individual distance. This task has been used to examine the relationship of liking and acquaintance to individual distance (Guardo 1969). The ST is further described on pages 16-18.

APPENDIX B

Administration and Scoring of the Embedded Figures Test
Materials

Cards: The test material consists of three sets of cards: two sets of 12 cards with Complex Figures, numbered consecutively in order of test presentation, and a set of 8 cards with Simple Forms, designated by letters A to H. Next to the number on the reverse side of each Complex Figure card is printed the letter identifying the Simple Form which is embedded in that Complex Figure. There is also one Practice Complex Figure card (labelled P-X) and an accompanying card (labelled P) with the Simple Form.

The Complex Figure cards, each of which may be encased in a transparent plastic envelope to prolong its life, may be bound together in numerical order in a small loose-leaf notebook. A piece of transparent plastic may be placed over each card when presented to the Subject.

Stylus: To enable the Subject to trace the outline of the Simple Form in each Complex Figure, a stylus is provided. If the user wishes, he may place a rubber tip on the end of the stylus. Nevertheless, subjects should be instructed to hold the stylus just above the Complex Figure card, and not to touch the card when tracing out the Simple Form.

Stopwatch: A stopwatch is needed with a second hand which can be stopped and restarted without resetting the hand at zero.

Training of Examiner

Before administering the test, the Examiner should practice tracing the appropriate Simple Form in each Complex Figure until he is able to find each one easily. It is also recommended that at least 6 practice tests be given so that presentation of materials and timing are co-ordinated in a smooth and precise manner.

Directions to Subject

The Subject should be seated on the side of the table next to the Examiner so that the Examiner can present the cards and observe the Subject's tracing easily. He then says:

I am going to show you a series of coloured designs. Each time I show you one, I want you to describe it in any way you wish. I will then show you a Simple Form which is contained in that larger design. You will then be given the larger design again, and your job will be to locate the Simple Form in it. Let us go through a practice trial to show you how it is done.

The Examiner shows the Practice Complex Figure (P-X) for 15 seconds. He then covers it by placing the Practice Simple Form (P) over it.

After 10 seconds he says:

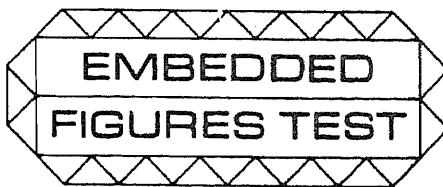
I will now show you the coloured design again and you are to find the Simple Form in it. As soon as you have found the Simple Form let me know, and start tracing the Simple Form with this stylus. When you are tracing, do not let the stylus touch the surface of the card.

The Examiner then exposes the Complex Figure again by removing the Simple Form and turning it over. The Examiner now starts timing from zero. As soon as the Subject says he sees the Simple Form, the Examiner notes the time; if the Subject traces the Form correctly, this time is recorded on the data sheet as the solution time for the Practice Item.

Subjects usually have no difficulty finding the Simple Form in the Practice Complex Figure. If a Subject does have trouble, the Examiner may expose the Simple Form again and show the Subject where it is located in the Complex Figure.

After the Practice Item, the Examiner then says:

This is how we will proceed on all trials. In every case the Simple Form will be present in the larger design. It will always be in the upright position, so don't turn the card around. There may be several of the Simple Forms in the same design, but you are to find and trace only one. Work as quickly as you possibly can, since I will be timing you, but be sure that the form you find is exactly the same as the original Simple Form in shape, size and proportions. As soon as you have found the form, tell me at once and then start to trace it. If you ever forget what the Simple Form looks like, you may ask to see it again, and you may do so as often as you like. Are there any questions?



Response Record

NAME _____ SEX: M F AGE _____ DATE _____

GROUP _____ EXAMINER _____

Form Administered: A (Items 1-12) B (Items 13-24) Practice Item: Solution Time _____

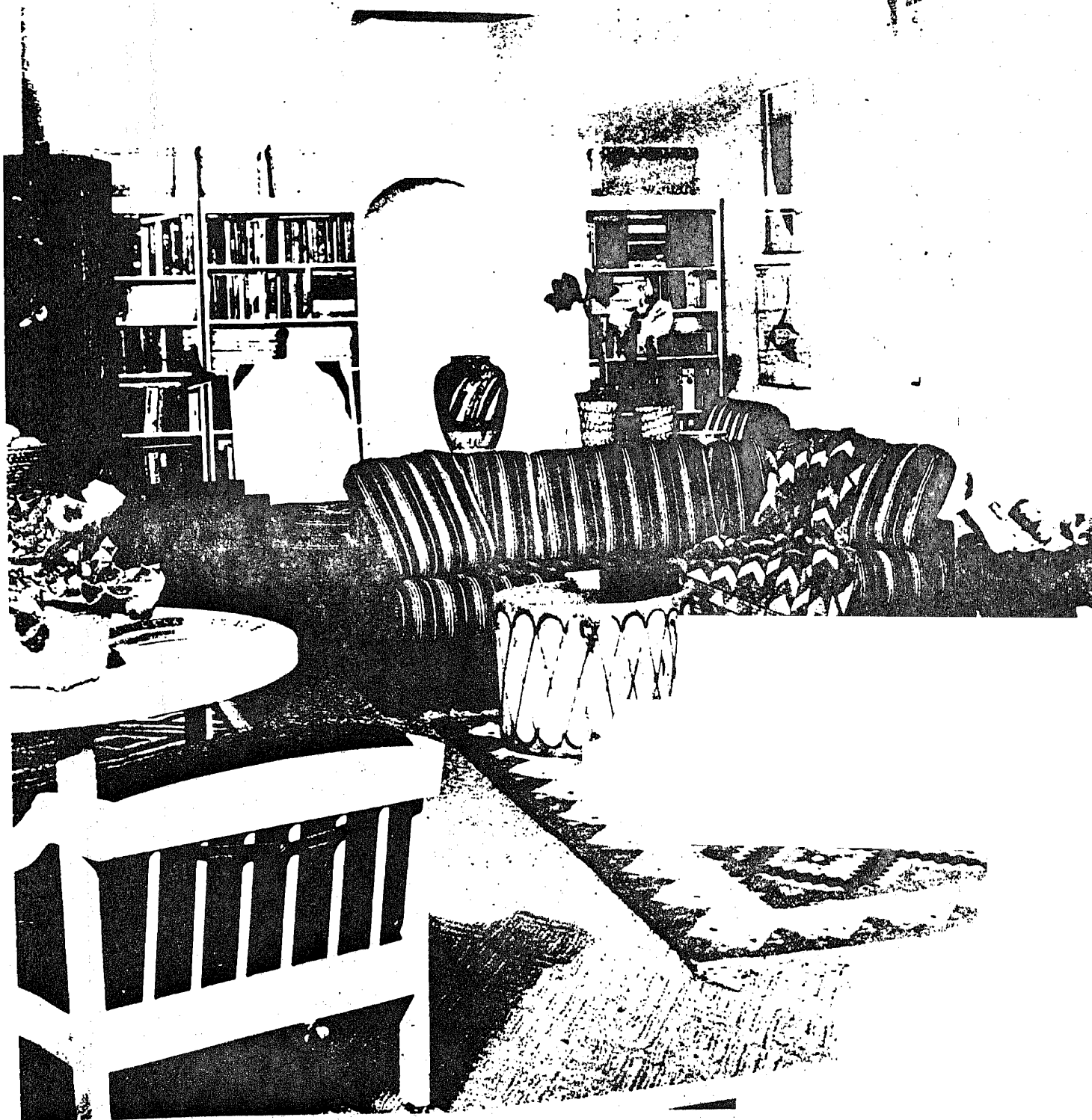
Item No.	Comments	Time Data	Solution Time (in seconds)
1-A or 13-E			
2-B or 14-C			
3-C or 15-D			
4-D or 16-G			
5-E or 17-A			
6-A or 18-E			
7-F or 19-B			
8-E or 20-C			
9-C or 21-G			
10G or 22-A			
11-A or 23-E			
12-H or 24-C			

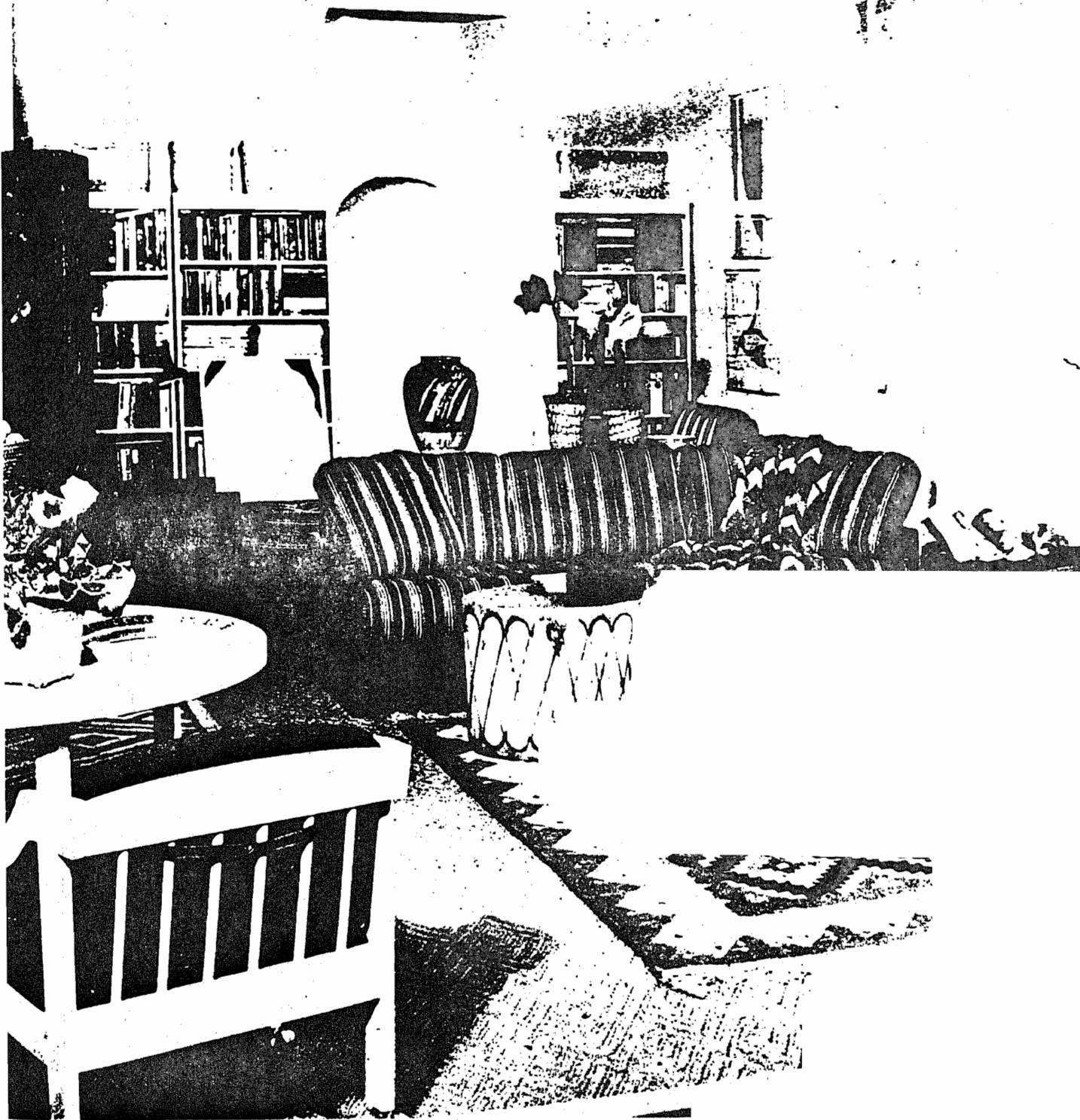
COMMENTS:

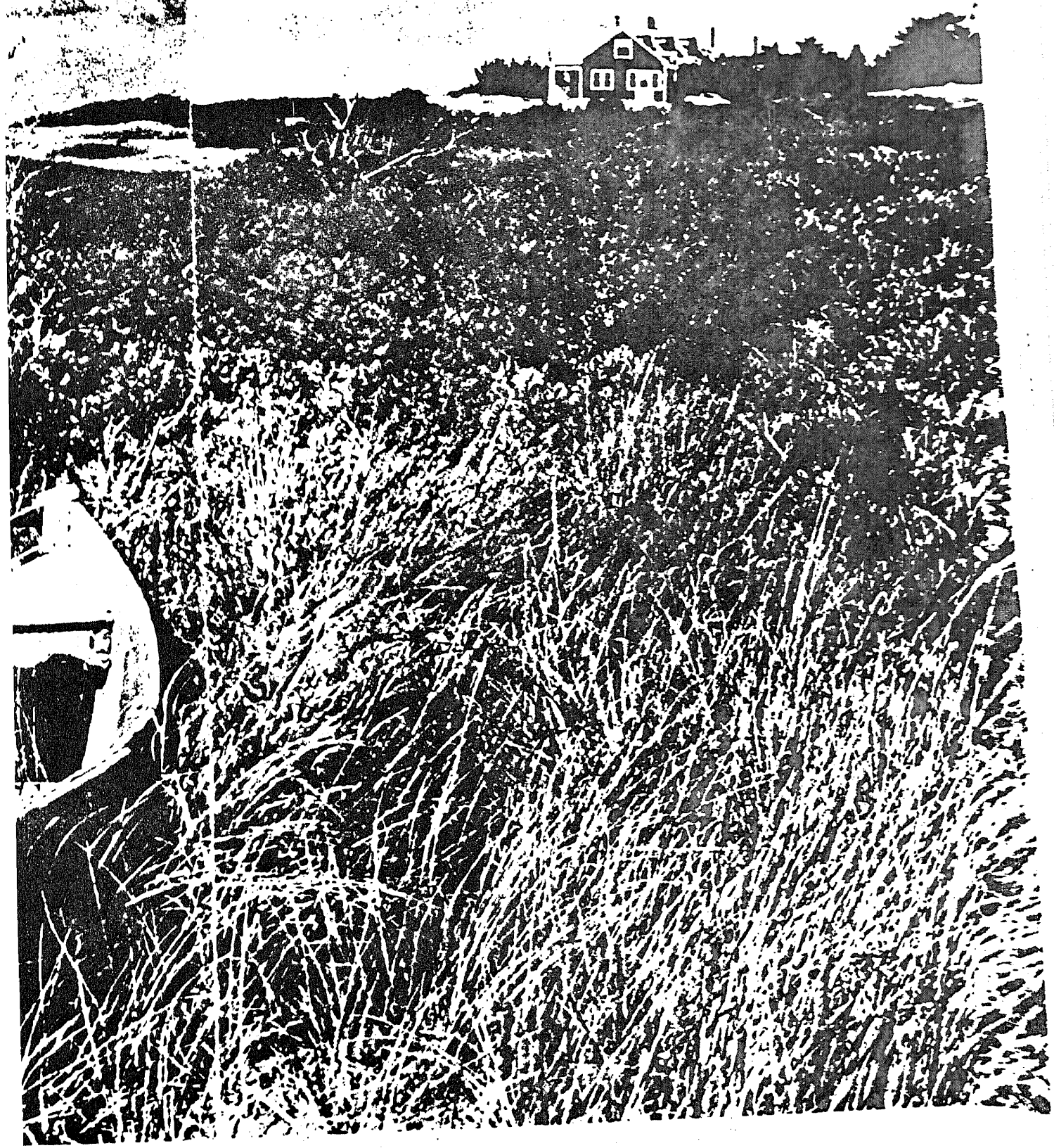
TOTAL TIME (in seconds)

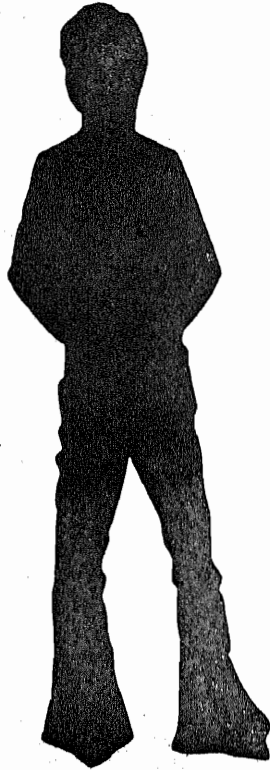


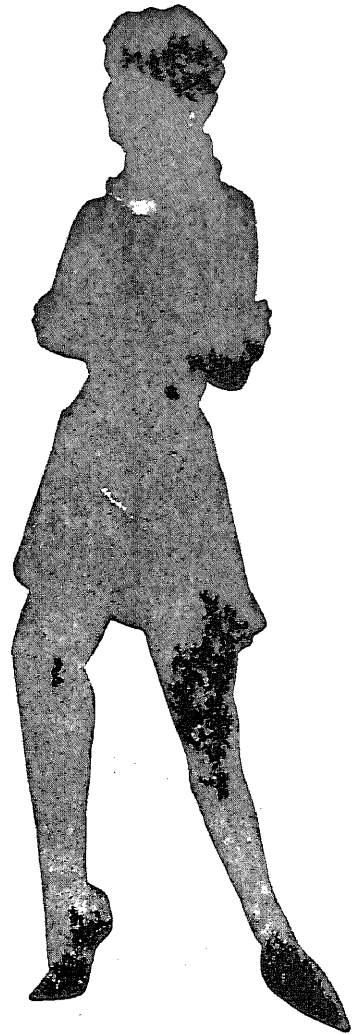
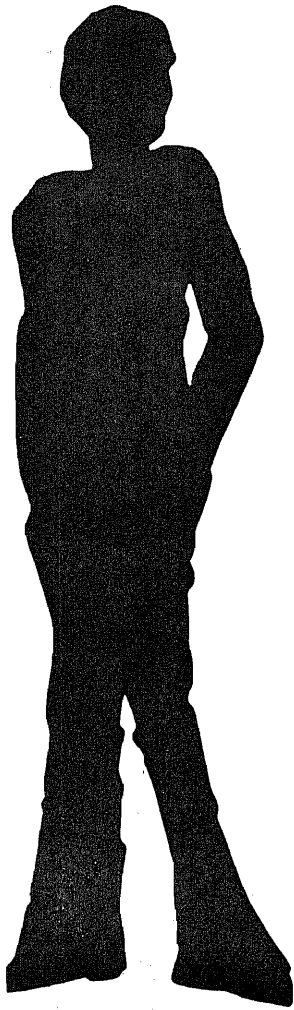
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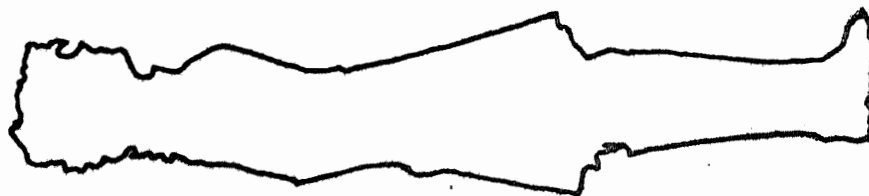
APPENDIX D

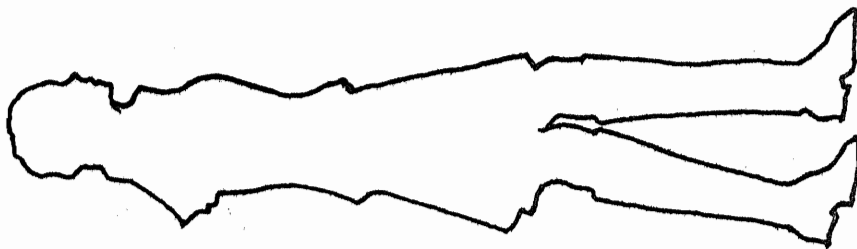
Materials for the Silhouettes Task

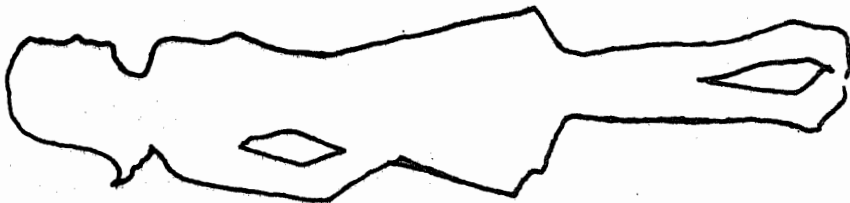
(scaled)



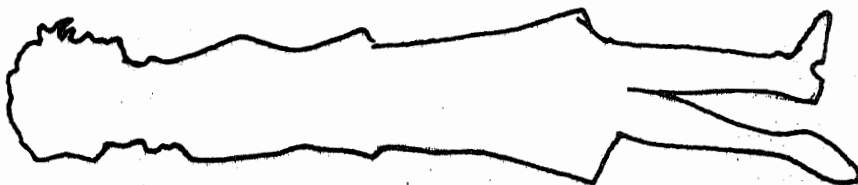


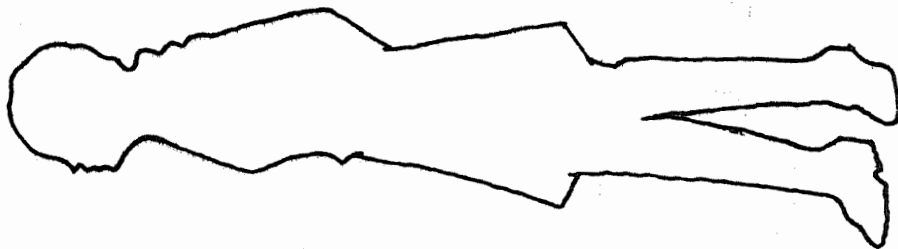












APPENDIX E

Means, Standard Deviations, and t Values of Individual Distance
When Liking and Acquaintanceship are Varied on the Silhouettes Task
for the Relatively Field Dependent and Field Independent Groups.

Means, Standard Deviations, and t Values of Individual Distance When
Liking is Varied for the Relatively Field Dependent (FD) and Field
Independent Groups (FI)

Group	Like				Dislike			
	N	M	SD	t	N	M	SD	t
FD	12	2.69	1.04	-1.003*	12	3.43	1.41	0.414*
FI	12	3.21	1.38		12	3.22	0.93	

*p > .20

Means, Standard Deviations, and t Values of Individual Distance When
Acquaintanceship is Varied for the Relatively Field Dependent (FD)
and Field Independent (FI) Groups

Group	Acquaintance				Stranger			
	N	M	SD	t	N	M	SD	t
FD	12	3.41	1.52	-0.216*	12	3.61	1.51	-0.461*
FI	12	3.51	0.24		12	3.92	1.65	

*p > .20

APPENDIX E (continued)

t Values and Significance Levels for Within Group Comparisons
of Individual Distance Means When Liking and Acquaintanceship
is Varied

Group	Like/Dislike	p	Acquaintance/Stranger	p	Like/Stranger	p
FD	1.406	>.20	-0.311	.20	-1.672	>.20
FI	-0.020	>.20	-0.820	.20	-1.099	>.20

Data

Data for All subjects on the Experimental Procedures

S#	EFT	SIP(PSA)	FPT	ST
1	30.91	865.68	1.14	3.26
2	44.83	1382.77*	1.69	2.94
3	62.75	166.88	1.84	5.93
4	31.50	149.85	1.64	6.36
5	55.91	1698.24*	1.99	8.04
6	41.16	661.50	1.50	6.86
7	52.00	935.81	1.69	4.16
8	36.83	711.56	1.97	3.02
9	26.25	468.55	1.20	4.46
10	22.16	491.61	1.97	2.75
11	50.83	643.40	2.05	4.58
12	55.75	1267.87*	1.44	6.77
13	35.41	121.50	1.37	3.36
14	38.66	168.19	1.18	3.32
15	125.25	74.25	2.75	2.67
16	42.66	787.00	2.54	4.52
17	55.42	244.68	1.82	2.94
18	109.83	148.50	2.05	3.62
19	112.41	155.25	3.81	4.58
20	26.50	28.66	1.86	2.87
21	67.33	142.31	1.46	3.65
22	63.75	277.87	3.15	5.18
23	35.33	209.25	2.48	5.87
24	51.75	216.81	1.44	3.28
25	35.66	225.00	1.68	2.20
26	37.00	252.15	1.62	3.46

Data for All Subjects (continued)

S#	EFT	SIP (PSA)	FPT	ST
27	36.50	64.26	1.90	3.54
28	41.66	2.42	1.30	4.48
29	61.33	29.48	2.08	3.96
30	65.83	75.94	0.92	1.73
31	46.83	954.32	1.80	5.04
32	61.41	307.85	1.90	4.04
33	36.83	1.26	1.41	2.34
34	21.83	60.74	0.98	2.58
35	20.50	36.56	1.89	2.58
36	78.83	33.66	2.55	3.85
37	20.58	307.12	1.87	3.75
38	81.00	10.12	3.63	1.36
39	59.58	136.65	1.66	3.52
40	39.33	9.92	1.90	3.81
41	100.50	1338.75*	1.85	5.75
42	73.16	212.06	2.23	2.10
43	45.58	175.63	0.87	2.89
44	77.75	74.25	1.67	4.36
45	53.41	19.26	1.55	4.02
46	47.41	385.61	2.53	5.30
47	108.42	111.37	2.41	3.34
48	24.58	0.00	2.34	4.04

*The PS areas for these Subjects differed significantly from the rest of the sample ($p < .05$).

<u>Code</u>	<u>Variable</u>
S#	Subject Number
EFT	Embedded Figures Test Scores
SIP (PSA)	Spatial Invasion Procedure, Scores of Personal Space
FPT	Figure Placement Task Scores
ST	Silhouettes Task Scores

Summary of the Data for the Paid Volunteers

S#	EFT	SIP (PSA)	FPT	ST
15	125.25	74.25	2.75	2.67
16	42.66	787.00	2.54	4.52
17	55.42	244.68	1.82	2.94
18	109.83	148.50	2.05	3.62
19	112.41	155.25	3.81	4.58
20	26.50	28.66	1.86	2.87
21	67.33	142.31	1.46	3.65
22	63.75	277.87	3.15	5.18
23	35.33	209.25	2.48	5.87
24	51.75	216.81	1.44	3.28
25	35.66	225.00	1.68	2.20
26	37.00	252.15	1.62	3.46
27	36.50	64.26	1.90	3.54
28	41.66	2.42	1.30	4.48
29	61.33	29.48	2.08	3.96
30	65.83	75.94	0.92	1.73
31	46.83	954.32	1.80	5.04
32	61.41	307.85	1.90	4.04
33	36.83	1.26	1.41	2.34
34	21.83	60.74	0.98	2.58
35	20.50	36.56	1.89	2.58
36	78.83	33.66	2.55	3.85
37	20.58	307.12	1.87	3.75
38	81.00	10.12	3.63	1.36
39	59.58	136.65	1.66	3.52
40	39.33	9.92	1.90	3.81

<u>Code</u>	<u>Variable</u>
S#	Subject Number
EFT	Embedded Figures Test Scores
SIP (PSA)	Spatial Invasion Procedure, Scores of Personal Space Areas
FPT	Figure Placement Task Scores
ST	Silhouettes

Summary of the Data for the Non Paid Volunteers

S#	EFT	SIP(PSA)	FPT	ST
1	30.91	865.68	1.14	3.26
2	44.83	1382.77*	1.69	2.94
3	62.75	166.88	1.84	5.93
4	31.50	149.85	1.64	6.36
5	55.91	1698.24*	1.99	8.04
6	41.16	661.50	1.50	6.86
7	52.00	935.81	1.69	4.16
8	36.83	711.56	1.97	3.02
9	26.25	468.55	1.20	4.46
10	22.16	491.61	1.97	2.75
11	50.83	643.40	2.05	4.58
12	55.75	1267.87*	1.44	6.77
13	35.41	121.50	1.37	3.36
14	38.66	168.19	1.18	3.32
41	100.50	1338.75*	1.85	5.75
42	73.16	212.06	2.23	2.10
43	45.58	175.63	0.87	2.89
44	77.75	74.25	1.67	4.36
45	53.41	19.26	1.55	4.02
46	47.41	385.61	2.53	5.30
47	108.42	111.37	2.41	3.34
48	24.58	0.00	2.34	4.04

* Subjects' scores on the Spatial Invasion Procedure differed significantly from the rest of the sample (p .05).

<u>Code</u>	<u>Variable</u>
S#	Subject number
EFT	Embedded Figures Test Scores
SIP(PSA)	Spatial Invasion Procedure, Scores of Personal Space Areas
FPT	Figure Placement Task Scores
ST	Silhouettes Task Scores

Summary of the Data for the Relatively Field Dependent Group

S#	EFT	SIP (PSA)	FPT	ST
15	125.25	74.25	2.75	2.67
19	112.41	155.25	3.81	4.58
18	109.83	148.50	2.05	3.62
47	108.42	111.37	2.41	3.33
41	100.50	1338.75*	1.85	5.75
38	81.00	10.12	3.63	1.36
36	78.83	33.66	2.55	3.85
44	77.75	74.25	1.67	4.35
42	73.16	212.06	2.23	2.09
21	67.33	142.31	1.46	3.66
30	65.83	75.94	0.92	1.73
22	63.75	277.87	3.15	5.18

*Subject differed significantly from rest of the sample ($p < .05$)

<u>Code</u>	<u>Variable</u>
S#	Subject number
EFT	Embedded Figures Test Scores
SIP (PSA)	Spatial Invasion Procedure, Scores of Personal Space Areas
FPT	Figure Placement Task Scores
ST	Silhouette Task Scores

Summary of the Data for the Relatively Field Independent Group

S#	EFT	SIP(PSA)	FPT	ST
25	35.66	225.00	1.68	2.20
13	35.41	121.50	1.37	3.35
23	35.33	209.25	2.48	5.87
4	31.50	149.85	1.64	6.36
1	30.91	865.68	1.14	3.26
20	26.50	28.66	1.86	2.87
9	26.25	468.55	1.20	4.44
48	24.58	0.00	2.34	4.03
10	22.16	491.61	1.97	2.75
34	21.83	60.74	0.98	2.58
37	20.58	307.12	1.87	3.75
35	20.50	36.56	1.89	2.58

CodeVariable

S#	Subject number
EFT	Embedded Figures Test Scores
SIP(PSA)	Spatial Invasion Procedure, Scores of Personal Space Areas
FPT	Figure Placement Task Scores
ST	Silhouettes Task Scores

Individual Distance Data from the Spatial Invasion Procedure for the
Relatively Field Dependent and Field Independent Groups in Inches

S#	CID	FD	AID	CCD	S#	CID	FI	AID	CCD
15	0.00		0.00	0.00	25	4.50		9.75	15.00
19	4.50		9.00	13.50	13	4.50		6.75	9.00
18	4.50		9.00	13.50	23	12.00		15.00	18.00
47	3.00		5.25	7.50	4	6.50		10.87	15.00
41	27.00		30.75*	34.50	1	16.50		21.75	27.00
38	0.50		6.75	13.50	20	0.50		3.37	6.00
36	13.50		17.25	21.00	9	10.50		19.50	28.50
44	6.00		9.00	12.00	48	4.50		7.50	10.50
42	10.50		12.75	15.00	10	10.50		21.75	33.00
21	4.50		11.25	18.00	34	4.50		8.25	12.00
30	6.00		9.00	12.00	37	13.50		19.50	25.50
22	9.00		15.00	21.00	35	3.00		6.00	9.00

*Subject's score on the Spatial Invasion Procedure differed significantly from the rest of the sample ($p < .05$).

<u>Code</u>	<u>Variable</u>
FD	Relatively Field Dependent Subject
FI	Relatively Field Independent Subject
S#	Subject number
CID	Critical Individual Distance (frontal)
AID	Average Individual Distance (frontal) i.e. $CID + CCD \div 2$
CCD	Comfortable Conversational Distances (frontal)