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GENERALIZATION GRADIENTS AND RESPONSE CUES
IN THE EXPRESSION OF DEPENDENCY

by
Gerald Anthony Kucera

A Dissertation Submitted to the Faculty of the
DEPARTMENT OF PSYCHOLOGY
In Partial Fulfillment of the Requirements
For the Degree of
DOCTOR OF PHILOSOPHY
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THE UNIVERSITY OF ARIZONA
GRADUATE COLLEGE

I hereby recommend that this dissertation prepared under my
direction by Gerald Anthony Kucera
entitled GENERALIZATION GRADIENTS AND RESPONSE CUES
IN THE EXPRESSION OF DEPENDENCY
be accepted as fulfilling the dissertation requirement of the
degree of Doctor of Philosophy

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ABSTRACT

This study was undertaken in order to provide data on a point of theoretical disagreement between the theory of Neal Miller and that of Bandura and Walters regarding the importance of generalization gradients in the expression of social response. While generalization gradients were central to Miller's theory of displacement, Bandura and Walters asserted that such gradients are relatively meaningless, since patterns of reward and punishment provided by parents and other socialization agents have no consistent relationship to similarity of the parents to other objects of social response. The social response selected for study was dependency, defined as "a tendency to seek proximity, physical contact, help, reassurance, or approval."

Two groups of 108 eighth grade boys who were the better readers in two Tucson junior high schools participated in the study. They completed the Dependency Questionnaire (DQ), an instrument developed for the study, which assesses likelihood of dependent response to father, male teacher, and team-mate over positive, neutral, and negative cues for dependency. In order to provide DQ validation, they completed the Jr.-Sr. High School Personality Questionnaire (HSPQ). A Semantic Differential (SD) measured the stimulus similarity of the three objects on the evaluative,

potency, and activity dimensions. After a two-week interval, subjects recompleted the SD and DQ in order to estimate the test-retest reliabilities of the measures.

Effects of cues and objects in the DQ were tested in a three way analysis of variance design. The mean dependency scores to father, teacher, and team-mate were used to generate hypotheses regarding the relative locations of the objects in semantic space. Correlations were also obtained between DQ and SD ratings for each object.

The test-retest reliability of the DQ, as described by the product-moment correlation coefficient (r), was .79. The reliabilities of the SD scales were: evaluation .69, potency, .69, and activity .52. The DQ showed significant correlations with the HSPQ factors measuring excitability (D+), enthusiasm (F+), social boldness (H+), tendermindedness (I+), zestfulness (J-), and group dependency (Q_2 -). Marked variations in magnitude of correlation were noted, however, between schools and between objects.

Significantly more dependent responses were elicited by positive cues for dependency while the neutral-negative difference was not significant. Father and team-mate were significantly more frequent objects of dependency than was male teacher, and the father-team-mate difference was not significant. The effect of cues ($F = 149.20; 209.62$) was considerably more powerful than the effect of objects ($F = 19.43; 32.65$).

Non-parametric and correlational analyses of the relationships between DQ object dependency and SD ratings of the objects did not convincingly demonstrate the existence of generalization gradients. The placement of the objects on the SD evaluation, potency, and activity dimensions did not significantly correspond to the placement hypothesized on the basis of the DQ results. No SD dimension was sufficiently general, over objects and schools, to serve as a basis for generalization gradients. Data supporting Miller's formulation were not obtained.

The results were consistent with the notion that behavior is relatively situation specific and heavily influenced by cues available at the time. Since the dimensions along which generalization of social response occurs remain undescribed, it is premature to rely on generalization processes as effective and predictable agents of response transfer for therapeutic purposes. The demonstrated effectiveness of cues in eliciting social response indicates that cues should be given more theoretical and practical interest.

INTRODUCTION

Dependency has been defined by social learning theorists as "a tendency to seek proximity, physical contact, help, reassurance, or approval" and "a class of responses that are capable of eliciting positive attending and ministering responses from others [Bandura and Walters, 1963, pp. 137, 139]." Attention-seeking, seeking help or advice, clinging, and crying would be considered examples of dependent response. Since dependent responses are by definition capable of eliciting positive attending and ministering responses from others, they are theoretically important in understanding processes of human social interaction and socialization.

The present study was designed to clarify a theoretical issue concerning dependent response. The background for the study involves the description of this issue and a selective review of the relevant literature.

Theoretical Considerations

Many theories have been developed at various times to organize and encompass the data concerning social responses such as dependency. The learning theorists have attempted to apply the principles of learning to understanding human social responses, and they have used concepts

such as stimulus, response, reinforcement, and extinction quite successfully in their theory-building efforts.

As new theories have been introduced, between-theory differences in emphasis have become apparent. At times the differences have resulted in points of clear theoretical disagreement. One such difference has been made explicit between the theories of Miller (1948) and Bandura and Walters (1963). Although both are learning theories, they differ regarding the role of generalization gradients in displacement phenomena.

Miller and his colleagues originally attempted to describe the major phenomena discussed by Freud in learning theory terms, and Personality and Psychotherapy (Dollard and Miller, 1950) was an early summary of their attempts. In 1948 Miller reported his theory relating Freud's concept of displacement to the learning principle of stimulus generalization (Miller, 1948). Miller illustrated displacement by the following example: A child is behaving aggressively toward schoolmates and teachers. Investigation reveals that he hates his foster parents and originally had attempted to aggress toward them. They punished these aggressive behaviors. Then the aggressive school behaviors appeared. When the child's hatred toward his foster parents is resolved, his school behavior improves. The transfer of aggression from the home situation to the school situation would exemplify displacement. In Miller's example, displacement

was illustrated by the fact that the frequency and magnitude of the social response (aggression) were actually higher toward a new object than toward the original object.

Miller's theoretical account of displacement used related principles of stimulus generalization and generalization gradients. These principles were first illustrated in Pavlov's conditioning experiments (Miller, 1948). A dog was conditioned to salivate to a tone of a specific pitch. When tones of different pitches were then presented for the first time, their presentation was also followed by salivation. The transfer of response from the original stimulus situation to the new stimulus situation was termed stimulus generalization. Pavlov also found that the more similar the pitch of the new tone was to the pitch of the originally conditioned tone, the larger was the response to the new tone. The graded response in terms of stimulus similarity was termed the generalization gradient.

Miller's theory of displacement (Miller, 1948) used the principle of generalization and associated generalization gradients to predict strength of social responses to objects in the social environment. Five assumptions were needed to deduce the tendency for displacement to occur in situations in which the direct response to the original stimulus was prevented by either absence of the original object or by the conflict introduced by fear of the direct response. His assumptions were:

(1) that the direct response to the original stimulus generalizes to other similar stimuli, with the amount of generalization becoming smaller the less similar the stimuli; (2) that the response which conflicts with the occurrence of the direct response to the original stimulus also generalizes to the other stimuli, becoming weaker the less similar the stimuli; (3) that the gradient of generalization of the conflicting response falls off more steeply with dissimilarity than does that of the original response which it inhibits; (4) that when two or more incompatible responses are simultaneously excited, the one with the greatest net strength will be the one which will occur; and (5) that the net strength of a response will be its strength minus that of any response incompatible with it which is excited at the same time (pp. 167-168).

The five assumptions were then the basis for explaining the phenomenon of displacement, and were also used to deduce new hypotheses about displacement. It is not necessary to describe the theory further. It is important however, to point out the basic centrality of generalization gradients in the theory. The existence of generalization gradients is central to the first three theoretical assumptions. Miller did limit his theory of displacement to a relatively specific set of circumstances, that set in which, through conflict or absence of the object, the direct response to the object was inhibited. He realized that the consequences of the new response determined its later strength. If it were punished or not rewarded, the frequency would decrease. He also realized that verbal labeling could lead to finer discriminations and therefore to limited generalization. He nevertheless did emphasize

the importance of generalization processes and gradients of generalization in his displacement theory.

In Social Learning and Personality Development, Bandura and Walters (1963) presented their contributions to personality applications of learning theory, extending the work of Miller and other learning theorists. They disagreed explicitly, however with Miller's learning theory formulation of displacement. The basis for their disagreement was as follows:

One reason for the inadequacy of Miller's displacement model is that it adopts a basically non-social approach to a problem in social learning. According to this model, the objects and strength of displaced responses can be predicted from knowledge of three variables only--the strength of instigation, that is, the approach tendencies to the frustrating agent; the severity of punishment of these responses; and a stimulus-similarity dimension. The theory thus ignores the influence of the original agents of frustration and punishment in determining responses toward stimulus objects other than themselves. In fact, parents often through precept, example, and control of reinforcement contingencies determine rather precisely the kind of displaced responses that a child will or will not exhibit. Displaced aggression is further modified by the responses it elicits from other socializing agents and from the objects of the aggression themselves. Miller's generalization gradients thus become relatively meaningless for a human-learning situation in which the patterns of reward-punishment contingencies displayed by parents and other agents of socialization have no consistent relationship to the similarity of the parents to possible objects of aggression (pp. 19-20).

There were two points of theoretical disagreement in the above statement. Bandura and Walters denied the importance of generalization gradients based upon similarities

between parents and other objects of social response, and they emphasized the role of contingencies created by the parents, other socializing agents, and objects of social response. Such contingencies, they asserted, bear no consistent relationship to generalization gradients. The present study was primarily undertaken in order to evaluate the influence of generalization gradients in social response, and therefore to reflect upon the above points of theoretical disagreement.

Dependent responses were chosen to exemplify social response because of their intrinsic importance. Both theories assumed that dependent responses and aggressive responses obeyed the same principles. Since dependent responses are more socially appropriate than are overt aggressive responses, they would also perhaps be reported more accurately.

Two major ways were chosen to evaluate the theoretical difference noted. The first involved a search for the effect of generalization gradients in the expression of dependent response. If evidence for such gradients were discovered, Miller's displacement theory would be supported. If evidence for generalization gradients were not found, then Bandura and Walters' statements would, by default, be supported. Also, if it could be demonstrated that another variable, for example response cues, was highly related to the frequency and magnitude of dependent response, then the

influence of generalization gradients would be reduced in theoretical importance, even though the two theories might not differ as to the effectiveness of that variable.

The means chosen to evaluate the theoretical difference in the present study was to measure the effects of different dependency objects (father, teacher, and peer) and different response cues for dependency (positive, neutral, and negative) upon expression of dependency. The magnitudes of the objects and cues effects would be compared. The strength of dependency reported to the different objects would then suggest hypotheses concerning object similarity. The derivation of the hypotheses would be possible because (1) in order for generalization gradients to be important, there must be underlying dimensions along which generalization could occur and (2) the amount of dependency expressed should be correlated, according to Miller, with measures of stimulus similarity. If such correlations were not discovered, and no dimensions were related, the theory of displacement would not be supported.

The theoretical points may now be formally stated as the hypotheses of interest, the similarity and the response-cuing hypotheses. They are stated in terms of the measures used to test them. The rationale for selection of measures is stated in a later section.

The Similarity Hypothesis

A significant portion of the variance in dependent expression is accounted for by differences between parents, peers, and teachers. The amount of dependency shown, in seeking help or advice, talking with, suggesting a mutual activity, and feelings of being comfortable with the object, is significantly correlated with either perceived evaluation, potency, or activity of the object as measured by the Semantic Differential (SD).

The Response-Cuing Hypothesis

A significant portion of the variance in expression of dependency is accounted for by knowledge of the cues presented by the object, and dependent expression in seeking help or advice, talking with, suggesting a mutual activity, and feeling comfortable with the object, is related to whether the object presents positive, neutral, or negative cues for dependency.

Selected Studies of Dependent Response

A number of studies have been directed toward the variables underlying dependent response. They include studies concerned with the effects of positive reinforcement and punishment of dependent response. Other studies have provided evidence for generalization of dependent response, although there have been as yet no convincing demonstrations of generalization gradients underlying dependent response.

Several studies have shown that situational cues are strongly related to expression of dependent response.

Effects of Positive Reinforcement

Relatively few studies have been conducted to explore the effects of positive reward upon level of dependent response. Most of these studies have attempted to relate relatively non-specific parental characteristics to dependent response. A typical method has been, for example, to measure a non-specific variable such as parental nurturance (the tendency to positively reinforce dependency and to encourage warm, positive emotional responses toward the object of dependency) in parent interviews. The parental measure is then correlated with various behavioral measures of dependency. The studies have provided evidence that the degree to which parents reward dependent response is positively related to the amount of dependency that children exhibit.

Sears, Maccoby, and Levin (1957) found that mothers who were affectionately demonstrative tended to positively reinforce dependent responses by their children. Nelsen (1963) found that positive verbal reinforcement for dependency in an experimental situation led to an increase in dependent responses, while mild rebukes following dependent responses led to a decrease in the frequency of

dependent behavior. The effects of reward were more marked for girls than for boys.

Data on dependent responses exhibited by pre-adolescent boys were collected in studies by Bandura (1963) and Bandura and Walters (1959). The major focus in both studies was upon aggressive behavior, however data on dependency were also collected. In the 1959 study, Bandura and Walters studied adolescent aggressive boys, while in 1963 Bandura studied younger pre-adolescents who were either non-aggressive (inhibited), or aggressive. Their studies provided dependency data which included some interesting age-related changes in the expression of dependency.

Bandura (1963) found that the parents of dependent boys were warmer, more affectionate, rewarded dependency to a greater extent, and spent more time caring for their sons than did parents of non-dependent boys. Similar parental characteristics were also reflected in thematic interview material collected from the inhibited boys.

The findings were similar in the older adolescent group (Bandura and Walters, 1959). Parents of the dependent non-aggressive youths tended to be rated as warmer than those of the aggressive, relatively non-dependent adolescents. Fathers of the dependent boys were additionally more affectionately demonstrative.

The results have suggested that diffuse parental characteristics reflecting the presentation of positive rewards for dependency tend to be positively related to dependent expression in their children.

Effects of Punishment, Rejection, and Withholding of Positive Reinforcement

The distinction between positive reinforcement of a particular behavior and punishment of that behavior is theoretically clear. It is almost never the case, however, that one type of contingency occurs alone in the absence of the other. Behaviors are rewarded at certain times, punished at others, and schedules of reward and punishment vary from one time and place to another. A schedule of intermittent punishment, with interspersed rewards, is in some ways equivalent to an intermittent schedule of reward, and can result in stable increases in frequency of response. These facts may account for some of the seemingly paradoxical effects of punishment which will be reported, for example the result that parental rejection has been found to relate positively to dependent expression in some cases, and to be negatively related in others.

Sears et al. (1957) found that there was little relationship between parental rejection and level of dependent expression when few rewards for dependency were present. When rewards for dependency were present in a

context of non-specific rejection, rejection was positively related to dependency.

Gewirtz (1954) found that nursery school children displayed more dependency in the presence of a non-responsive adult than in the presence of a child-centered adult who responded positively to dependent responses. His finding is congruent with those of other studies which have indicated that when dependency responses to frustration are high in the response hierarchy, withholding of positive rewards produces more sustained increases in dependency response than if dependency responses to frustration are low in the response hierarchy (Baer, 1962; Beller and Haerberle, 1963a, 1963b).

Studying a group of pre-school children, Sears, Whiting, Nowlis, and Sears (1953) found some support for their hypothesized curvilinear relationship between maternal frustration and punishment for dependency, and amount of dependency exhibited by the children. They found that two measures of dependency in pre-school correlated positively with two measures of feeding frustration but did not correlate with measures of severity of toilet training. A positive correlation between current punitiveness and non-nurturance and pre-school dependency was noted for boys but a negative correlation was obtained for girls.

Similarly, Moore (1965) found that use of punishment reported in parent interviews was positively correlated with

measures of dependency in nursery school. Severe demands and restrictions were associated with high dependency for girls. High autonomy in girls was related to maternal rejection and high father interest, while lack of demands, low hostility, and availability by the father were related to autonomy in boys.

While withholding of positive rewards seems to lead to an increase in dependent response when dependent responses to frustration are higher in the response hierarchy, active punishment appears to reduce its incidence unless there is relatively frequent concurrent reward. Nelsen (1963) found that mild rebukes for dependency resulted in a decrease in dependent responses. Bandura and Walters (1959), studying adolescent aggressive boys, found that parental rejection was negatively related to parental punishment for dependency, and that parents who were rejecting had sons who were less dependent than did parents who were more accepting. Boys who felt rejected by their parents expressed less dependency toward parents, teachers, and peers.

Their results for aggressive adolescent boys were in marked contrast to their results obtained with aggressive and inhibited pre-adolescents. In the pre-adolescent group, punishment for dependency decreased its directness but statistically significant relationships between punitiveness for dependency and frequency of dependent response were

largely absent. An exception occurred in the case of the aggressive boys, where maternal punishment for dependency was related to increased dependency to adults. It was hypothesized that the mothers of these boys did not reinforce low-level dependency responses but were forced to attend to more extreme forms. The non-aggressive pre-adolescent youths, it seemed, more typically responded to maternal dependency frustration by withdrawal and by increased dependency toward peers.

Bandura (1963) noted another significant difference between the adolescents of his 1959 study and the pre-adolescents studied in 1963. While the pre-adolescent aggressive youths showed a great deal of dependency in relatively extreme form to parents, peers, and teachers, the aggressive adolescents showed relatively low levels of dependency. Bandura and Walters (1963) hypothesized that, because of their relative youthfulness, pre-adolescents are necessarily more dependent, and further that they receive intermittent rewards as well as mild punishment for their dependency attempts. Later, in adolescence, they tend to elicit more exclusively punitive reactions from parents, peers, and teachers, and dependent responses accordingly decrease.

The studies on the effects of reward and punishment clearly indicate that these factors are important in the expression of dependent response, and support Miller's

contention that the amount of punishment and reward for dependent response is important in predicting strength of dependent response. Punishment and reward must both be considered in order for predictive accuracy to be accomplished. The third part of his model, concerning the effects of generalization processes and generalization gradients is not as well supported in the literature. Studies of generalization of social response will now be reviewed.

Generalization of Dependent Response

Stimulus generalization involves the transfer of a response from the original stimulus situation to a new stimulus situation. Although generalization effects have been demonstrated in the laboratory, they have been more difficult to demonstrate outside of the laboratory. The studies in which generalization has been demonstrated have usually measured generalization rather quickly following training of response to the stimulus. When time and new learning events have intervened, the effects have been more elusive.

Rheingold (1956) found that the babies that she had consistently nurtured in an institution became more responsive to her as well as to others. Sears et al. (1953) were unable to discover a generalization gradient based on similarity in the relationship between current frustration

and dependency exhibited toward teachers and peers. There was, however, a somewhat higher association between dependency exhibited toward parents and teachers than there was between dependency expressed toward parents and peers.

Bandura (1963) found that the inhibited pre-adolescent boys, who tended to withdraw following parental punishment for dependency also tended to withdraw more often from peers, even though there was no reason to presume that peers had punished these dependency responses more frequently. Generalization of dependent response from parents to peers offered a credible explanation.

Other examples of generalization of social response have appeared in the studies of aggression. Walters and Brown (1963) found that aggressive responses trained to the Bobo doll (a large inflated plastic toy) generalized to other children in a competitive situation. Lovaas (1961) showed generalization from verbal to non-verbal aggression.

It seems quite significant, in light of their theoretical importance, that no studies are available relating generalization gradients, based on parental similarity to other objects, to levels of social response. Consequently, there is also no information available about what the underlying stimulus dimensions might be along which generalization gradients might occur.

Situational Determinants of Dependency

Effects of positive reward for dependency, effects of punishment, and generalization effects are theoretically distinct concepts. They have been open to operational definition and to measurement. Another less refined distinction may be used which is to some extent helpful. It overlaps to some extent with the concepts heretofore discussed, and is the concept of situational determinants of dependency. The situation might be described as the sum of the discriminative stimuli in the environment for a particular response, including the stimuli which signal that a response will be reinforced, those which signal non-reinforcement, and those which are irrelevant to reinforcement. Miller has theorized that the dimensions upon which parents are similar to others are relevant dimensions to expression of social response. Bandura and Walters have essentially asserted that such dimensions, if they exist, are irrelevant to dependent response. In this section, several studies will be summarized illustrating the powerful relevance of situational cues that are not based on similarities between parents and other objects, but rather which could be based on other relevant discriminations taught by parents, other objects of social response, and other agents of socialization.

Heathers (1953) tested children's reactions to walking a narrow plank blindfolded. He found that the

mothers of the children who behaved dependently (reached for a hand to support themselves) did not encourage them to depend upon self-skills as much as did the mothers of the independent children. The results suggested that the mothers differed in the degree to which they reinforced independent responses in certain situations.

Gewirtz (1954) found glances and attention-seeking to occur more frequently in a condition of low adult availability than in a high availability condition, a paradoxical finding. Stanislawski (1968) also found that expression of dependency was positively related to cues reflecting availability for help-seeking exhibited by the object.

A study by Diener (1967) demonstrated the strong predictive effectiveness of situational measures as opposed to personality measures of dependency. He measured the ability of overt dependency needs (a score based on sums of Edwards Personal Preference Scale subscores), covert dependency needs (TAT's scored for dependency), and knowledge of the dependency-eliciting elements of the experimenter's behavior to predict the number of requests for help, reassurance, and deferant comments when subjects were asked to solve a difficult puzzle. In the "dependent" condition, E played the role of a warm, considerate person who expressed willingness to help solve the puzzle. In the "independent" condition, E was neutral, and assisted when requested to do so. Diener found that the situation

accounted for virtually all of the predictable variance in dependent response. A point biserial correlation between the situation variable and the criterion measure was .73, while the multiple product moment correlation coefficient based on overt dependency needs, covert dependency needs, and the situation was .74.

Diener noted that future predictive research might focus more on the situational context in which behavior is to be expressed rather than on measures of assessment. Diener cited Rotter's (1955) thinking that the situation provides cues which are related through previous experience to expectancies for a given behavior being reinforced. Objective evaluation of individuals in situations, and the manipulation of known properties of these situations should lead to more accurate predictions than test data.

METHODS AND PROCEDURE

The Dependency Questionnaire (DQ), a Semantic Differential (SD), and Form A of the High School Personality Questionnaire (HSPQ), all to be described in a later section, were administered to two groups (N = 108 each) of eighth grade boys. One group of boys recompleted the SD and DQ after a two week interval in order to provide reliability data.

Subjects

The schools from which S's were selected will be denoted Cactus and Dinsmoor Jr. High Schools in order to mask their identities. The overall goal of subject selection was to recruit 108 eighth grade boys who were reading at or above the fifth grade level in each school. Due to the large numbers required, this resulted eventually in choosing 108 of the best readers in the schools. The reading measure used was the recent score on the Stanford Achievement Test (Reading). From the results of this test, school officials were able to select students reading at or above the 3rd stanine (eighth grade norms).

Although the selection criteria were similar, methods of enlisting cooperation differed. At Cactus, students were merely notified of their selection for the study. At

Dinsmoor, students were assembled, and their voluntary participation enlisted. The best readers were then selected from the volunteer lists. The selection procedure resulted in two groups of students, one of which was somewhat older, due to being tested two months later, and whose average reading values were poorer than the other. The mean and standard deviation of the ages at Dinsmoor were 13.79 years and .41 years, while at Cactus these values were 13.52 years and .50 years respectively. For reading stanines, the mean value for Dinsmoor students was 5.16 and the SD was 1.76. These values for Cactus were 6.14 and 1.92.

The schools were chosen on the basis of their availability for a research project and were not chosen to reflect extremes in socioeconomic or racial composition. They served predominantly middle class areas of the city.

Procedure and Instructions

Students met E in groups of 40-60 in an auditorium where the materials had been placed beforehand. He thanked the students for participating in "A study to find how students usually react in various situations, and their opinions and attitudes toward various people and things." (For the complete introductions, see Appendices A, B, and C.) E then began the testing session with the DQ (Appendix D) followed by the SD (Appendix E), and the Jr.-Sr. High School Personality Questionnaire (HSPQ). Instructions for the HSPQ

were read from the front of the test booklets provided. The HSPQ had also been taped, and students were able to use the booklet, listen to the tape, or both, as they wished.

The second session at Dinsmoor was essentially identical with the exception that the HSPQ was not administered. The introduction (Appendix C) explained that the purpose of repeating the questionnaires was to discover "the degree to which people tend to respond the same way the second time they fill out the questionnaires."

One student was uncooperative, however it was possible to replace his protocols with those of another student. Another student at Dinsmoor did not understand the instructions at first testing. In order to balance the design, his set of protocols from the second testing session replaced his protocols from the first. This procedure resulted in 107 students for the reliability study, and 108 in each group for the main study.

Instruments

The instruments used in this study included the Dependency Questionnaire (DQ) entitled "Reaction Questionnaire" for presentation to subjects, a Semantic Differential (SD), and the High School Personality Questionnaire (HSPQ). Copies of the DQ and SD may be found in Appendices D and E. The discussion to follow will deal with these measures in detail.

The Dependency Questionnaire (DQ)

The DQ was constructed in order to provide an instrument which would measure dependent response toward three different persons across three response-cuing conditions. It involved a translation of the social learning definitions of dependency from Bandura and Walters (1963) into a set of response choices. The definitions of dependency used were "a tendency to seek proximity, physical contact, help, reassurance, or approval [p. 127]," and "a class of responses capable of eliciting positive attending and ministering responses from others [p. 139]."

DQ Item Construction. The DQ consisted of essentially nine items, which combined the three objects (father, male teacher, and team-mate) with either positive, neutral, or negative cues for dependency. Four types-of-response were measured for each cue-object item. These were: seeking help or advice (help), talking with the object (talk), suggesting a mutual activity (s. activity), and feeling comfortable with the object (comfort). Responses to each of the four types-of-response (i.e., help) were made on a 5-point Likert scale.

The following is a typical item from the DQ (object: teacher; cue: negative):

One of my male teachers is sitting in the classroom after school. As I see him, he turns around and starts making preparations to leave. I would:

_____go in and ask his help on a particularly difficult lesson or personal problem.

_____go in and talk with him for a while.

_____go in and volunteer for a special project on which I know he will be working with just a few students.

_____feel comfortable with him.

The team-mate object was chosen because, like the male teacher, it would imply acquaintance without friendship. Instructions emphasized that the S was to visualize only one male teacher, one team-mate, and his own father (or a surrogate) as he completed the ratings, so to minimize shifts in persons during the ratings.

In the DQ the person-objects were nested within different situations. Father was described in the living room, teacher in a classroom, and team-mate on a bench at school. The effect of the person was thus confounded with the situation. Although there were disadvantages to this arrangement, separate specification of the situation for each object would allow the S to visualize the situation clearly, and therefore give him more information on which to predicate his response. Variability due to idiosyncratic interpretation would hopefully be reduced.

Forms of the DQ. Order effects were expected to occur and therefore nine forms of the DQ were constructed. A 9 x 9 latin square was chosen to arrange nine item orders such that each item would appear once in each serial order

position, and no item would be followed by another item from the same object class (i.e., father). An additional latin square balanced the response orders. The latin squares were:

A	B	C	D	E	F	G	H	I
1	2	3	4	5	6	7	8	9
5	6	4	8	9	7	2	3	1
9	7	8	3	1	2	6	4	5
8	9	7	2	3	1	5	6	4
3	1	2	6	4	5	9	7	8
4	5	6	7	8	9	1	2	3
6	4	5	9	7	8	3	1	2
7	8	9	1	2	3	4	5	6
2	3	1	5	6	4	8	9	7

and

1	2	3	4
A	D	C	B
B	C	A	D
C	B	D	A
D	A	B	C

The resulting nine forms, defined by their item type-of-response orders were: A-1, B-3, C-4, D-4, E-3, F-3, G-1, H-2, I-2. Response order three (CADB) was represented three times, while all other orders were represented twice.

Scoring of the DQ. The DQ protocols were scored for the 20 scores portrayed in Table 1. Father dependency was represented by "total father," peer dependency by "total peer," etc. Total dependency referred to the sum of father, teacher, and peer dependency. The help, talk, s. activity, and comfort totals were the sum of these scores over all object and cue conditions.

Table 1. Scoring Format for DQ Protocols

Cues	Type-of-Response	Objects			
		Father	Teacher	Peer	
Positive	Help	_____	_____	_____	Total Positive
	Talk	_____	_____	_____	
	S. Activity	_____	_____	_____	
	Comfort	_____	_____	_____	
		<u>Total</u>	<u>Total</u>	<u>Total</u>	_____
Neutral	Help	_____	_____	_____	Total Neutral
	Talk	_____	_____	_____	
	S. Activity	_____	_____	_____	
	Comfort	_____	_____	_____	
		<u>Total</u>	<u>Total</u>	<u>Total</u>	_____
Negative	Help	_____	_____	_____	Total Negative
	Talk	_____	_____	_____	
	S. Activity	_____	_____	_____	
	Comfort	_____	_____	_____	
		<u>Total</u>	<u>Total</u>	<u>Total</u>	_____
		<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>
		Father	Teacher	Peer	Dependency
Total Help_____		Total Talk_____		Total S. Act._____	
		Total Comfort_____			

Original Likert scores were used for deriving subscores, and this resulted in the somewhat misleading condition in which a high dependency score represented low probability of dependent response and vice versa.

The Issue of Validity. Since the DQ was a new instrument designed for research use, and as a vehicle for the variables of interest, its face validity should be discussed. As earlier noted, its types-of-response did correspond to the social learning definition of dependency. It would have been more rigorous to validate the DQ against teachers' ratings for example, however the limited objective of the DQ and the major auxiliary study involved precluded that approach. It is also apparent that even if behavioral ratings by teachers were made, the validity of their judgments would still be at issue. For these reasons it was decided to use the procedure outlined in the next section.

The Jr.-Sr. HSPQ

For the reasons discussed earlier, a test was sought which would provide an interpretive context for the DQ. A review of the available instruments revealed that there were none which (1) had separate scales of dependency as defined, (2) were supported by behavioral ratings, and (3) which were suitable for adolescents. The HSPQ (Institute for Personality and Ability Testing, 1963a), although it did not have

a specific dependency scale, was supported by behavioral ratings and was suitable for adolescents. Since the HSPQ scales were used to interpret the DQ, it will be discussed in more detail.

Background of the HSPQ. The HSPQ was the result of an extensive research program by Cattell and his colleagues using factor analytic techniques. It is available in four forms, each of which measures fourteen bipolar personality dimensions, or factors, through responses to 142 items. The items are in a three-choice format.

Cattell made a distinction between three methods of personality measurement. The first method used questionnaire (Q) data, behavior taken only as behavior. These included all self-report response data. The second method used the results of objective tests (O-data), which would include the responses of the subject in various objective and experimental situations. An example would be "good school grades." The third method involved the use of L-data. These were "life record data, covering behavior in situ instead of in a test and therefore including the specifically important behaviors of criteria. Often evaluated by behavior rating [Cattell, 1957, p. 895]."

In his original research, Cattell distilled 37 bipolar traits from the dictionary, and other sources. Ratings of these traits were factor analyzed, resulting in a set of

factors or dimensions which would measure the personality sphere. Questionnaires were developed to measure the factors and were further refined. The HSPQ was the result of extension of the original questionnaires to younger age-groups, an enterprise which is continuing. In these extensions, "marker variables" were inserted representing the factors to identify them in the younger age group.

Validity of the HSPQ. An important focus of Cattell's research program was to validate the questionnaire (Q) factors in life history (L) data. For this validation the subjects were rated by teachers, peers, or others on a set of 30-40 bipolar traits. These ratings were factor analyzed, and the resulting L-factors compared with corresponding Q-factors from the same subjects. The congruence between the two sets represented the validation and behavioral definitions of the Q-factors. The following quotation represents this relationship, and Cattell's judgment regarding it. The tables to which he referred are those showing behavioral correlates of the factors (see Appendix F).

The following tables, therefore, simply set out forms of real-life (criterion) behavior that have been shown in experiments and rating studies to be expressions of (statistically, to "load" significantly on) each factor. The correlations on which they are based represent the mean of three or more independent factor-analytic studies on adults (15, 107, 158), and children (15, 19) which used identically defined items for ratings

as set out more fully in the research reports (Institute for Personality and Ability Testing [IPAT], 1969, p. 27).

HSPQ Application to the Present Study. The HSPQ was administered to all participating students according to the instructions in the HSPQ Manual (Institute for Personality and Ability Testing, 1963b). In order to pace the students, and thereby eliminate some of the confusion due to students finishing early, the material was also presented on tape. Students were told that they could read the test booklet or listen to the tape.

The HSPQ records were scored for the fourteen factors, and the raw scores were used in the analysis.

The Semantic Differential

One of the two independent variables in this study was the objects of dependency. A significant objects effect, if it occurred would have indicated that boys emit dependent responses differentially toward fathers, male teachers, and team-mates. This would have been an important finding, however it would have been more illuminating to relate characteristics of these persons to such differential response. Since symbolic dependent responses were going to be elicited and the "objects" themselves were symbolic representations, it seemed important to scale the stimuli by methods appropriate for such symbolic materials. The Semantic Differential technique (SD) was chosen for object scaling because

of its applicability to verbal materials, the body of research literature concerned with its use and evaluation, and its ease of administration.

In the exposition to follow, the SD is discussed in detail. The first section will cover general issues in SD research, including its origins, theoretical basis, and methodological issues. The second section will discuss in detail the application of the SD to the present study, including the decisions made in adapting it to the study, and the statistics that were used.

Origins and Issues of the Semantic Differential.

The SD is a measurement technique whereby research in a content domain is conducted using the judgments that persons make on a set of bipolar adjectival scales. It is defined by the task for the subjects, its origins, theoretical accounts of what it measures, and its formal and statistical assumptions. These will each be discussed in detail.

The task for the subject is to rate a given set of concepts, for example BOULDER, ADLAI STEVENSON, on a set of bipolar adjectival scales, for example hard-soft, friendly-unfriendly, and fast-slow, according to what the concept means to him. There are seven possible choices, from very closely related, quite closely related, only slightly related, to neutral, equally associated, or completely irrelevant to one of the two poles. For scoring purposes

the choices are assigned values from -3 to +3. For some research purposes, a latency of response measure is also taken.

The SD technique originated in research on synesthesia, "a phenomenon characterizing the experiences of certain individuals, in which certain sensations belonging to one sense or mode attach to certain sensations of another group and appear regularly whenever a stimulus of the latter type occurs [Osgood, Suci, and Tannenbaum, 1957, p. 20]." An example might be that the synesthete would verbally describe a slow, melancholic musical selection as "heavy," "blue," and "dark." Various investigators found that this was not a rare or unique ability, but that college students were able to make these judgments and in some cases to reach high levels of agreement. Further research included factor analyses (defined later) of these judgments, development of the types of scales used in SD research, and the use of the SD scales in other content domains.

Osgood et al. (1957) entitled their first major exposition of SD technique The Measurement of Meaning, a title which, through its use of the term "meaning," led to a fair amount of discussion by linguists. Osgood, Suci, and Tannenbaum (1969, p. 72) distinguished between the denotative, designative, or referential meaning of signs (in lay terms, their definition), and the connotative, emotional, or

metaphorical meaning. The SD was introduced as a measure of connotative meaning, a "multivariate differentiation of concept meanings in terms of a limited number of semantic scales of known factor composition [Osgood and Suci, 1969, p. 42]."

Their construction of connotative meaning was as a mediating reaction occurring within the organism which was an intervening variable in the relationship between objects and their signs. The mediating reaction was

the mechanism that ties particular signs to particular stimulus-objects and not to others (p. 9). The proposition which relates signs to objects by means of the mediating reaction is: a pattern of stimulation which is not the object is a sign of the object if it evokes in an organism a mediating reaction, this (a) being some fractional part of the total behavior elicited by the object and (b) producing distinctive self-stimulation that mediates responses which would not occur without the previous association of non-object, and object patterns of stimulation (Osgood, 1969, pp. 9-10).

The following example provides a concrete illustration of the process and introduces symbols for the various components of the reaction.

Take for illustration the connotative meaning of the word SPIDER. The stimulus-object (\hat{S}), the visual pattern of hairy-legged insect body often encountered in a threat context provided by other humans, elicits a complex pattern of behavior (R_T), which in this case includes a heavy loading of autonomic "fear" activity. Portions of this total behavior to the spider-object become conditioned to the heard-word, SPIDER. With repetitions of the sign sequence, the mediation process becomes reduced to some minimally effortful and minimally interfering replica--but still includes those autonomic reactions which confer a threatening

significance upon this sign. This mediating reaction (r_m) produces a distinctive pattern of self-stimulation (s_m) which may elicit a variety of overt behaviors (R_x)--shivering and saying "ugh," running out of a room where a spider is said to be lurking, and even refusing a job in the South, which is said to abound in spiders (p. 10).

The representational mediation process ($r_m \rightarrow s_m$) was then the process of interest and the SD was a measure of r_m (the mediating reaction), as expressed in overt instrumental acts (R_x).

Although the SD was developed without concern for its formal status, Osgood and his colleagues later stated the assumptions needed in order to measure the mediating reaction. These measurement assumptions of the SD were:

1. The process of description can be conceived as the allocation of a concept to an experiential continuum definable by a pair of polar terms.
2. Many different experiential continua are essentially equivalent and may be represented on a single dimension. (This assumption was derived from the results of synesthesia research and has been supported by the generality of factor structure found across modalities, groups, and cultures).
3. A limited number of such continua can be used to define a semantic space within which the meaning of a concept can be specified (Osgood and Suci, 1969, p. 43).

These measurement assumptions, by their nature, led to the use of factor analysis as the measurement technique.

Factor analysis is

a means of seeking a minimal number of independent dimensions which will allow the description of a

body of data to a satisfactory degree of precision. The geometric model is that of an m-dimensional Euclidean hyperspace. The variables under study are regarded as vectors (directed lines of specified length starting at the origin) in this hyperspace, and the first object of the analysis is to specify the coordinates of the termini of the vectors, in some arbitrary reference frame, in such a way that the size of the angles between the vectors will be inversely related to the degree of their relationship or similarity (Carroll, 1969, pp. 101-104).

The coordinate frame of reference was then "rotated" to a position which would delineate the primary dimensions of the space. Each "concept" on the SD, then represented a point in space which related to each of the dimensions or "factors." The relationship between the scale and the factor was represented by the "loading" of the scale on the factor.

We have seen, then, that the SD is a technique rather than a specific device, which, through a set of adjectival ratings, measures the connotative meaning of concepts, and associated mediating reactions, by placing them in an m-dimensional hyperspace through the technique of factor analysis.

There was an extensive amount of research interest in the SD after the publication of The Measurement of Meaning (Osgood et al., 1957). Semantic Differential Technique (Snider and Osgood, 1969) and an excellent review article by Heise (1969) provided access to the literature. The SD was applied to problems in verbal learning,

political behavior, psychotherapy, and linguistics. Again and again, the basic dimensions or factors were replicated, with certain variations depending upon the content and the group studied. These factors were termed the evaluative, the potency, and the activity factors (EPA). Scales such as good-bad, beautiful-ugly, nice-awful, clean-dirty, and pleasant-unpleasant showed high loadings on the evaluative factor. Strong-weak, large-small, and heavy-light were examples of scales with high loadings on the potency factor, while sharp-dull, fast-slow, and active-passive were examples of scales loaded on the activity factor.

Rather than review the literature on these factors, reference is made to such a review by Heise (1969) and his conclusion regarding their generality.

Factor analyses of SD data consistently show that there are three major dimensions of rating response --Evaluation, Activity, and Potency. Studies dealing with a great variety of scales, stimuli, and subjects have demonstrated the prominence and significance of the EPA structure in SD data (p. 412).

An experimenter planning to use the SD in his research should be aware of certain methodological considerations. Three metric assumptions were involved in the SD technique (Heise, 1969). The first was the bipolarity assumption, that the end-points of the dimensions were at about opposite points in the semantic space and that lines connecting them passed through the origin. A second assumption was that the seven points on each scale were at

approximately equal intervals. A Third assumption was that the zero points of the SD scales were at "true" zero.

Heise (1969) evaluated these assumptions and concluded that

While a few studies are available concerning the metric of SD scales, this area has remained one of the least studied in SD methodology. The information available suggests that the basic metric assumptions for the SD are not quite accurate, but also that violations of the assumptions are not serious enough to interfere with many present applications of the SD. Furthermore, some metric errors would be expected to counteract one another when ratings on several different scales are added together to form factor scores (pp. 407-408).

Two other important methodological issues, one of which has implications for this study, should be mentioned: biased errors introduced by social desirability, and the effect of concept-scale interactions. Here we will deviate somewhat from the general format and deal with their implications for the present study.

One variable which was influential in ratings involving the evaluative factor was social desirability, the differential tendency of individuals or groups to respond to questionnaires or other stimulus situations in a socially desirable manner. Ford and Meisels (1965), in a set of studies, asked their subjects to judge the social desirability of a set of SD scales (by estimating how favorable the traits would be if applied to a person of our own culture). These values were correlated with the loadings of the scales on the EPA factors, and a very high

correspondence was noted for scales loaded on the evaluative factor, while the activity and potency factors were generally uncorrelated with social desirability. Ford and Meisels reported that this effect would be most prominent when concepts such as MY SELF, ME, or MY IDEAL SELF were rated, but could also influence judgments of other people.

This effect has not been systematically replicated for other concepts, in other studies, and has usually not been taken into account in SD studies. For purposes of this study, father may have been more positively evaluated because it was desirable to make "good" judgments of him, but, without further information, it was difficult to see how team-mate and teacher would be differentially influenced. If social desirability was an effect however, since it was positively correlated with the evaluative dimension, it would have complemented that factor.

Concept-scale interaction was another factor entering into the interpretation of SD results (Heise, 1969). When a single concept, or class of concepts was analyzed, at times standard scales did not have their usual alignment in the EPA structure. An example was where the scales pleasurable-unpleasurable and masculine-feminine (evaluative scales) would correlate positively when the concept ADLAI STEVENSON was rated, but negatively when MY MOTHER was rated.

There are many possible reasons for concept-scale interaction to occur, and for precise measurement its existence would have required a complete factoring of the data for the study. Choice of concepts, various biased rating errors, changes in relevance of the scales for particular concepts, and shifts between denotative and connotative usage of the scales all could have exerted an influence. Heise (1969) judged that use of the SD is valid without revalidation for each stimulus, but that the loss of precision in doing so should be recognized.

The existence or possible existence of concept-scale interaction, whether it is a function of relevance or stimulus environment, means that an SD ideally should be validated and adjusted for every new stimulus class with which it is used. A generalized SD, using standard scales like good-bad, powerful-powerless, and fast-slow, certainly is useful for rough and ready measurements, but more precise measurements will be attained only by tailoring instruments to each content domain so as to control for true concept-scale interactions (p. 416).

For the present study, it was feasible to take concept-scale interaction into account to some extent. The concepts used were common person objects (teacher and father particularly). Use of factor scores obtained by summing four scales balanced the effect to some extent. The effect was modified by using scales that were relevant to the concept and in which the connotative-denotative ambiguity did not seem apparent to a great extent. A critical factor did remain, however, where concept-scale interaction could

have arisen. Scales may have been used differently when a specific person, instead of a class of persons, was rated. The effect of concept-scale interaction therefore limited the possible generalization of results. A more limited but valid conclusion was possible, that the subjects did differ as to their scale ratings of these objects, but that whether or not the dimensions measured were exactly the same as EPA in other studies needed to remain tentative.

Due to the other variables of interest in this study, and limited availability of subject time (a suitable control would have involved inclusion of many more concepts--a representative sample of the semantic space), generalization of results was sacrificed.

Use of the SD in This Study. A measure was needed to measure stimulus aspects of the objects rated, and the SD was chosen for that purpose. The stimulus similarity of male teacher and team-mate to father was measured, in terms of absolute distance in semantic space along the evaluative, activity, and potency dimensions. Stimulus similarity was then compared with similarities in dependent expression. In this section the decisions made in applying SD technique to the problem will be stated, beginning with differences between the format used here and standard format, continuing through the scales selected, and

concluding with scoring and statistics. The complete SD comprises Appendix E.

Carroll (1969), in his critical review of The Measurement of Meaning (Osgood et al., 1957), pointed out that Osgood and his colleagues failed to specify the referents for semantic judgments. Carroll asked whether the subjects were to rate the concept as a general class, or to rate a specific instance or example of the class. In the present study, the objects were specified and the subjects asked to rate their chosen member of the classes father, teacher, and team-mate. In contrast, in typical SD research, persons have been introduced as "concepts" in a context of other personal and impersonal concepts. In this study the context for comparison was other people, in order to avoid the problem of the subject comparing his father to other fathers, for example, and staying closer to the general "meaning" of his father.

The focus of the present research design was to discover correlates of dependent response in semantic dimensions as attributes of persons. In order for semantic differences to be meaningful, they would have to have different response implications. SD theory did suggest such implications as noted in the following quotation:

If evaluation, activity, and potency are such pervasive components of adjectival characterization, they must correspond to fundamental psychological attributes of persons and the organization of perceptual and conceptual

processes. To indulge in some bold speculation perhaps carrying forward the analysis offered by the authors themselves (25-30), let us propose that the three principal SD dimensions represent fundamental dimensions in the adjustment of the individual to the objects in his environment. The first dimension, evaluation, corresponds to the individual's tendency to make an approach to the stimulus or to avoid it; it measures the extent to which the stimulus has positively or negatively reinforced the individual's responses. . . . The second dimension, activity, refers to the necessity or nonnecessity of making movements in adjusting to stimuli. . . . Finally, the third dimension, potency, suggests a measurement of the amount of adjustment that is made or must be made to a stimulus, or perhaps the amount of effort which is put into the response to a stimulus (Carroll, 1969, pp. 111-112).

There was a firm implication that the SD dimensions could represent fundamental response orientations to the stimulus.

This point was further implicit in Osgood's theory of the mediation process.

Whereas Morris linked sign and object through partial identity of object-produced and disposition-produced behaviors, we have linked sign and object through partial identity of the "disposition" itself with the behavior elicited by the object. Words represent things because they produce some replica of the actual behavior toward these things, as a mediation process (Osgood, 1969, p. 14).

From this statement it also followed that one would expect two signs to be related in "meaning" to the extent that they would share common response tendencies.

Although persons have been commonly rated on the SD, there have been few studies in which subjects have rated specific persons known to them. One such study was

conducted, however, by Burke and Bennis (1961). They administered a set of scales drawn from Osgood's EPA dimensions, Schutz's group dimensions, and Carter's group factors, a total of 19 scales. Each member of the T-group was asked to rate the names of the other members, as well as himself and his ideal self "on the basis of what these things mean to you . . . [giving your] immediate feelings about the items." A Hotelling principal axis factor analysis revealed three factors accounting for 86% of the total variance. Burke and Bennis identified these factors as: a friendliness-evaluation factor, a dominance-potency factor, and a participation-activity factor. It thus appears likely that even when specific persons are the concepts rated on the SD, the basic EPA factor structure is replicated. "What is more, the general dimensions of meaning, as found by Osgood in a variety of individual settings (Osgood, 1957), correspond quite closely to the ways in which group members are perceived in the group [Burke and Bennis, 1961, p. 177]."

In choosing the scales to be used in this study, scales were chosen for which there were normative data on children, and which generally conformed to selection criteria presented by Osgood (Osgood et al., 1957, pp. 78-80). Scales were accordingly selected which had high loadings on one factor and low loadings on the others, and which were relevant to person concepts.

The specific scales used in this study were chosen from a larger number used by DiVesta (DiVesta, 1966; DiVesta and Dick, 1966) in studies of the semantic structures of children. Four scales from each of the EPA dimensions were used, in order to combine them into more stable factor scores. In order to use the D-score (discussed later), an equal number of scales were used to represent each factor. The scales used with their factor loadings for a group of seventh-graders were:

<u>Evaluation</u>	<u>Factor loading</u>
% total variance 24.24	
good-bad	.93
friendly-unfriendly	.93
right-wrong	.91
funny-sad	.80

<u>Potency</u>	
% total variance 10.41	
little-big	.83
light-heavy	.65
weak-strong	.59
short-long	.72

<u>Activity</u>	
% total variance 10.80	
quiet-loud	.73
slow-fast	.79
still-moving	.78
dull-sharp	.55

The above factor loadings were obtained from data from seventh grade students, an age when stable EPA

structure emerges in semantic judgments (DiVesta, 1966; DiVesta and Dick, 1966). Immediate retest reliabilities for concepts were: evaluation .94, potency .84, and activity .73. For individuals, the immediate retest reliabilities were: evaluation .84, potency .72, and activity .69, while the reliabilities after four weeks were: evaluation .78, potency .55, and activity .54.

The instructions for the SD were taken in modified form from The Measurement of Meaning (Osgood et al., 1957, pp. 84-86). The instructions were modified in that they requested the subjects to rate the "person" rather than the "concept" and specified that a particular person was to be rated (see Appendix E).

The format was the second of Osgood's graphic formats (p. 81), in which the subject rated each person on all scales before rating the next person. This presentation is less difficult for the subject, is preferred over others, allows for greater stability of ratings, and is statistically equivalent to complete randomization.

For this study the order of scales was rotated so that scales from different factors were presented consecutively. The polarity was reversed for each presentation of a scale in order to balance for right-left response preferences.

The scores used for statistical analysis were factor scores derived by summing the raw scale scores for the four

scales comprising each of the factors. A 1-7 point scoring key was used, so that a factor score of four would indicate low evaluation, for example, and a score of 28 would indicate maximum evaluation. The factor scores were used in the analyses. For estimating the absolute distance in semantic space, however, D was used. The formula for D is the generalized distance formula from solid geometry. It is $D_{il} = \sqrt{\sum_j d_{il}^2}$ where D_{il} is the linear distance in semantic space representing concepts i and l and d_{il} is the algebraic difference between the coordinates of i and l on the same dimension or factor j. Summation is over k dimensions (Osgood et al., 1957, p. 90). D is a better expression of the relationships in SD data, and is a better index of profile similarity than is the product-moment correlation coefficient (r), because D takes into account both the profile covariation and the discrepancies between the means of the profiles. While r is an expression of profile covariation, it is not sensitive to differences between the means. Therefore it is not sensitive to similarities and differences between concepts in certain cases (Osgood et al., 1957, p. 90). Non-parametric statistics should be used to evaluate D-differences because:

The distribution of D is not known. It is probably not normal in shape, and if not, normal curve statistics are not applicable. In the group situation a number of non-parametric tests can be applied. If, for example, the hypothesis states that the distance between concepts A and B will be greater than that between concepts A

and C for a particular group, the "sign test" or "Wilcoxon's matched-pairs signed-ranks test" may be used--i.e., we simply treat each subject's D_{AB} and D_{AC} as ordinary scores and see if the AB and AC values could have been samples from the same population (Osgood et al., 1957, p. 91).

RESULTS

Results will be presented in a sequence beginning with the test-retest reliabilities of the DQ and SD. Data will be presented on the variations in dependent response over forms, followed by the HSPQ validity of the DQ. Analyses of the cues and objects effects will be followed by derivations of appropriate similarity hypotheses from the DQ results, and their tests in the SD data. Finally, relationships between object dependency and SD ratings of the objects on the evaluative, potency, and activity dimensions will be reported.

Reliability

Pearson product-moment correlation coefficients (r) were used to estimate DQ and SD test-retest reliabilities from the Dinsmoor data. Reliability was highest for DQ father dependency ($r = .80$), intermediate for peer dependency ($r = .75$), and lowest for teacher dependency ($r = .69$). Corresponding values for the positive, neutral, and negative cues were .76, .69, and .72 respectively. DQ total dependency test-retest reliability was .79. DQ reliability compared favorably with SD reliability. The SD reliabilities for total evaluation, potency, and activity were .69, .69, and .52 respectively.

Forms Effects

The forms effects were tested for each school separately by a four-way analysis of variance, in which the main effects were objects, cues, subjects, and forms. Since these results overlapped with the major analyses presented later, only the main forms effect and its interactions are presented in Tables 2 and 3. The only significant effect noted in these analyses was an Objects x Forms interaction in the Dinsmoor group ($p < .05$). The graph of the appropriate mean values (Figure 1) illustrates that noticeable differences in slope occurred mainly in the peer ratings. A major reversal occurred between forms G1 and H2. Small slope differences also occurred between forms A1 and G1, and H2 and I2. Small differences in slope between ratings of all three objects occurred between forms F3, C4, and D4. It is, however, highly probable from this figure, that the G1 to H2 reversal accounted for the significant interaction effect. Since the effect occurred between item orders rather than between type-of-response orders, it was probably due to item sequence differences rather than to type-of-response sequence differences.

Planned orthogonal comparisons of the form means, choosing various planned combinations of item and type-of-response orders were done, and none were significant. It was impossible to strictly compare item vs. type-of-response orders however, due to confounding. The differences in

Table 2. Analysis of Variance: Forms (Cactus)

Source	df	MS	F
Forms (F)	8	29.89	.96
Objects (O) x F	16	16.59	1.73*
Cues (C) x F	16	3.07	.71
Subjects (S) x F	88	30.96	
O x S x F	176	9.57	
C x S x F	176	4.34	

Note--To avoid duplication, only main effect and interactions with Forms are shown. See Table 7 for other main effects and interactions.

*p < .05.

Table 3. Analysis of Variance: Forms (Dinsmoor)

Source	df	MS	F
Forms (F)	8	40.72	1.17
Objects (O) x F	16	15.34	1.51
Cues (C) x F	16	5.40	1.23
Subjects (S) x F	88	34.69	
O x S x F	176	10.12	
C x S x F	176	4.38	

Note--To avoid duplication, only main effect and interactions with Forms are shown. See Table 8 for other main effects and interactions. F values are non-significant.

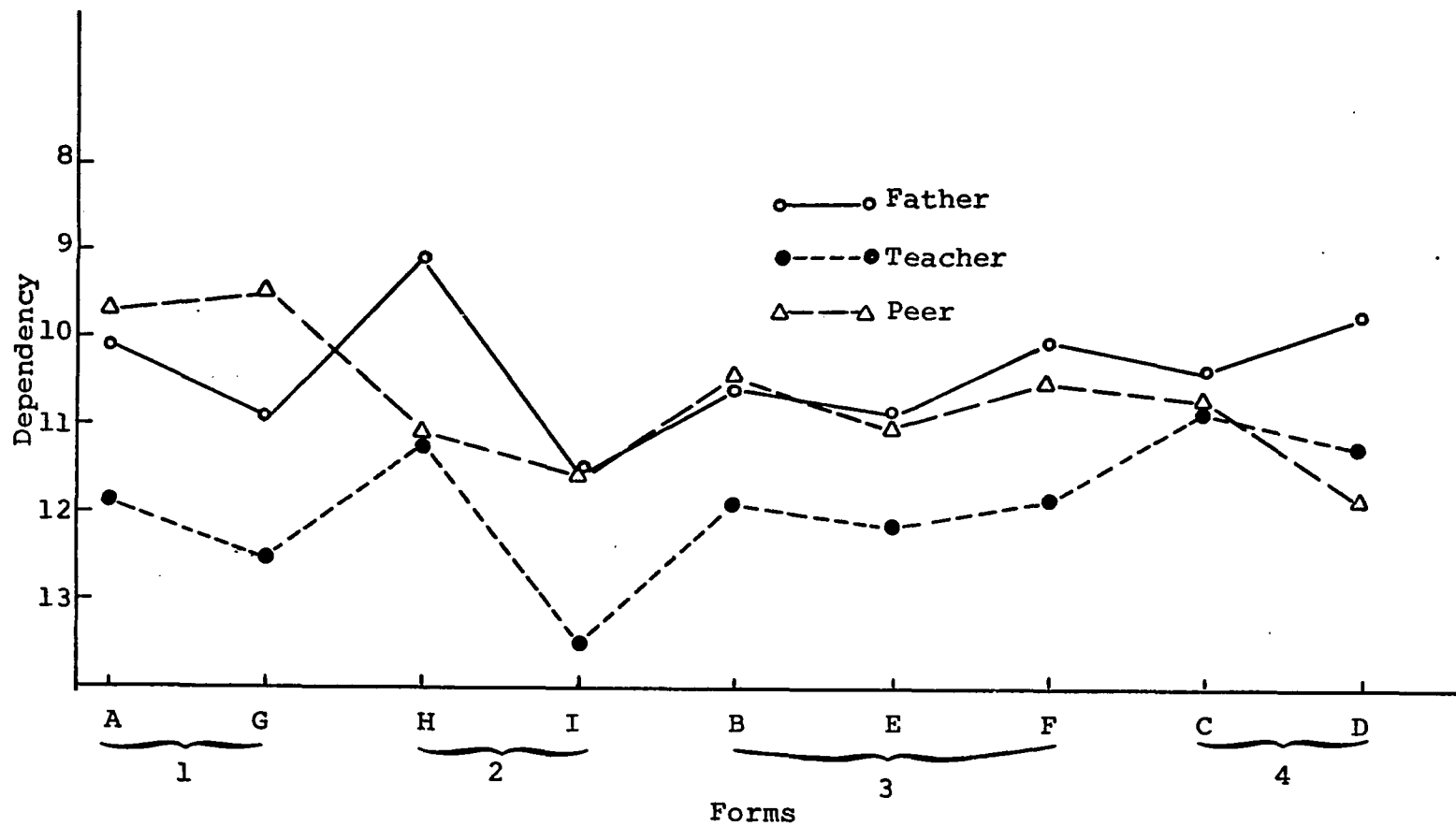


Figure 1. Objects x Forms Interaction (Cactus) -- Letters denote item order, numbers denote type-of-response order.

father and teacher dependency between forms H2 and I2, two forms sharing identical type-of-response orders, again suggested that there was a slight item sequence effect as opposed to one of type-of-response sequence.

DQ Validity

Table 4 shows the correlations of the fourteen HSPQ factors with father, teacher, peer, and total dependency. Here, abbreviated phrases will be used to describe the HSPQ factors, since the complete factor descriptions are available in Appendix F.

For the Cactus group, father dependency was significantly correlated with ego strength (C+, $r = .19$), tendermindedness (I+, $r = .20$), and group dependency (Q_2- , $r = .19$). Teacher dependency was correlated with zestfulness (J-, $r = .19$) and also with group dependency (Q_2- , $r = .23$). Peer dependency was correlated with enthusiasm (F+, $r = .20$). Total dependency was correlated with ego strength (C+, $r = .22$), and group dependency (Q_2- , $r = .23$).

No significant correlations were noted in the Dinsmoor group between the HSPQ factors and either father or teacher dependency. Peer dependency correlated with ego weakness (C-, $r = .23$), excitability (D+, $r = .28$), and guilt-proneness (O+, $r = .20$). Total dependency correlated with excitability (D+, $r = .21$).

Table 4. HSPQ Correlations with DQ Subscale and Total Scores

HSPQ Scales	Schools											
	Cactus (C)				Dinsmoor (D)				C and D Combined			
	F	T	P	Tot	F	T	P	Tot	F	T	P	Tot
A	-.01	.11	.12	.09	.04	.08	-.02	.05	.01	.08	.04	.06
B	.17	.02	.08	.12	-.01	.03	-.03	.02	.09	.06	.05	.10
C	.19*	.15	.17	.22*	.00	-.14	-.23*	-.13	.08	-.02	-.06	.02
D	.00	-.01	-.05	-.02	.12	.12	.28**	.21*	.07	.08	.13	.12
E	-.14	-.12	.10	-.08	-.04	-.09	.00	-.03	-.09	-.10	.05	-.05
F	.00	.02	.20*	.08	.14	.17	.06	.18	.07	.10	.14*	.13
G	.13	.14	.16	.18	.09	.15	-.11	.06	.12	.15*	.03	.13
H	.12	.10	.18	.18	.15	.07	.01	.12	.13	.08	.09	.14*
I	.20*	.08	.09	.16	.11	.09	.03	.08	.15*	.07	.05	.11
J	-.04	-.19*	-.10	-.14	.06	.15	.13	.13	.01	-.03	.01	-.01
O	-.07	-.15	-.06	-.13	.01	-.03	.20*	.07	-.02	-.06	.10	.00
Q ₂	-.19*	-.23*	-.11	-.23*	-.02	.05	.08	.01	-.11	-.11	-.02	-.12
Q ₃	.17	.11	-.02	.12	.00	.16	.04	.08	.07	.12	.00	.09
Q ₄	-.10	-.05	-.01	-.08	-.14	-.03	.07	-.07	-.11	-.02	.05	-.05

Note--"Tot" refers to total dependency score over Father (F), Teacher (T), and Peer (P). The signs of the original correlations are reversed for purposes of clarity.

*p < .05.

**p < .01.

When both groups were combined, father dependency was significantly correlated with tendermindedness (I+, $r = .15$), and teacher dependency correlated with superego strength (G+, $r = .15$). Peer dependency correlated with enthusiasm (F+, $r = .14$), and total dependency correlated with social boldness (H+, $r = .14$).

The patterns of intercorrelation between the HSPQ and DQ measures add complexity to the question of the validity of the DQ. Significant correlations in the Cactus data were not replicated in the Dinsmoor data. Indeed there were some striking reversals, particularly regarding the ego strength factor (C+). Total dependency was significantly correlated with ego strength ($r = .22$) at Cactus, but with its opposite, ego weakness ($r = .13$, non-significant) at Dinsmoor. At Cactus, teacher dependency was correlated with zestfulness (J-, $r = .19$), while at Dinsmoor, teacher dependency was correlated with the opposite of zestfulness, circumspect individualism (J+, $r = .15$, non-significant).

In the face of these results, the validity of the DQ is in question, because consistent correlations, across schools, and across objects were not obtained. Either the DQ was valid, or it was invalid. If it was invalid, then either the correlations were significant due to chance, or the DQ was measuring something other than dependency. If the DQ was valid, then the lack of consistency was due to differences between the Cactus and Dinsmoor groups. These

differences would be seen in the DQ measure, the HSPQ factors, and in the interaction between the DQ and the HSPQ measures.

Considering the case where the number of significant correlations would have been merely due to chance, sixteen of the 168 correlations of Table 4 were significant at beyond the .05 level. If all of the correlations were independent, this would be a significant number above expectancy ($\underline{z} = 2.52, p < .05$), however some groups of correlations were derived from the same sets of scores, and therefore were non-independent. The alternative of significance due to chance alone cannot therefore be rejected. The correlations upon which the validity of the DQ is based, therefore, must be interpreted quite tentatively.

If the DQ were measuring something other than dependency, then one would expect the DQ to have as many significant correlations with factors consistent with the definition of dependency as not. Table 4 indicates, leaving out the correlations with ego strength (C+), superego strength (G+), and circumspect individualism (O+), that eleven out of the sixteen correlations were directionally consistent with dependency. These were the correlations with D+ (excitability), F+ (enthusiasm), H+ (social boldness), I+ (tender-mindedness), J- (zestfulness), and Q₂- (group dependency). The directions of the significant correlations with the DQ measure therefore do indicate that the DQ measured

dependency as defined. If the DQ was valid, then the lack of correspondence in the DQ correlations between the two groups could have been due to DQ and/or HSPQ differences between the two groups. This possibility was tested by comparing the mean differences between the two groups for HSPQ and DQ factors by the t -test. Significant differences were found for both sets of factors. The Cactus group scored higher than the Dinsmoor group on intelligence (B+, $t = 2.57$, $p < .05$) and on guilt proneness (O+, $t = 2.15$, $p < .05$). The Cactus group scored lower than the Dinsmoor group on ego strength (C+, $t = 2.15$, $p < .05$). The Cactus group reported more teacher dependency ($t = 3.01$, $p < .01$) and total dependency ($t = 2.49$, $p < .05$) than did the Dinsmoor group. No other differences were significant.

The obtained Cactus-Dinsmoor differences in mean DQ and HSPQ scores do support the interpretation that the lack of correspondence in correlation patterns could have been due to real differences between the two populations in the DQ and HSPQ factors and in their interaction.

Although the conclusion must be only tentatively offered, the combined results of the validity analyses suggest that the DQ is a valid estimator of dependency, and that it is sensitive to group differences. The interpretation is also offered that the underlying personality correlates of dependent expression differ across objects. For father dependency, the tendermindedness of factor I+ is

important, while for teacher dependency, superego strength (G+) is more important. Peer dependency is related to the activity and enthusiasm of factor F+.

In conclusion, the DQ did show certain significant correlations with HSPQ scales, consistent in direction with dependency as here defined. The variability of the correlations across school groups, and across objects, as well as the rather low number of significant correlations relative to the number that would be expected due to chance alone, however, indicated that the DQ should not be considered a precise measure of a general trait with either great predictive efficiency or general applicability. The patterns of DQ correlations with the HSPQ scales in the two groups also suggested that the personality correlates of dependency differ according to the person toward whom the dependency is expressed and according to the school situation in which it is expressed.

Dependency Questionnaire Results

The cues and objects effects were tested by a three-way analysis of variance design (McNemar, 1955, pp. 318-399) in which the cues and objects variables were considered fixed, and the subjects variable random. It was a repeated measures, subjects by treatments design, mixed model, yielding cue and object main effects and an Object x Cue interaction. The sums of the four types-of-response (help,

talk, s. activity, and comfort) for the nine combinations of father, teacher, and peer objects x positive, neutral, and negative cues were used. The flexible analysis of variance computer program ANOVA 45 (Weldon and Humphrey, 1969) was used to analyze the data for Cactus and Dinsmoor subjects separately. Post-hoc comparisons of the means for the main effects were made by the Scheffé method (Hayes, 1963, pp. 483-489).

Cue and Object Effects

The analysis of variance results are summarized for the Cactus group in Table 5, and for the Dinsmoor group in Table 6. The main effects were identical for both groups. The objects effect was significant in both groups ($p < .01$; $p < .001$), and the cues effect was also significant ($p < .01$). While the $O \times C$ interaction was significant in the Cactus group ($p < .01$), it was not in the Dinsmoor group.

Table 7 shows the object and cue means for both groups. The objects were ordered father (high dependency)-peer-teacher for both groups. The cues were ordered positive (high dependency)-neutral-negative. Post-hoc comparisons of the means revealed the objects effect to be due to the father-teacher ($p < .01$) and the peer-teacher ($p < .05$) differences. The father-peer differences were not significant. The objects effect was due to the

Table 5. Analysis of Variance: Dependency Data (Cactus)

Source	df	MS	F
Objects (O)	2	195.10	19.43*
Cues (C)	2	596.80	149.20**
Subjects (S)	107	29.44	
O x C	4	17.04	5.24*
O x S	214	10.04	
C x S	214	4.38	
O x C x S	428	3.25	
Total	971		

*p < .01.

**p < .001.

Table 6. Analysis of Variance: Dependency Data (Dinsmoor)

Source	df	MS	F
Objects (O)	2	335.02	32.65*
Cues (C)	2	534.93	209.62*
Subjects (S)	107	33.65	
O x C	4	4.84	1.36
O x S	214	10.26	
C x S	214	4.46	
O x C x S	428	3.55	
Total	971		

*p < .001.

Table 7. Mean Dependency Scores

Variables	Schools			
	Cactus		Dinsmoor	
Objects	Father	10.39	Father	10.83
	Teacher	11.87	Teacher	12.78
	Peer	10.72	Peer	11.32
Cues	Positive	9.43	Positive	10.16
	Neutral	11.72	Neutral	12.30
	Negative	11.83	Negative	12.47

positive-neutral and the positive-negative differences ($p < .01$). The neutral-negative differences were not significant.

The graph of the significant $O \times C$ interaction in the Cactus group (Figure 2) shows that the effect occurred in peer dependency between the neutral and negative cues. More peer dependent responses were reported to negative than to neutral cues. An examination of the items involved explains both the $O \times C$ interaction and the result that the neutral-negative differences were not significant.

It was initially expected that a person who was reading or working would elicit more dependency than one who turned away or prepared to leave when the subject approached. This contrast is seen, for example, in the neutral and negative cues for peer. "As I see him, he is reading a book" (neutral). "As I see him he starts getting ready to leave" (negative).

The results imply, however, that a peer who is getting ready to leave is really more available than one who is engaged in another activity, i.e., reading or working. Why did the effect not occur, therefore for the father and teacher objects? The negative cue for father involved turning to watch television, another ongoing activity. The negative cue for teacher involved preparations to leave, perhaps to go home, which also could be construed as at least preparing to engage in another compelling activity. Thus the significant $O \times C$ interaction

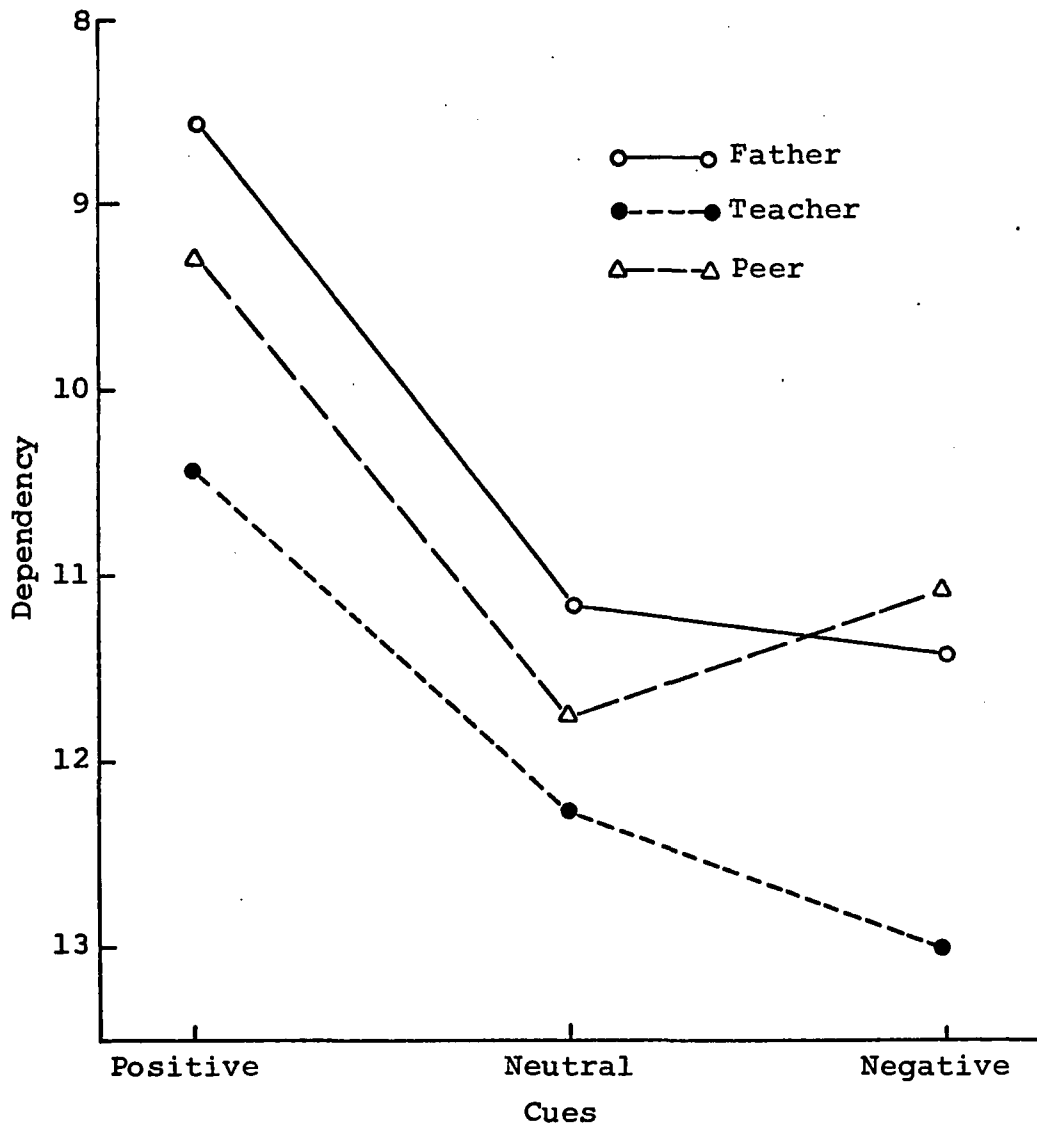


Figure 2. Objects x Cues Interaction (Cactus)

and the non-significance of the neutral-negative difference are explained by examination of the items involved.

The overall results of the analyses of variance demonstrated the powerful influence of very subtle cue differences and the refined demands of the situation. These influences were seen in the O x C interaction and in the explanation for the non-significant neutral-negative differences. Their power was further seen in the object and cue F values. The F values for objects were 19.43 and 32.65 while the F values for cues were 149.20 and 209.62, over six times greater.

Derivation of Hypotheses from DQ Results for Testing in SD Data

In this and the following sections, the similarity hypothesis will be evaluated. That hypothesis was:

A significant portion of the variance in dependent expression is accounted for by differences between parents, peers, and teachers. The amount of dependency shown, in seeking help or advice, talking with, suggesting a mutual activity, and feelings of being comfortable with the object is significantly correlated with either perceived evaluation, activity, or potency of the object as measured by the Semantic Differential (SD).

The first statement of the similarity hypothesis has been partially confirmed. The father-teacher and peer-teacher differences did account for a significant portion of the variance in dependency judgments. Significant father-peer differences did not, however, occur.

Since father and peer were more probable objects of dependency than was teacher, the relative distances between the objects in semantic space could be predicted. The distance between father and teacher would be greater than the distance between father and peer, and the distance between peer and teacher would be greater than the distance between father and peer. In inequality notation, the hypotheses would be: $FT-FP > 0$ and $FP-TP < 0$. The D value (discussed in connection with the SD, Methods and Procedures section) would express the appropriate distances.

Results

Table 8 shows the results of the Wilcoxon tests of these hypotheses (Siegel, 1956, pp. 75-83). In that table, the \underline{z} values are shown under the respective hypotheses with the sign of the mean difference replacing the sign of \underline{z} , for three SD dimensions (E,P,A), and two dimensions (E,A).

When the three SD dimensions were used, results were as hypothesized in only two out of six cases. When potency was deleted, the directions were as hypothesized in all six cases. In no case, however, did any difference reach significance. Strictly speaking, the similarity hypothesis was not confirmed in these data.

Further Hypotheses

As a further test of the similarity hypothesis, the subjects were divided into father dependent (FP) and peer

Table 8. Wilcoxon Matched-Pairs Signed-Ranks Tests of SD Hypotheses Derived from DQ Results

Schools	Hypotheses	
	FT-FP > 0	FP-TP < 0
	<u>Three Dimensions (E, P, A)</u>	
Cactus	-.79	-.41
Dinsmoor	-.10	.34
C-D Combined	-.57	-.12
	<u>Two Dimensions (E, A)</u>	
Cactus	.25	-.51
Dinsmoor	.48	-.51
C-D Combined	.55	-.71

Note--Values are z-scores with direction of difference preceding them. Direction of difference = sign z x sign T. $p > .05$ for all z values.

dependent (PF) groups on the basis of their father dependency and peer dependency scores. FP subjects were defined as those with lower father dependency scores (high father dependency) than peer dependency scores. PF subjects were defined as those with that order reversed. Subjects with tied scores were eliminated. Essentially this division artificially magnified the father-peer dependency difference. The hypotheses then became different for the FP and PF groups. For the FP group, the hypotheses were: $FT-FP > 0$, and $FT-TP > 0$. For the PF group they were: $FP-TP < 0$ and $FT-TP < 0$.

Results

The results of the Wilcoxon tests of the hypotheses are shown in Table 9. For the three dimensional case the hypotheses were confirmed as to directions of the differences in only four out of the eight cases. When two dimensions were used, the hypotheses were confirmed as to directions of the differences in seven out of the eight cases. The magnitudes of the differences did not achieve statistical significance. Therefore, although the directions of the differences which occurred tended to support the similarity hypothesis, they were of insufficient magnitude to support it.

Table 9. Wilcoxon Matched-Pairs Signed-Ranks Tests of SD Hypotheses Derived from DQ Results for Father-Dependent (FP) and Peer-Dependent (PF) Subjects

School	Hypotheses			
	FP		PF	
	FT-FP > 0	FT-TP > 0	FP-TP < 0	FT-TP < 0
	<u>Three Dimensions (E,P,A)</u>			
Cactus	-.43	-1.02	-.59	-.18
Dinsmoor	.17	.11	.05	.50
	<u>Two Dimensions (E,A)</u>			
Cactus	.39	.71	-.69	-.74
Dinsmoor	.50	.17	-.45	.16

Note--Values are z-scores preceded by sign of difference. Sign of difference = sign T x sign z. $p > .05$ for all z values.

Comparison of SD Ratings with Object Dependency

The D-score results suggested that the SD dimensions were differently related to object dependency. The objects could have been differently ordered along the SD dimensions, and the individual SD dimensions could have been correlated more or less highly with dependent response to different objects. When the SD dimensions were combined, essential relationships were obscured. The purpose of this section is to present the results of t-test and correlational comparisons in order to clarify these relationships.

Correlational Results

Table 10 shows the coefficients of determination (r^2) and multiple determination (R^2) reflecting the percentage of variance in dependency scores which was accounted for by the SD dimensions individually, in pairwise combinations, and by the combination of all three SD dimensions. Evaluation accounted for the greatest amount of the variance in dependency, across objects and schools. In most cases it was the single best predictor of dependent response. The contributions of the activity and potency dimensions varied according to the objects rated and the schools in which they were measured. Activity was generally superior to potency in predicting dependency. Predictive efficiency was gained in certain cases by the combination of evaluation and

Table 10. Coefficients of Determination and Multiple Determination for SD E, P, A Factors as Predictors of Dependent Response (D)

	Individual and Combined SD Predictors						
	r_{DE}^2	r_{DP}^2	r_{DA}^2	$R_{D \cdot EA}^2$	$R_{D \cdot EP}^2$	$R_{D \cdot PA}^2$	$R_{D \cdot EPA}^2$
	<u>Father</u>						
Cactus	.18	.02	.07	.18	.18	.07	.18
Dinsmoor	.15	.10	.06	.17	.20	.13	.21
C-D	.17	.05	.06	.18	.18	.08	.18
	<u>Teacher</u>						
Cactus	.19	.02	.07	.20	.21	.08	.22
Dinsmoor	.04	.02	.06	.06	.04	.06	.06
C-D	.09	.02	.07	.10	.10	.07	.10
	<u>Peer</u>						
Cactus	.14	.01	.07	.17	.14	.07	.17
Dinsmoor	.07	.00	.10	.11	.07	.10	.11
C-D	.10	.00	.08	.13	.10	.08	.13
	<u>Total Dependency</u>						
Cactus	.20	.01	.10	.21	.20	.10	.21
Dinsmoor	.14	.05	.14	.17	.15	.16	.18
C-D	.17	.02	.11	.18	.17	.11	.18

activity over and above the efficiency of evaluation, even though evaluation and activity were rather highly correlated.

Father evaluation best predicted father dependency in the Cactus group ($r^2_{DE} = .18$), and addition of the other SD dimensions added nothing ($R^2_{D,EPA} = .18$). Evaluation also predicted father dependency best in the Dinsmoor group ($r^2_{DE} = .15$), while potency was also a good predictor ($r^2_{DP} = .10$). When evaluation and potency were combined, predictive efficiency was increased ($R^2_{D,EP} = .20$). Potency was a better predictor at Dinsmoor than at Cactus.

Teacher evaluation was the single best predictor of teacher dependency in the Cactus group ($r^2_{DE} = .19$), and addition of teacher potency and activity increased efficiency slightly ($R^2_{D,EPA} = .22$). Neither of the SD dimensions were strongly related to teacher dependency in the Dinsmoor group ($R^2_{D,EPA} = .06$) and the relationship of the evaluation dimension ($r^2_{DE} = .04$) was slightly weaker than that of the activity dimension ($r^2_{DA} = .06$).

Peer evaluation was the best predictor of peer dependency in the Cactus group ($r^2_{DE} = .14$), and addition of the activity dimension increased predictive efficiency ($R^2_{DA} = .17$). Peer dependency was best predicted by peer activity in the Dinsmoor group ($r^2_{DA} = .10$), and the evaluation dimension added little to predictive efficiency ($R^2_{D,EA} = .11$).

In the Cactus group, total evaluation (the sum of father, teacher, and peer evaluation) remained the single best predictor of total dependency ($r^2_{DE} = .20$) and the further contributions of the other dimensions were minimal ($R^2_{D,EPA} = .20$). At Dinsmoor, however, activity and evaluation were equally related to dependency (r^2_{DE} and $r^2_{DA} = .14$), and their combination was more predictive ($R^2_{D,EA} = .17$).

Evaluation is a good predictor of father dependency, and the addition of the potency factor may increase predictive efficiency. Evaluation may or may not predict peer and teacher dependency, the success of dependency prediction depending on the population considered. The SD correlates of teacher dependency may be obscure in certain populations, but teacher dependency is best predicted by a combination of evaluation and activity. In some populations predictive efficiency would be low. Peer dependency is best predicted by a combination of evaluation and activity, since the respective contributions of the two factors vary according to the schools in which they are measured.

Comparison of Mean Father, Teacher, and Peer SD Ratings

The mean ratings for father, teacher, and peer on the three SD dimensions with the t-tests of the mean differences are shown in Tables 11, 12, and 13.

Table 11. Comparisons of Mean SD Evaluation Scores for Dependency Objects

Objects	Means		
	Cactus	Dinsmoor	C and D Combined
Father	23.64	23.09	23.37
Teacher	21.89	21.45	21.68
Peer	22.26	21.63	21.95

<u>t-test Comparisons</u>				
<u>Comparison</u>	<u>diff.</u>	<u>df</u>	<u>t</u>	<u>p</u>
F vs. T				
Cactus	1.75	92	3.12	< .01
Dinsmoor	1.63	89	2.38	< .05
C-D Combined	1.69	182	3.85	< .01
F vs. P				
Cactus	1.39	92	2.94	< .01
Dinsmoor	1.45	89	2.51	< .05
C-D Combined	1.42	182	3.83	< .01
T vs. P				
Cactus	-.37	92	.71	NS
Dinsmoor	-.18	89	.27	NS
C-D Combined	-.28	182	.68	NS

Table 12. Comparisons of Mean SD Potency Scores for Dependency Objects

Objects	Means		
	Cactus	Dinsmoor	C and D Combined
Father	20.20	20.41	20.31
Teacher	18.31	18.83	18.57
Peer	15.99	16.92	16.45

<u>t-test Comparisons</u>				
<u>Comparison</u>	<u>diff.</u>	<u>df</u>	<u>t</u>	<u>p</u>
F vs. T				
Cactus	1.89	92	4.50	< .01
Dinsmoor	1.58	89	2.43	< .05
C-D Combined	1.74	182	3.81	< .01
F vs. P				
Cactus	4.21	92	6.32	< .01
Dinsmoor	3.49	89	5.11	< .01
C-D Combined	3.86	182	7.78	< .01
T vs. P				
Cactus	2.32	92	3.47	< .01
Dinsmoor	1.91	89	2.75	< .01
C-D Combined	2.12	182	4.27	< .01

Table 13. Comparisons of Mean SD Activity Scores for Dependency Objects

Objects	Means		
	Cactus	Dinsmoor	C and D Combined
Father	20.16	20.13	20.15
Teacher	18.91	18.40	18.66
Peer	21.05	21.10	21.08

<u>t-test Comparisons</u>				
<u>Comparison</u>	<u>diff.</u>	<u>df</u>	<u>t</u>	<u>p</u>
F vs. T				
Cactus	1.25	92	2.35	< .05
Dinsmoor	1.73	89	2.85	< .01
C-D Combined	1.49	182	3.70	< .01
F vs. P				
Cactus	-.89	92	1.79	NS
Dinsmoor	-.97	89	1.92	NS
C-D Combined	-.93	182	2.63	< .01
T vs. P				
Cactus	-2.14	92	4.30	< .01
Dinsmoor	-2.70	89	4.37	< .01
C-D Combined	-2.41	182	6.14	< .01

The objects were ordered father (high evaluation)-peer-teacher on the evaluation dimension. Father was evaluated significantly more highly than was teacher ($p < .01$, C-D combined), and significantly more highly than peer ($p < .01$, C-D combined). Peer was not evaluated significantly more highly than teacher. The order of the objects on the evaluative dimension was identical with that found for dependency. While father and peer were similar as objects of dependency, however, teacher and peer were more similar regarding evaluation.

The potency mean ratings placed the objects in the order father (most potent)-teacher-peer. This order was different than the order along the dependency dimension. All differences were significant.

The objects were ordered peer (most active)-father-teacher along the activity dimension. For both groups, the father-teacher and teacher-peer differences were significant. The father-peer difference was not significant in either group, but did reach significance when the groups were combined ($p < .01$). The order of the object means was not consistent with the order on the dependency measure; however, if each school group was considered separately the father-peer similarity corresponded to that found on the dependency measure.

The analyses of the means explained the D-score results by revealing that the object orders on the potency

dimension led to an increase in the FP distance and decreased the FT distance. When the potency dimension was deleted, the combination of the evaluation order father-peer-teacher, and the activity order peer-father-teacher resulted in directional support for the similarity hypothesis.

Summary of Results

For greater clarity of presentation, the major results will be summarized in order to provide a single point of reference for the Discussion section which follows.

Personality Correlates of Dependent Response

The personality correlates of dependent response, as measured by the HSPQ, were generally specific to the object of dependency considered. They were further specific to the school population from which the measures were taken. Certain personality traits were correlated with father dependency, others with teacher dependency, and others with peer dependency. The relationships noted in one population were not replicated in the other. Although these findings could reflect the low predictive validity of the DQ, the directions of the significant correlations between DQ and HSPQ measures indicated that most probably the DQ reflected specificities in dependent response across objects and schools.

Effects of Objects of Dependency

Students did report higher probability of dependent response to father and peer than they did to teacher. This effect was general for both groups, in the directions and magnitudes of the differences. The effect of objects was considerably less marked, however, than was the effect of cues. Between-school differences were noted in teacher dependency and total dependency.

The Cues Effect

Reported probability of dependent response was heavily influenced by the effect of the cues offered by the objects. No differences were noted between neutral and negative cues. The differences between positive and other cues were general, relatively large, and very significant over different objects and different schools. The relative magnitudes of the F values for the main effects indicated that the cues variable accounted for much more of the total variance in dependent judgments than did the objects variable. If the object was engaging in an ongoing activity, i.e., reading or watching television, this condition was effective in lowering probability of dependent response.

SD Ratings of Objects

The three dependency objects, father, teacher, and peer were ordered differently along the three SD dimensions.

The order for the evaluation dimension was father-peer-teacher, with father being evaluated significantly more highly than peer or teacher. On the potency dimension, the order was father-teacher-peer, with all differences significant. For the activity dimension, the order was peer-father-teacher, with all differences significant. These results were stable across school groupings.

SD Correlates of Dependent Response

The SD evaluation, potency, and activity dimensions were positively correlated with dependent response. The relative proportions of the variance accounted for by the SD dimensions were, however, quite specific to the objects rated and the schools in which the ratings were made. Father dependency was best predicted by combined father evaluation and father potency scores. The proportion of the variance in dependency judgments accounted for by the evaluation dimension was smaller for peer and teacher dependency than for father dependency. The proportion of the variance accounted for by the potency and activity dimensions tended to be quite specific to the object considered and tended to vary according to the school in which the measures were taken.

The Similarity Hypothesis

The similarity hypothesis was evaluated in several ways. It was evaluated by predicting differences in the

D-scores for two and three SD dimensions. It was not supported. Hypotheses concerning the effects following grouping of subjects into father dependent and peer dependent groups were not adequately confirmed. Exploration of the relationships between SD dimensions and object dependency revealed that the objects were ordered differently on the different SD dimensions, and that no arrangement of objects on any SD scale corresponded precisely with the arrangement on the dependency dimension. Analysis of the proportion of variance contributed by each of the SD dimensions to father, teacher, and peer dependency revealed that the contributions of the dimensions were quite specific, depending on the object rated and the school membership of the rater.

The similarity hypothesis, either in its original form or in altered form, was not supported by the data. It could, indeed, not have been supported by the data, because no single SD dimension was generally related to dependent expression, over schools and objects. The results indicated that the dimensions underlying generalization of dependent response from father to others on the basis of their similarity either do not exist or remain undiscovered.

DISCUSSION

The conclusions of this study are of limited theoretical and practical generality due to the restricted nature of the sample of subjects, and the choices of objects, cues, and SD scales which were used. The data provided by replication over schools also suggest further limitations on the generality of the conclusions. Within the framework imposed by these limitations, the results do have implications for theory, for further research, and for practical applications by therapists, parents, and teachers.

Limitations Upon Generality of Conclusions

The first factor influencing generality of the conclusions is the nature of the student population which was studied. Eighth grade male students attending junior high schools serving middle class areas of the city participated in the study. The subjects were also better than average readers. In one of the schools, the students volunteered to participate in the study. Age and sex differences have been shown to occur in the expression of dependency, and it might also be reasonably assumed that differences due to socioeconomic factors also occur. Since the range of age, sex, and perhaps socioeconomic status factors was restricted

in the present study, generality of results should be limited accordingly.

Another factor limiting the generality of the conclusions is the restricted number of objects and cues which were used in the study. Subtle variations in meaning and level of dependency expression might result if responses toward other classes of persons were to be measured, for example, "my mother," "my brother," and "policemen." Within-class differences might also occur, for example if responses to "his father," "coach," or "my friend" were to be measured. Similarly there are many other possible cues which may be related to dependency expression besides those termed positive, neutral, and negative in this study. Such cues, for example, might involve the presence or absence of other individuals in the situation, and the number of other individuals in the situation.

There are several further limitations which involve the selection of scales used to measure stimulus similarity. There are many other dimensions along which parental similarity to teachers and peers could be measured, and the SD scales chosen represented only a fraction of the possible dimensions. Furthermore, the decisions made in adapting the SD technique to the present study involved deviations from standard SD technique, and therefore the evaluation, potency, and activity dimensions may have been measured somewhat differently from the way in which they have been

measured in other SD studies. In a more traditional SD study, "father" would have been presented along with 40-100 other "concepts" including perhaps "house," "tree," "enemy," and so forth. In the present study, SD ratings were made of only three persons, and the referents for the judgments were specific individuals instead of classes of individuals. These deviations from standard SD technique, in light of Heise's (1969) discussion of concept-scale interaction reported earlier, indicate that the SD measures should be interpreted as rough measures of connotative meaning, and not as precise measures of the evaluative, potency, and activity dimensions as they have been measured in other studies.

Generality of certain conclusions is also limited to some extent by the differences noted when the study was replicated using a second student sample. Since the methods and procedures used in the two schools were very similar, differences due to procedural variation were probably controlled. The replication limited the generality of the conclusions regarding the SD and HSPQ correlates of dependent response to father, teacher, and peer, while the absolute levels of dependency expressed, and the effects of cues were replicated, and may be considered to be of greater generality.

Theoretical and Practical Implications

One set of theoretical implications of the present study has already been discussed. The lack of confirmation of the similarity hypothesis combined with the confirmation of the response-cuing hypothesis tended to support Bandura and Walters' rather than Miller's formulation of displacement. The results also have bearing upon a related issue, that of behavioral generality versus behavioral specificity, an issue which has been recently discussed by Mischel (1968). Based upon the results of the present study, a limited number of suggestions may be presented to therapists, researchers, parents, and teachers.

Behavioral Generality versus Specificity

In Personality and Assessment, Mischel (1968) reviewed the evidence for the common assumption of behavioral generality across situations which has been basic to trait theories of personality. Mischel in fact defined trait theories as those which assume the existence of "relatively stable and enduring response predispositions that exert fairly generalized effects on behavior [p. 6]." After reviewing the evidence for these enduring response predispositions, Mischel concluded that "With the possible exception of intelligence, highly generalized behavioral consistencies have not been demonstrated [p. 146]." Conversely, he indeed concluded that "Considerable

specificity has been found regularly even in syndromes like attitudes toward authority, or aggression and dependency, whose assumed generality has reached the status of a cliché in psychological writings [pp. 36-37]."

Although the present study was not designed with the generality versus specificity issue in mind, the results are in accord with Mischel's conclusions. Specificities were indeed apparent in the variations noted between schools and between objects in the HSPQ and SD correlates of dependent response. The strong influence of cues for dependent response was also congruent with a behavioral specificity interpretation. Furthermore the feature of the study which would have supported generality of dependent response across situations by giving evidence for generalization gradients, did not result in support for behavioral generality.

An illustration of the way in which the results of the study could be interpreted in terms of behavioral specificity is seen by considering the finding that SD teacher evaluation accounted for a much greater proportion of the variance in teacher dependency at Cactus ($r^2_{DE} = .19$) than it accounted for at Dinsmoor ($r^2_{DE} = .04$). A post-hoc explanation of the finding, making the specificity assumption, might be as follows: Teachers are evaluated by other teachers, by members of the administration, and by students by different criteria at Cactus than at Dinsmoor. At Cactus

the criteria for positive evaluation overlap more with availability for and elicitation of dependency responses than they overlap at Dinsmoor. At Cactus, the role of the "good" teacher, as defined by students, administrators, and other teachers themselves, includes willingness to help, counsel, and advise students, to participate with students in extra-curricular activities, and perhaps to take a personal interest in them. At Dinsmoor, teacher evaluation is related to technical competence in teaching, promptness in turning in grades and reports, and perhaps the use of new innovative methods of teaching and grading. One would expect that the degree of overlap between evaluation and dependency elicitation would thus be greater at Cactus than at Dinsmoor.

The foregoing interpretation would be a fruitful area for future research. Although an account which involves such differences in referents for positive evaluation may indeed describe the salient difference between the two school situations, it is not to be considered as the only account, nor to be in any way supported by the data.

An interpretation of the results in terms of behavioral generality across situations would have to assume either that teacher evaluation was related to teacher dependency or that it was not, and that the between-school disparity was due to personality differences between teachers or students in the two schools, or perhaps to

unreliability or lack of validity of the measures themselves. Such assumptions are, of course possible and would also be suitable focal points for future research; however, if Mischel's conclusions are valid, such assumptions are less warranted than assumptions of behavioral specificity.

Suggestions for Research and Practice

Within the limitations imposed upon generality of results by the factors previously discussed, the results of the present study do have some implications for research and practice.

Since generalization gradients based upon parental similarity were not conclusively demonstrated in this study, and since the literature is also silent about what the dimensions underlying the gradients might be, it is suggested that therapists and diagnosticians limit their procedures accordingly. Diagnostically it would be more valid at this point to de-emphasize generalization processes in diagnostic assessments, and instead to assess factors which are more immediate in time and place to the situation in which the behavior to be assessed appears. Furthermore, therapies which attempt to change behavior in one situation, for example the consultation or play therapy rooms, and then depend upon generalization processes to transfer the newly changed behavior to more realistic situations would appear to be based on insufficient data. Since the dimensions

along which generalization processes occur are as yet unknown, and their role is the subject of theoretical dispute, it is now difficult to predict the intensity and direction of generalization effects, and premature to depend upon them as important therapeutic transfer processes. Therapies which attempt to change behavior in the situations where it naturally occurs would appear to be more closely aligned with the data.

The importance of the dependency-eliciting aspects of the situation implies that further research should be directed toward assessing the influences of situational variables, including the contingencies which operate in environments and the cues for those contingencies. As well as offering potential for better prediction in the individual case (Diener, 1967; Rotter, 1955), assessment of situations might offer direct answers to questions that are asked by parents, legislators, and others in positions of social responsibility, thereby serving a constructive and relevant social purpose. Such questions of the form "If my child has long hair, will he use drugs?," and "What will be the effects of certain changes in the welfare laws upon the economic productivity of welfare recipients?" might be more easily answered if more knowledge of the relationships between situational variables and behavior were available.

The data on cues for dependent response suggest that those who wish to encourage dependent responses should

inventory the numbers of cues for availability and non-availability that they typically exhibit. A parent who is often engaged in another behavior, such as reading a book or watching television, or a teacher who is often seen busily grading papers should not expect to elicit frequent dependent responses. Conversely, the parent or teacher who warmly greets his son or student, and who sets his work aside, might expect to be a more frequent object for dependency and perhaps a more significant source of constructive guidance.

APPENDIX A

CACTUS JUNIOR HIGH SCHOOL INTRODUCTION AND INSTRUCTIONS

Good morning. My name is Jerry Kucera, and I'm from The University of Arizona. You here at Cactus, along with students at Dinsmoor Junior High have been selected to participate in a research project which we're conducting at the University.

We are interested in the opinions of students, how they usually react in various situations, and their opinions and attitudes toward various people and things. I won't be able to tell you exactly what we hope to discover, although after we are finished, you may speak with Mr. L. and he will be able to fill you in a little more.

You will be filling out some questionnaires today for about an hour and a half. Your answers on these questionnaires are confidential, and of course, won't reflect on you in any way. They are not difficult, but if you have any questions, raise your hand and ask. Does everyone have a pencil or pen?

I would like you now to open your packet and take out the Reaction Questionnaire. Put your name and the date at the top, listen to the instructions carefully, and then begin when I tell you.

APPENDIX B

DINSMOOR JUNIOR HIGH SCHOOL INTRODUCTION AND INSTRUCTIONS

Good afternoon:

I'm sorry for the delay. We were a little longer in getting the lists prepared than we had thought. You have volunteered for our research project from the University and we are now ready to get started on it.

We are interested in the opinions of students, how they usually react in various situations, and their opinions and attitudes toward various people and things. I won't be able to tell you exactly what we hope to discover, although after we are finished you may speak with Mr. W. and he will be able to fill you in a little more in a couple of weeks.

You will be filling out some questionnaires today for about an hour and a half. Your answers on the questionnaires are confidential and of course, won't reflect on you in any way. They are not difficult, but if you have any questions, raise your hand. Does everyone have a pencil or a pen?

I would now like you to open your packet and take out the Reaction Questionnaire. Put your name and the date at the top, listen carefully to the instructions and then begin when I tell you.

APPENDIX C

INSTRUCTIONS TO DINSMOOR SUBJECTS-- SECOND ADMINISTRATION

Good Afternoon:

I have been able to score your reactions from the first phase of the study and would like to compliment you on your cooperation and care in filling them out. We are now ready for the final phase, where I'll ask you to fill out the first two questionnaires again with the same care which you showed before.

This final phase is most important, because we need to find out some technical aspects of the questionnaires--namely we need to see the degree to which people tend to respond the same way the second time they fill out the questionnaires.

I would like you, in filling them out, to keep the same persons that you used the first time. Do not change them. Use the same team-mate, male teacher, and your father. Are there any questions? I'll go over the instructions now shortly.

APPENDIX D

THE REACTION QUESTIONNAIRE

NAME _____

DATE _____

Before we begin the test, I would like you to pick two people, a team-mate about your own age, and a male teacher. Keep them in mind during the test. This can be anyone, but keep the same person, someone you know, in mind. In this test you will be telling your reactions to these persons, plus your father. If your father is deceased or for some other reason you do not know him well, pick a man who you look up to or who you could easily visualize as your father, and use him.

The sentences below describe situations involving these people. Below each sentence are four statements which could describe what you could do in that situation. In the blank in front of the statement, mark, using the guide below, how likely you would be to make that reaction in that situation. If you surely would do it, mark a 1, if you probably would do it, mark a 2, if you perhaps would do it, mark a 3, if you probably would not do it, mark a 4, and if you surely would not do it, mark a 5.

In this test there are no right or wrong answers, and each person answers what is true for him. Try to answer the questions as they apply to you, and never give an answer because you think it is "the right thing to say."

Remember, be sure to put a number in each blank. In filling out the blanks, try not to let your answer to any one influence your answer to any other. Do each one as if it were the only one on the test. Read each sentence carefully, they are all different. If there is anything that you do not understand, or if you have any questions, raise your hand and ask.

1	2	3	4	5
surely would	probably would	perhaps	probably would not	surely would not

1	2	3	4	5
surely	probably	perhaps	probably	surely
would	would		would not	would not

(Cue = Negative)

1. I'm walking around on the school-grounds during lunch break, and I see a team-mate of mine sitting alone on a bench. As I see him, he starts getting ready to leave. I would:

___ feel comfortable with him.

___ go over and suggest that we toss the ball around.

___ go over and spend some time just talking.

___ go over and ask his advice on how to do a better job in athletics.

(Cue = Positive)

2. My father is sitting on the couch at home. As I see him, he looks up as if he is glad to see me. I would:

___ feel comfortable with him.

___ go in and suggest something that we can do together.

___ go in and spend some time just chatting.

___ go in and ask his advice on a problem in school.

(Cue = Neutral)

3. One of my male teachers is sitting in the classroom after school. As I see him, he is working grading some papers. I would:

___ feel comfortable with him.

___ go in and volunteer for a special project on which I know he will be working with just a few students.

___ go in and talk with him for a while.

___ go in and ask his help on a particularly difficult lesson or personal problem.

1	2	3	4	5
surely	probably	perhaps	probably	surely
would	would		would not	would not

(Cue = Neutral)

4. My father is sitting on the couch at home. As I see him, he is reading the paper. I would:

___ feel comfortable with him.

___ go in and suggest something that we can do together.

___ go in and spend some time just chatting.

___ go in and ask his advice on a problem in school.

(Cue = Negative)

5. One of my male teachers is sitting in the classroom after school. As I see him, he turns around and starts making preparations to leave. I would:

___ feel comfortable with him.

___ go in and volunteer for a special project on which I know he will be working with just a few students.

___ go in and talk with him for a while.

___ go in and ask his help on a particularly difficult lesson or personal problem.

(Cue = Positive)

6. I'm walking around on the school-grounds during lunch break, and I see a team-mate of mine sitting alone on a bench. As I see him, he looks over, as if he is glad to see me. I would:

___ feel comfortable with him.

___ go over and suggest that we toss the ball around.

___ go over and spend some time just talking.

___ go over and ask his advice on how to do a better job in athletics.

1	2	3	4	5
surely	probably	perhaps	probably	surely
would	would		would not	would not

(Cue = Positive)

7. One of my male teachers is sitting in the classroom after school. As I see him, he looks up as if he is glad to see me. I would:

___ feel comfortable with him.

___ go in and volunteer for a special project on which I know he will be working with just a few students.

___ go in and talk with him for a while.

___ go in and ask his help on a particularly difficult lesson or personal problem.

(Cue = Neutral)

8. I'm walking around on the school-grounds during lunch break, and I see a team-mate of mine sitting alone on a bench. As I see him, he is reading a book. I would:

___ feel comfortable with him.

___ go over and suggest that we toss the ball around.

___ go over and spend some time just talking.

___ go over and ask his advice on how to do a better job in athletics.

(Cue = Negative)

9. My father is sitting on the couch at home. As I see him, he turns on the TV set and begins watching it with his back to me. I would:

___ feel comfortable with him.

___ go in and suggest something that we can do together.

___ go in and spend some time just chatting.

___ go in and ask his advice on a problem in school.

or

active : : : : : X : : : passive
 : : : : : X : : :

If you consider the person to be neutral on the scale, both sides of the scale equally associated with the person, or if the scale is completely irrelevant, unrelated to the person, then you should place your X in the middle space.

safe : : : : X : : : dangerous
 : : : : X : : :

IMPORTANT: (1) Place your X's in the middle of spaces, not on the boundaries.

 this not this
 : : : : X : : : :
 : : : : X : : : X : :

(2) Be sure to check every scale on every person--don't omit any.

(3) Never put more than one X on a single scale.

Do not look back and forth through the items. Do not try to remember how you checked similar items earlier in the test. Make each item a separate and independent judgment. Do not worry or puzzle over individual items. It is your first impression, the immediate "feelings" about the person, that we want. On the other hand, please do not be careless, because we want your true impressions.

FATHER

good	• • • • • • • • • • • • • • • •	bad
big	• • • • • • • • • • • • • • • •	little
quiet	• • • • • • • • • • • • • • • •	loud
unfriendly	• • • • • • • • • • • • • • • •	friendly
light	• • • • • • • • • • • • • • • •	heavy
fast	• • • • • • • • • • • • • • • •	slow
right	• • • • • • • • • • • • • • • •	wrong
strong	• • • • • • • • • • • • • • • •	weak
still	• • • • • • • • • • • • • • • •	moving
sad	• • • • • • • • • • • • • • • •	funny
short	• • • • • • • • • • • • • • • •	long
sharp	• • • • • • • • • • • • • • • •	dull

TEAM-MATE

friendly	• • • • • • • • • • • • • • • •	unfriendly
heavy	• • • • • • • • • • • • • • • •	light
slow	• • • • • • • • • • • • • • • •	fast
wrong	• • • • • • • • • • • • • • • •	right
weak	• • • • • • • • • • • • • • • •	strong
moving	• • • • • • • • • • • • • • • •	still
funny	• • • • • • • • • • • • • • • •	sad
long	• • • • • • • • • • • • • • • •	short
dull	• • • • • • • • • • • • • • • •	sharp
bad	• • • • • • • • • • • • • • • •	good
little	• • • • • • • • • • • • • • • •	big
loud	• • • • • • • • • • • • • • • •	quiet

MALE TEACHER

right	• • • • • • • • • • • • • • • •	wrong
strong	• • • • • • • • • • • • • • • •	weak
still	• • • • • • • • • • • • • • • •	moving
sad	• • • • • • • • • • • • • • • •	funny
short	• • • • • • • • • • • • • • • •	long
sharp	• • • • • • • • • • • • • • • •	dull
good	• • • • • • • • • • • • • • • •	bad
big	• • • • • • • • • • • • • • • •	little
quiet	• • • • • • • • • • • • • • • •	loud
unfriendly	• • • • • • • • • • • • • • • •	friendly
light	• • • • • • • • • • • • • • • •	heavy
fast	• • • • • • • • • • • • • • • •	slow

APPENDIX F

BEHAVIORAL CORRELATES OF HSPQ FACTORS (HSPQ HANDBOOK, IPAT, 1969)

FACTOR A. SIZOTHYMIA (A-, reserved, detached, critical, aloof, stiff) vs. AFFECTOTHYMIA (A+, warmhearted, outgoing, easygoing, participating).

critical	vs.	good natured, easygoing
stands by own ideas	vs.	ready to cooperate, likes to participate
cool, aloof	vs.	softhearted, casual
distrustful, skeptical	vs.	trustful
rigid	vs.	adaptable, careless, "goes along"
cold	vs.	warmhearted
prone to sulk	vs.	laughs readily

FACTOR B. LOW INTELLIGENCE (B-, dull) vs. HIGH INTELLIGENCE (B+, bright)

low mental capacity	vs.	high general mental capacity
unable to handle abstract problems	vs.	insightful, fast learning, adaptable

FACTOR C. EMOTIONAL INSTABILITY OR EGO WEAKNESS (C-, affected by feelings, emotionally less stable, easily upset, changeable) vs. HIGHER EGO STRENGTH (C+, emotionally stable, mature, faces reality, calm).

gets emotional when frustrated	vs.	emotionally mature
changeable in attitudes and interests	vs.	stable, constant in interests
easily perturbed	vs.	calm
evasive of responsibilities, tending to give up	vs.	does not let emotional needs obscure realities of a situation, adjusts to facts
worrying	vs.	unruffled
gets into fights and problem situations	vs.	shows restraint in avoiding difficulties

FACTOR D. PHEGMATIC TEMPERAMENT (D-, undemonstrative, deliberate, inactive, stodgy) vs. EXCITABILITY (D+, excitable, impatient, demanding, overactive, unrestrained).

stoical	vs. demanding, impatient
complacent	vs. attention-getting, showing off
deliberate	vs. excitable, overactive
not easily jealous	vs. prone to jealousy
self-effacing	vs. self-assertive, egotistical
constant	vs. distractible
not restless	vs. shows many nervous symptoms

FACTOR E. SUBMISSIVENESS (E-, obedient, mild, easily led, docile, accommodating) vs. DOMINANCE OR ASCENDANCE (E+, assertive, aggressive, competitive, stubborn).

submissive	vs. assertive, self-assured
dependent	vs. independent-minded
considerate, diplomatic	vs. stern, hostile
expressive	vs. solemn
conventional, conforming	vs. unconventional, rebellious
easily upset by authority	vs. headstrong
humble	vs. admiration demanding

FACTOR F. DESURGENCY (F-, sober, taciturn, serious) vs. SURGENCY (F+, enthusiastic, heedless, happy-go-lucky).

silent, introspective	vs. talkative
full of cares	vs. cheerful
concerned, reflective	vs. happy-go-lucky
incommunicative, sticks to inner values	vs. frank, expressive, reflects the group
slow, cautious	vs. quick and alert

FACTOR G. LOW SUPEREGO STRENGTH OR LACK OF ACCEPTANCE OF GROUP MORAL STANDARDS (G-, disregards rules, expedient) vs. SUPEREGO STRENGTH OR CHARACTER (G+, conscientious, persistent, moralistic, staid).

quitting, fickle	vs. persevering, determined
frivolous	vs. responsible
self-indulgent	vs. emotionally disciplined
slack, indolent	vs. consistently ordered
undependable	vs. conscientious, dominated by sense of duty
disregards obligations to people	vs. concerned about moral standards and rules

FACTOR H. THRECTIA (H-, shy, timid, restrained, threat-sensitive) vs. PARMIA (H+, adventurous, "thick-skinned," socially bold).

shy, withdrawn	vs.	adventurous, likes meeting people
retiring in face of opposite sex	vs.	active, overt interest in opposite sex
emotionally cautious	vs.	responsive, genial
apt to be embittered	vs.	friendly
restrained, rule-bound	vs.	impulsive
restricted interests	vs.	emotional and artistic interests
quick to see dangers	vs.	carefree, does not see danger signals

FACTOR I. HARRIA (I-, tough-minded, rejects illusions) vs. PREMSIA (I+, tender-minded, sensitive, dependent, over-protected).

unsentimental, expects little	vs.	fidgety, expecting affection and attention
self-reliant, taking responsibility	vs.	clinging, insecure, seeking help and sympathy
hard (to point of cynicism)	vs.	kindly, gentle, indulgent, to self and others
few artistic responses (but not lacking in taste)	vs.	affected, theatrical
unaffected by "fancies"	vs.	imaginative to inner life, and in conversation
acts on practical, logical evidence	vs.	acts on sensitive intuition
keeps to the point	vs.	attention-seeking, flighty
does not dwell on physical disabilities	vs.	hypochondrial, anxious about self

FACTOR J. ZEPPIA (J-, zestful, likes group action) vs. COASTHENIA (J+, circumspect individualism, reflective, internally restrained).

likes to go with the group	vs.	acts individualistically
likes attention	vs.	guarded, wrapped up in self
sinks personally into group enterprise	vs.	fastidiously obstructive
vigorous	vs.	neurasthenically fatigued
accepts common standards	vs.	evaluates coldly

FACTOR O. UNTRoubLED ADEQUACY (O-, self-assured, placid, secure, complacent, serene) vs. GUILT PRONENESS (O+, apprehensive, self-reproaching, insecure, worrying, troubled).

self-confident	vs.	worrying, anxious
cheerful, resilient	vs.	depressed, cries easily
inpenitent, placid	vs.	easily touched, overcome by moods
expedient, insensitive to people's approval or disapproval	vs.	strong sense of obligation, sensitive to people's approval and disapproval
does not care	vs.	scrupulous, fussy
rudely vigorous	vs.	hypochondriacal and inadequate
no fears	vs.	phobic symptoms
given to simple action	vs.	lonely, brooding

(The following three factors, Q₂, Q₃, and Q₄ have been found for certain only in the realm of questionnaire responses, hence their "Q" designation.)

FACTOR Q₂. GROUP DEPENDENCY (Q₂-, sociably group dependent, a "joiner" and sound follower) vs. SELF-SUFFICIENCY (Q₂+, self-sufficient, resourceful, prefers own decisions).

FACTOR Q₃. LOW SELF-SENTIMENT INTEGRATION (Q₃-, uncontrolled, lax, follows own urges, careless of social rules) vs. HIGH STRENGTH OF SELF-SENTIMENT (Q₃+, controlled, exacting will power, socially precise, compulsive, following self-image).

FACTOR Q₄. LOW ERGIC TENSION (Q₄-, relaxed, tranquil, torpid, unfrustrated, composed) vs. HIGH ERGIC TENSION (Q₄+, tense, frustrated, driven, overwrought, fretful).

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