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THE DEVELOPMENTAL INTERRELATIONSHIP OF ACHIEVEMENT PERFORMANCE EVALUATION, ACHIEVEMENT BEHAVIOR AND EGOCENTRISM

by

Ira Goodman

A dissertation submitted to the Graduate Faculty in Psychology in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York.

1978

This manuscript has been read and accepted for the Graduate Faculty in Psychology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

May 31, 1979
(date)

L. D. McGaugh
Chairman of Examining Committee

June 1, 1979
(date)

Florence L. Denmark
Executive Officer

Dr. Ian McMahon

Dr. Alden Wessman

Dr. Irwin Katz
Supervisory Committee

The City University of New York

Susan,

Through you, I gained strength and desire. With your love and inspiration, I traversed an obstacle filled road in search of this day. Today, I made a dream a reality. A reality which never would have been if not for you.

"Without thee I am all unblessed, and
wholly blessed in thee alone."

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ILLUSTRATIONS

I. BACKGROUND

The purpose of the present research is to investigate hypotheses related to achievement development derived from theoretical and empirical work on the attribution process, achievement motivation and cognitive development.

Heider's (1958) analysis of person perception processes, which is the foundation of attribution theory, identifies four variables which could be perceived as determining the outcome of an event. Two of these factors are environmental while two of the causative variables are person related. The environmental attributes which may be perceived as causing an event are task difficulty and luck. The personal qualities are broken into two classifications: Power, which is a person's ability, and motivation, which relates to the intention, effort, exertion or degree to which an individual "tries".

Heider (1958) suggested that an outcome "can" occur if a person's power or ability are greater than environmental factors. Whether an action "will" occur is determined by the joint influence of the "can" dimension, which is primarily dependent on ability, and the person's motivation or "try".

Heider's (1958) theory of attribution has been applied to analyses of and experimentation into achievement processes by Weiner and Kukla (1970). These researchers sought to determine how the dimensions of "can", as

defined by ability, and "try", as reflected in effort, influence an observer's evaluations of another person's achievement oriented activities. The basic paradigm used by these researchers, as well as others who will be referred to later, provides subjects with a series of stories which vary the presence or absence of a hypothetical stimulus person's ability and motivation as well as the success or failure of an achievement activity engaged in by the stimulus person.

In a series of three experiments by Weiner and Kukla (1970), subjects, acting as teachers, provided rewards and punishments to students depicted as having taken examinations. Each subject evaluated every story in the series. The first experiment was conducted with middle class college students. The second was done with male high school students who tended to be lower class. The third study was conducted with female student teachers.

The results of these three studies indicate that the amount of reward and punishment provided by subjects are related to the outcome of the achievement activity. Thus, the more successful the activity, the more it was rewarded. Conversely, the greater the failure, the more it was punished. Additionally, students who were motivated received more reward and less punishment than those who were not motivated. Finally, the research that used male college students and female student teachers as subjects indicated that stimulus persons with less ability receive more positive

and less negative feedback than high ability stimulus persons. Perceived ability had no impact on judgments made by the lower class high school male subjects.

Research by Rest, Nierenberg, Weiner and Heckhausen (1973) replicated the findings of Weiner and Kukla (1970) with regard to outcome and effort. However, these researchers also found that the role of ability was variable. In one study conducted with college students investigating the impact of immediate and usual effort expenditure, low ability was evaluated more highly than was high ability. However, in an experiment conducted with Swiss school teachers which investigated the impact of risk difficulty, there was no significant effect for perceived ability.

The work by Rest, Nierenberg, Weiner and Heckhausen (1973) as well as Weiner and Kukla (1970) utilized within subject designs wherein each subject made judgments about hypothetical students in all experimental conditions represented by a series of stories. Rest et. al. (1973) hypothesized that the judgments of the subjects might be affected by the perceived contrasts among the experimental conditions. Thus, the same subject would judge a student who was high in ability, high in effort and successful on the exam as well as another student who was low in ability but also high in effort and successful on the exam. Under such conditions, the outcomes may be viewed as similar and the low ability student would be given more reward than the pupil high in ability. Rest et. al. (1973) reasoned that

this was due to inferences that the low ability pupil tried harder than the high ability pupil to attain the identical outcome. They, therefore, suggested effort rather than ability may be the mediating evaluative dimension responsible for the differential reward.

To test this hypothesis, Rest et. al. (1973) employed a between subject design in which each college subject evaluated only one student story. Under this condition, no ability effect was obtained. However, subjective effort was influenced by the level of reported ability. When paired with the stimulus low ability, the amount of effort expended was perceived to be greater than when it was paired with the stimulus high ability.

This research suggests that the prior studies demonstrating that low ability is rewarded may have confounded ability and effort effects.

The work by Weiner and Kukla (1970) as well as Rest et. al. (1973) suggests that there are two factors which are primarily considered and have the greatest impact on rewards and punishment when judging achievement activities. They are the success or failure of an outcome and the motivational "try" factor or effort.

One question which derives from these works is the role of reward and punishment in shaping achievement behavior. Frankena (1963) and Nowell-Smith (1954) have contended that their function is to influence the behavior of others. If this is true, rewards and punishments should be

restricted to controllable actions and should not be associated with stable dispositions.

The research by Weiner and Kukla (1970) as well as work by Lanzetta and Hannah (1969) and Leventhal and Michaels (1971) demonstrate that when an individual attributes success to effort, rewards for achievement success are augmented. In similar manner, punishments for failure are associated with attributions of low effort. In each of these studies, effort was presumably perceived as an unstable factor which could be altered from moment to moment. Yet, effort can have the conceptual status of a stable personality disposition.

This question was pursued by Rest et. al. (1973) in a study referred to earlier which examined the effect of varying the degree to which a student was perceived as (a) generally trying hard, that is, as possessing effort as a trait, and (b) trying hard on a specific task. This research utilized a within subject design with college students evaluating a full series of stories. The data pertaining to effort evaluations indicate that rewards were augmented for those high in immediate effort as well as for those who were high in usual effort expenditure.

The finding that immediate effort on the task had a large influence on reward and punishment is consistent with Frankena (1963) and Nowell-Smith's (1954) conception of reward as a behavioral control device. While the function of rewarding high usual effort is not entirely clear, it

may be hypothesized that usual effort is valued in and of itself.

Further support for this position is evident in work by Weiner, Heckhausen, Wulf-Uwe Meyer and Cook (1972). In this study, elementary school age boys were administered the Intellectual Achievement Responsibility (IAR) Scale. An individual's total score on the IAR scale may be partitioned into four subscales representing the tendency to ascribe success to effort, failure to a lack of effort, success to ability and failure to a lack of ability. The subjects were then given achievement related puzzles to solve and given the opportunity to reward or punish themselves according to the outcome of their activity. The data indicate the following relation: The greater the tendency to attribute success, rather than failure, to effort, the greater the self reward for success relative to self punishment for failure.

This finding linking reinforcement to a stable motivational disposition provides further support for the influence of a cultural ethic which holds that one "ought" to try hard.

Weiner (1973) and Weiner and Peter (1973) have suggested that there is a similarity between the ethical system of achievement and the value system of morality. The similarity between these systems is based on the mediational role of effort in causal ascriptions among older children and adults. It has been documented by

Piaget (1932) that evaluations of moral situations are determined by an actor's subjective intent when judged by children 9 years of age through adult, and is affected by the objective outcome of an activity for children under 7 years old. In light of the similarity in the determinants of adult evaluation, it may be hypothesized that achievement appraisal follows the same cognitive developmental sequence as moral judgment.

To test this question, an experiment was conducted by Weiner and Peter (1973) with children ages 4-12 years. Methodologically, the study employed a modification of the paradigm used by Weiner and Kukla (1970) by presenting a series of achievement and moral situations to each subject. The achievement related story involved a child working at a puzzle task. The child was characterized according to ability (present or absent), "trying" (yes or no), and the consequences of the action (completion and success or incompletion and failure).

The moral incident was a variant of the "lost child" theme used by Piaget (1932). A lost child was depicted as seeking help to get home in time for dinner. An older child in the story either did or did not know the correct directions (ability), did or did not want to help (intent), and the lost child either did or did not get home in time (outcome).

Subjects evaluated each of the hypothetical performances by giving from one to five gold stars (reward) or

from one to five red stars (punishment).

The data indicate that among the children younger than 7 years objective outcome was the primary factor in moral judgment. That is, reward was dispensed if the child got home, while punishment generally was given if the child did not return home. But by the age of 7, perceived intent was the information most used to determine morality. And, after 9 years of age, intent was the only significant determinant of moral evaluation. These data are consistent with the observations of Piaget (1932).

In the achievement data, a similar developmental pattern is observed although at somewhat later ages. Among children younger than 7-9 years old, outcome was a more important evaluative determinant than was effort. This relationship was reversed among 10-12 year olds. It should be noted that although this paper only focuses on data for children through age 12, Weiner and Peter (1973) found outcome again became an important evaluative cue in children 13-18 years old.

Thus, achievement and moral evaluation seem to follow similar developmental sequences with effort or intent replacing outcome as the main factor in social interaction.

Shifting from the evaluational to the behavioral aspects of morality, Piaget (1932) investigated how children practice or apply rules in a marble game. He found they progress through four stages. Initially, the child handles a marble as he desires in order to explore its essence.

From about the age of 2 years until around the age of 5 years, the child is in the second stage of moral development. The child learns to imitate the codified rules of the other children. However, the child plays either by himself without bothering to find playmates or with others but without trying to win. Piaget terms this type of behavior, which combines imitation of others with purely individual use of the examples, egocentrism.

The third stage, incipient cooperation, is observed in children 7-8 years old. In this phase, the players try to understand each other and develop a unified body of rules for governing the activities of the game. Each child, while observing these common rules, seeks to win. Unlike the previous stage, the child now enjoys the social aspects of the game.

In the fourth stage, children 11-12 years of age have codified the rules of a game. Every procedural detail in the game is fixed and the actual code of rules to be observed is known to every member of the group. The children in this phase understand that they can make and change rules.

Thus in the application of rules, the child progresses from self-centered to socially oriented behavior. This unfolding of moral activity appears similar to the development of achievement behavior as theorized by Veroff (1969).

He hypothesizes two stages of achievement behavior: Self-comparative or autonomous achievement behavior in which

one's own accomplishments are judged against internalized personal standards and social comparison achievement behavior in which standards of excellence are based on social comparison.

Veroff (1969) found that the tendency to evaluate achievement behavior relative to one's own performance is predominantly found among younger children. He found that autonomous achievement behavior peaks in 7-9 year olds and thereafter decreases.

Social comparison achievement behavior, which reflects a child's interest in achieving favorable comparison with others or avoiding unfavorable comparison, predominates among older children. The trend in the development of this stage demonstrates a dramatic increase in children 7-9 years old and maintains a stable dominance through age 12.

Thus, the similarities that have been found between achievement and moral evaluational as well as behavioral activities suggest that the development of these cognitive systems may be affected by the same factors. Therefore, it is proposed that hypotheses concerning the development of achievement processes may be derived from the morality literature.

In his treatise on morality, Piaget (1932) indicates that children who play marbles in an egocentric manner also demonstrate egocentric speech. According to his position, egocentrism in communication, behavior or thought similarly demonstrate a confusion of the ego with the external world

and a general lack of cooperation. He suggests that for cooperation to occur a child must be conscious of his ego and liberate it from the thought and will of others. This can occur when the child views older children and adults more and more as equals and has the opportunity to freely contrast his point of view with that of others. From that point, he will not only discover the boundaries that separate his self from other people, but he will learn to understand the other person and be understood by him.

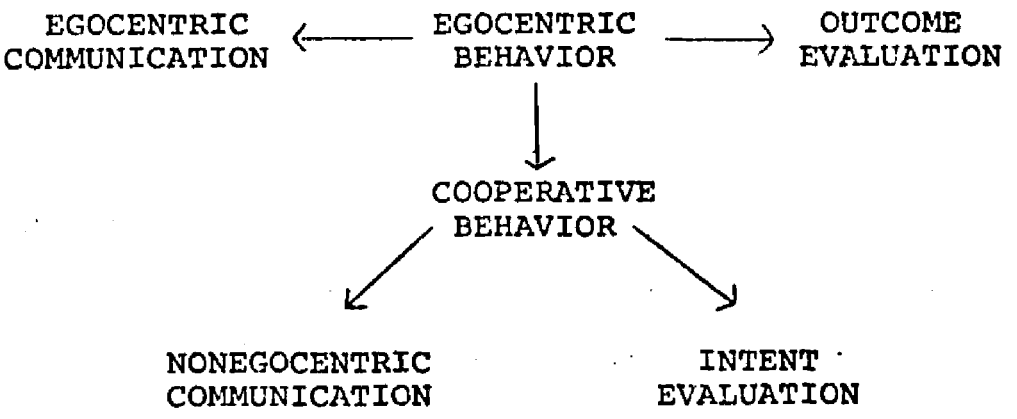
Thus, communicative and behavioral patterns start out egocentrically and as the child's behavior becomes more social or less egocentric his language follows.

Piaget (1932) suggests a similar developmental relation between moral behavior and evaluation. He indicates that as a result of the child's need to reconstruct symbolically operations which took place in action, there is a time lag between the concrete phases and the verbal phases of moral processes. Heteronomous thought, which is centered on the outcome of an act, would be found with egocentric behavior. Cooperative behavior, a more mature level which is concerned with social relations, would be followed by autonomous thought. This thought process is less egocentric and allows one to consider the intentions of an actor. (Piaget's (1932) and Veroff's (1969) use of the term autonomous are not equivalent.) Finally, communicational as well as evaluational processes should be at similar evolutionary stages as a result of their mutual

dependence on behavior. Figure 1 presents the theoretical model of moral development suggested by Piaget's work.

FIGURE 1

THEORETICAL DEVELOPMENTAL INTERRELATIONSHIPS AMONG MORAL EVALUATION AND BEHAVIOR AND EGOCENTRIC COMMUNICATION



It should be noted that Piaget (1932) considered cognitive development an unfolding process which is mediated by stage maturity rather than age. Therefore, while the developmental changes may be found related to chronological maturity, the hypothesized relations should be related when age is controlled.

Prior empirical work lends some support to the developmental model of moral processes. Glucksberg and Krauss (1967) as well as Rubin (1973) found younger children to be more egocentric in their verbalizations than older children. With regard to moral judgments Lee (1971) as well as Weiner and Peter (1973) rely less on the objective impact of an act and more on the subjective intentions of an actor. Lee (1971) further found that significant correlations between cognitive components and moral judgment remain significant with age partialled out. Finally, Rubin and Schneider (1973) investigated the relationship existing between moral judgment, egocentrism and moral behavior. They found positive correlations between measures of communicative egocentrism and moral judgment and the incidence of altruistic behavior among children 7 years old.

Application of the foregoing analysis to achievement processes suggests that children whose behaviors tend to be egocentric, as in Veroff's (1969) self-comparative or autonomous achievement behavior, should tend to speak egocentrically and make achievement evaluations based on

the outcome of an act. Some time after children's behavior becomes more socially oriented, as in Veroff's social comparative achievement behavior, their verbalizations will become less egocentric and their evaluations will become more reliant on the intentions of another. Figure 2 depicts this hypothesized model for achievement processes.

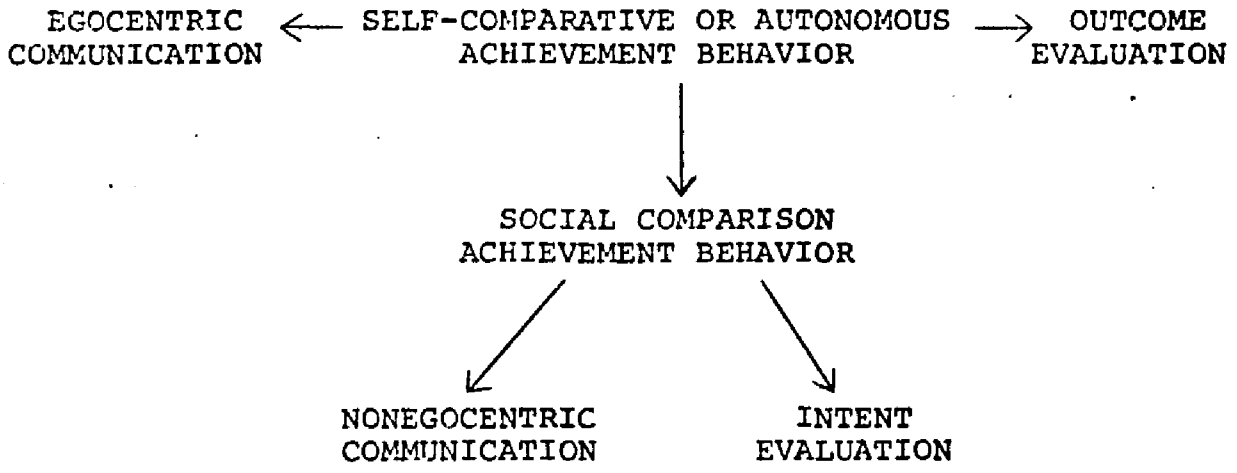
FIGURE 2

THEORETICAL DEVELOPMENTAL

INTERRELATIONSHIPS AMONG ACHIEVEMENT

EVALUATION AND BEHAVIOR AND

EGOCENTRIC COMMUNICATION



It should be noted that the model presented in Figure 2 does not include age as an independent variable. This is in line with Piaget's (1932) theoretical orientation which places greater emphasis on cognitive stages than chronological determinants. Therefore, while age may be associated with cognitive and behavioral changes, the relation among the processes depicted in Figure 2 would not be expected to weaken when chronology is controlled by statistical partialling.

In summary, it is being suggested that parallels can be found between moral and achievement evaluation as well as behavioral processes. This implies that hypotheses derived from Piaget's (1932) work on morality may be applicable to research on achievement processes. The specific hypotheses concerning the interrelationship between communication, achievement evaluation and behavior which are under study are as follows:

1 - Self-comparison or autonomous achievement behavior is positively associated with outcome evaluation and immature egocentric communication.

2 - Self-comparison achievement behavior parallels the development of social comparison achievement behavior.

3 - Social comparison achievement behavior is positively correlated with nonegocentric communication and intent evaluation.

II. METHOD

Subjects

A total of 80 white middle class boys were tested from the kindergarten, second, fourth and sixth grades of three eastern public schools. The children in each of the respective grades had average ages of 5, 7, 9 and 11 years. Within each of the four grade levels, twenty subjects were studied. Because parental permission was required for each participating child, self selection processes may have generated a sample which was different from the general student population. In addition, the schools which participated in the study maintained strict control over information regarding the participants and non-participants so that comparisons between these groups on general characteristics could not be determined.

Procedures

The children were tested individually in empty classrooms in their own schools by two trained female assistants.

Children were introduced to the study by being told that they would be playing several games that they would find enjoyable. Tasks which measured achievement performance evaluation, achievement behavior and egocentrism were then presented to each subject in a random order.

Achievement performance evaluation was measured using the method developed by Weiner and Peter (1973). This involved presenting an achievement related scenario which

described a child working at a puzzle task. Eight experimental conditions, which were read to each subject, had been created by varying the character of the child in the story according to ability (present or absent) "trying" (yes or no) and consequences of the action (completion and success or incompletion and failure). Subjects assigned one to five stars of red or gold to each experimental condition as an indication of their evaluation of the character. One red star represented a mild punishment and one gold star indicated a mild reward. At the other end of the scale, five red stars indicated a strongly negative evaluation and five gold stars represented a strongly positive evaluation.

A score for each subject reflecting the value of ability, intent, or outcome was obtained via the following procedures:

1. Each gold star was given a positive value (+) and each red star was given a negative value (-).

2. The values given by each subject were summed across each of the four stories in which a particular characteristic was present. This was also done for the four stories in which the particular characteristic was absent.

3. The summed value for stories lacking a characteristic was subtracted from the summed value for stories where a characteristic was present.

Appendix A contains the interviewer's directions to the subjects as well as the eight stories.

Achievement behavior was measured utilizing procedures developed by Veroff (1969). These procedures are based on Atkinson's (1964) formulation of achievement risk behavior. According to this position, a choice of moderate difficulty may represent a positive resultant achievement tendency. The choice of either the easiest task or the most difficult one is assumed to be a choice reflecting a negative, avoidant tendency. That is, the child in selecting a very easy or a very difficult task is avoiding challenge or avoiding achievement risk.

In Veroff's (1969) procedures, indications of each child's autonomous or self-comparison achievement behavior were obtained via three tasks. The first task used six strings made with increasing numbers of beads that varied by shape and color. Subjects were asked to duplicate the bead pattern presented by the experimenter after it was removed from view. The second task was a basket throw in which each subject attempted to get a wiffle ball into a pail from increasing distances on successive trials. The third, a picture memory task, was administered by presenting cards which contained increasing numbers of pictures. As each card was presented and removed from view, the children tried to remember the pictures they had seen.

After the second failure within each of the three tasks, subjects were asked to choose the item which they wanted to repeat from among the first item, the last success, the first failure and the second failure. The two middle items (last

success and first failure) were designated as choices of challenge and were interpreted as indicating the presence of achievement motivated behavior. By summing the number of challenging choices made on all three tasks, self-comparison achievement scores were created for each subject. Appendix B contains the directions for these tasks.

To measure social comparison achievement behavior, subjects were presented with a set of three similar envelopes or boxes. The boys were told that one container was an item that "most boys your age can do" while the other container had an item "some boys your age can do and some boys cannot" and the last container had an item that "most boys your age cannot do". The subjects were asked to indicate which of the three items they preferred to work on. This procedure was repeated three times for each boy by using two sets of different size envelopes as well as a set of boxes. It was indicated to each child that one set of envelopes contained tasks, while the other set of envelopes contained puzzles and the boxes contained games. Appendix C contains the directions for these tasks.

Following Veroff and Peele (1962), these tasks were scored two ways. First, a social comparison achievement behavior indicator was obtained by scoring the moderately difficult item as a one while the easy and difficult items were scored as zeroes. The values on each of the selected items were summed for each subject to obtain a social comparison achievement behavior score. This score represents

the degree to which a child has social comparison achievement motivation.

Second, a difficulty score was obtained using the ranked value of the items. Each easy item ("most boys your age can do") was counted as a one, each moderately difficult item ("some boys your age can do and some boys cannot") was counted as a two and each difficult item ("most boys your age cannot do") was counted as a three. The values of the selected items were summed for each subject to obtain a difficulty score.

It should be noted that this second measure provides an indication of the absolute level of difficulty which a child selects. It does not provide an indication of a child's achievement motivation, within the framework of Veroff's theory.

Administration of the communicative egocentrism task followed the procedures of Rubin (1973). The subject and the interviewer had identical sets of graphic designs. These designs were novel, low encodable graphics. The subject described one card at a time while the interviewer selected the appropriate card. The subject and interviewer were separated by a partition to eliminate the opportunity for visual display of the graphics. Appendix D contains the six novel figures and the directions that were told to each subject. All conversation for this task was tape recorded and transcribed. From this, the mean number of distinctive features per item that were communicated by the subjects

was computed. The lower the score the more egocentric was a child while the higher the score the more non-egocentric were his communications.

A distinctive feature was defined as any utterance in which a separate and unambiguous description of the target item was given. Examples include: "It looks like a lemon" or "on one side there is an arrow pointing to a square." In the latter description, there are two distinctive features--arrow and square. An indistinctive feature included ambiguous statements concerning the target item. For example: "It goes up and down and a line goes off to the right." Since there is no one way to look at the items, "to the right" is ambiguous. If on the other hand, the subject said, "There is an arrow, and if you hold the card so that the arrow is pointing up, then on the right there is a square" -- "on the right" would be a distinctive feature.

Two raters scored each subject's verbal communications. The correlation coefficient for the interscorer reliability was +.83.

III. RESULTS

Replication of Earlier Research

This section will relate the current findings to the earlier work done on achievement behavior, achievement evaluation and egocentric communication. Data dealing with the interrelationship among these areas will be reported in the next section of this chapter.

Achievement Evaluation

As noted earlier, the work by Weiner and Peter (1973) demonstrated that evaluations of the achievements of others are dependent on either the perceived outcome of the act or intent of the actor. They found that the primary determinant for observers between the ages of 7 and 9 years old was the outcome of an act. Children 10 to 12 years old were found to rely more on the intentions of the actor in evaluating an achievement oriented activity.

The results of the present study demonstrate this same developmental trend: Children younger than 9 years old put greater stress on the outcome of an individual's action while older children gave greater consideration to the intentions of the actor (See Figure 3 and Table 1). This age trend is, generally, in line with the key developmental points identified by Weiner and Peter (1973). These data were subjected to an analysis of variance (See Table 2). The results of this analysis demonstrate that the age trends are significant for both the evaluative cues of outcome evaluation ($F = 10.2$, $df = 3, 608$, $p < .01$) and intent evaluation

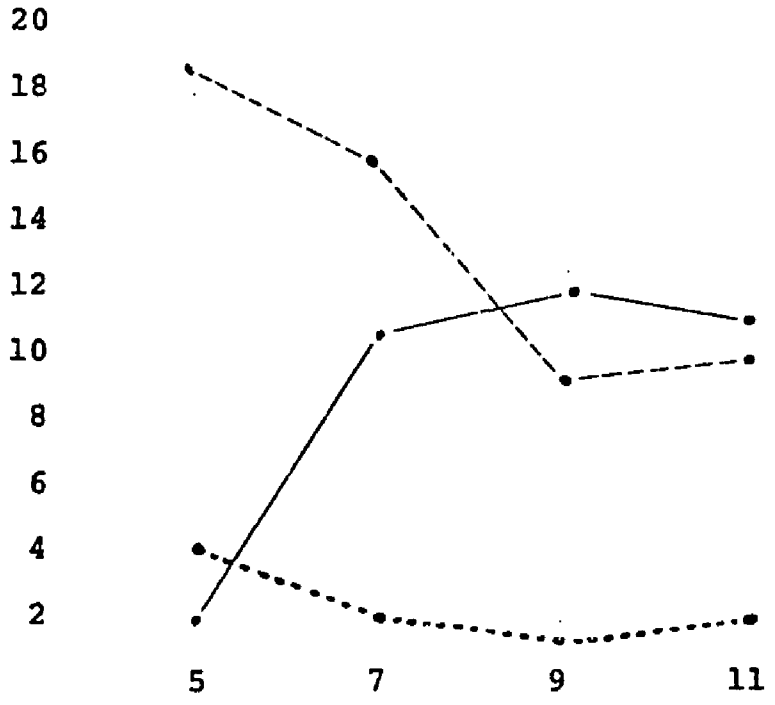
(F = 8.7, df = 3, 608, $p < .01$).

The current data also support Weiner and Peter's (1973) results indicating significant main effects for outcome evaluation (F = 394.1, df = 3, 608, $p < .01$), intent evaluation (F = 181.7, df = 3, 608, $p < .01$) and age (F = 2.7, df = 3, 608, $p < .05$) (See Table 2).

FIGURE 3

MEAN OUTCOME, INTENT AND ABILITY

EVALUATION SCORES BY AGE



Note:

.------. Outcome evaluation

._____. Intent evaluation

..... Ability evaluation

TABLE 1

MEANS AND STANDARD DEVIATIONS FOR EGOCENTRIC COMMUNICATION, ACHIEVEMENT EVALUATION AND BEHAVIOR BY AGE

Chronological Age		Evaluative Cues			Comparative Achievement Behavior			Communication
		Outcome	Intent	Ability	Self	Social	Social Difficulty	Non Egocentric
5	M	18.8	2.8	3.7	1.3	.5	3.8	7.2
	S.D.	(8.3)	(4.2)	(8.7)	(1.1)	(.7)	(1.3)	(4.0)
7	M	14.8	10.5	1.8	1.7	1.0	5.6	8.4
	S.D.	(11.2)	(6.7)	(6.0)	(1.1)	(.9)	(2.0)	(3.1)
9	M	9.8	11.9	.1	1.7	1.3	7.0	11.3
	S.D.	(7.2)	(7.7)	(5.0)	(.8)	(1.0)	(1.4)	(4.6)
11	M	10.9	11.7	1.1	1.2	1.2	7.8	12.0
	S.D.	(6.9)	(8.1)	(4.4)	(1.0)	(1.1)	(1.1)	(4.6)
	Mean	13.6	9.1	1.9	1.4	1.0	6.1	9.7
	Standard Deviation	(9.3)	(7.8)	(6.5)	(1.0)	(1.0)	(2.1)	(4.6)

TABLE 2

ANALYSIS OF VARIANCE:
ACHIEVEMENT JUDGMENTS

Source	df	MS	F	p
Outcome (O)	1/608	1856.4	394.12	<.01
Intent (I)	1/608	855.62	181.66	<.01
OI	1/608	12.10	2.57	n.s.*
Ability (A)	1/608	26.41	5.61	<.05
OA	1/608	6.01	1.28	
IA	1/608	3.03	.64	
OIA	1/608	4.90	1.04	
Age (Y)	3/608	12.54	2.66	<.05
OY	3/608	47.97	10.19	<.01
IY	3/608	41.05	8.72	<.01
OIY	3/608	3.04	.65	
AY	3/608	5.78	1.23	
OAY	3/608	2.97	.63	
IAY	3/608	3.25	.69	
OIAY	3/608	5.74	1.22	

Note:

n.s.* - Not significant, $p > .05$

Correlational analyses presented in Table 3 provide further evidence of the strength and direction of the relation between age and the cognitive cues. Age and outcome demonstrate a significantly negative correlation ($r = -.34$, $p < .01$). Age and intent evaluation are found to have a significantly positive association ($r = +.39$, $p < .01$). Thus, as a child grows older, it appears there is less regard for the outcome of an act and more consideration of the intentions of an actor.

To verify that individuals were shifting from outcome to intent evaluation, an internal analysis of the data was conducted. Each subject's intent evaluation score was subtracted from his outcome evaluation score producing a difference score. This difference score was subjected to an analysis of variance. The results of that analysis confirm that with age children shift from outcome to intent evaluation ($F = 8.7$, $df = 3/76$, $p < .01$).

Finally, the current research supports Weiner and Peter's (1973) finding that ability is not a key developmental evaluative cue. The data in Table 1 indicate that observers of all ages tested consider ability of an actor to a far lesser extent than either of the other two evaluative cues. And, the analysis of variance posted in Table 2 indicates that ability does not demonstrate a significant developmental trend ($F = 1.1$, $df = 3, 76$, $p > .05$). Although, it does demonstrate a significant main effect ($F = 26.4$, $df = 3, 608$, $p = <.05$) which was not obtained

by Weiner and Peter (1973). The correlational analysis reported in Table 3 corroborates the finding that ability and age have a nonsignificant association ($r = -.16$, $p > .05$).

TABLE 3

CORRELATION MATRIX FOR AGE, NON-EGOCENTRIC COMMUNICATION, ACHIEVEMENT EVALUATION AND BEHAVIOR

(N = 80)

		Evaluative Cues			Comparative Achievement Behavior			Communication
Variable	Age	Outcome	Intent	Ability	Self	Social	Social Difficulty	Non-Egocentric
Evaluative Cues								
Outcome	-.34**							
Intent	+.39**	-.34**						
Ability	-.16	-.03	-.18					
Comparative Achievement Behavior								
Self	+.02	+.15	-.12	-.04				
Social	+.26*	-.11	+.08	-.22*	+.21			
Social Difficulty	+.70**	-.36**	+.35**	-.17	+.05	+.11		
Communication								
Nonegocentric	+.40**	-.07	+.36**	-.04	-.12	+.21	+.43**	

Note:

* $p < .05$
** $p < .01$

Achievement Behavior

The work by Veroff (1969) indicates that younger children tend to evaluate their achievement behavior relative to their own performance. The role of this autonomous achievement behavior was found to peak among children 7-9 years old and decrease with further development.

Veroff (1969) also found social comparative achievement behavior to be applied most often by older children. A dramatic increase in its use was reported to occur among children 7-9 years old. The utilization of this behavioral mode then remained stable through age 12.

The current research provides only weak support for these developmental patterns. Figure 4 and Table 1 suggest that autonomous achievement behavior does peak among 7-9 year olds while decreasing slightly among children aged 11 years. However, these age trends are not significant as indicated by the analysis of variance ($F = 1.4$, $df = 3, 76$, $p > .05$; See Table 4). Utilizing an Eta statistic, it was also determined that age and autonomous achievement behavior demonstrate the hypothesized curvilinear association ($F = .91$, $df = 3, 76$, $p > .05$).

The hypothesized relation between age and social comparative achievement behavior was clearly obtained. As expected, social comparative behavior was found to increase substantially in children 7-9 years old with the level maintained through age 11. (See Figure 4 and Table 1). The linear correlation indicates that this positive assoc-

iation is significant (r = +.26, $p < .05$; See Table 3). The analysis of variance corroborates that the relation between these two variables is significant (F = 3.0, df = 3, 76, $p < .01$; See Table 4).

TABLE 4

ANALYSIS OF VARIANCE OF ACHIEVEMENT BEHAVIOR AND COMMUNICATION AS A FUNCTION OF AGE

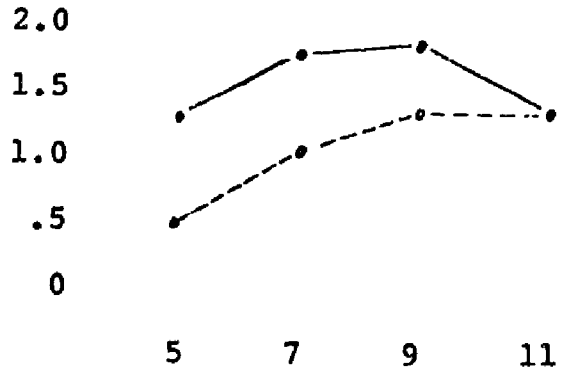
Variable		df	MS	F	p
Comparative Achievement Behavior	Self	3/76	1.6	1.4	n.s.*
	Social	3/76	2.7	3.0	<.01
	Social Difficulty	3/76	63.1	27.4	<.01
Communication	Non-Egocentric	3/76	104.4	5.8	<.01

Note:

n.s.* - Not significant, $p > .05$

FIGURE 4

MEAN AUTONOMOUS ACHIEVEMENT BEHAVIOR AND SOCIAL COMPARATIVE ACHIEVEMENT BEHAVIOR BY AGE



Note:

•_____• Indicates autonomous achievement behavior

------- Indicates social comparison achievement behavior

Nonegocentric Communication

Finally, Glucksberg and Krauss (1967) as well as Rubin (1973) found younger children tended to be more egocentric in their verbal communications than older children. The analysis of variance presented in Table 4 indicates that there are significant changes in verbal style across age groups ($F = 5.8$, $df = 3, 76$, $p < .01$). In addition, the correlation reported in Table 3 indicates, as expected, that as children become older their verbalizations become less egocentric ($r = -.40$, $p < .01$).

Thus, the current research, generally, replicates earlier work in the areas of achievement evaluation, achievement behavior and egocentric communication. The major disparity observed dealt with the relation between autonomous achievement behavior and age.

Findings Related to the Current Theoretical Issues

This section will address the hypothesized and empirical relations among the cognitive and behavioral variables under study.

The model presented earlier (Figure 2) suggests the following relations among the cognitive and behavioral variables: 1) Negative correlations between autonomous achievement behavior and nonegocentric communication and, 2) Positive correlations between autonomous achievement behavior and outcome evaluation; social comparative achievement behavior and nonegocentric communication, intent evaluation and autonomous achievement behavior.

To test these hypotheses, linear correlations were obtained and are presented in Table 3. These statistics, generally, are in line with the predicted directional relationships. However, none of the associations is significant. The predicted positive associations were obtained between social comparative achievement behavior and nonegocentric communication ($r = +.21$, $p > .05$); autonomous achievement behavior and outcome evaluation ($r = +.15$, $p > .05$); social comparative achievement behavior and intent evaluation ($r = +.08$, $p > .05$) as well as self and social comparative achievement behavior ($r = +.21$, $p > .05$). The predicted negative association was demonstrated between autonomous achievement behavior and nonegocentric communication ($r = -.12$, $p > .05$).

Because Veroff (1969) indicated that the development

of autonomous achievement behavior may be curvilinear, Eta statistics were calculated for each of the previously mentioned associations with this behavior. None of these was found to be significant non-linear associations: Autonomous achievement behavior and outcome (F = 1.8, df = 1, 78, $p > .05$); social comparative behavior (F = 1.2, df = 1, 78, $p > .05$); communication (F = .91, df = 1, 78, $p > .05$).

The failure of these variables to achieve significance may be due to the standard deviations of the behavioral variables. Both social and self-comparative achievement behavior had the smallest standard deviations of all the variables (See Table 1). In general, the more narrowly restricted the standard deviation of a variable, the lower will be its correlation with other factors.

Alternatively, another theoretical model than that proposed earlier may better explain the data. This explanation will be pursued at this point. The correlation matrix presented in Table 3 indicates that intent evaluation is positively correlated with non-egocentric communication (r = +.36, $p < .01$) and negatively associated with outcome evaluation (r = -.34, $p < .01$). These respective associations remain significant with age partialled out (r = +.26, $p < .05$; r = -.47, $p < .01$) (See Table 5). These data suggest that the cognitive factors related to thought and speech may develop as a unit independent of age. In addition, the lack of association between

TABLE 5

CORRELATION MATRIX FOR NON-EGOCENTRIC COMMUNICATION, ACHIEVEMENT EVALUATION AND BEHAVIOR WITH AGE PARTIALLED OUT
(N = 80)

	Evaluative Cues			Comparative Achievement Behavior			Communication
Variable	Outcome	Intent	Ability	Self	Social	Social Difficulty	Non-Egocentric
Evaluative Cues							
Intent	-.47** (-.34)						
Outcome							
Comparative Achievement Behavior							
Self							
Social			-.18 (-.22)				
Social Difficulty	-.18 (-.36)	+.38** (+.35)					
Communication							
Nonegocentric		+.26* (+.36)				+.23* (+.43)	

Note: Figures in parentheses are the significant zero-order correlations from Table 3.

* $p < .05$
** $p < .01$

language and outcome evaluation along with the former's positive association with intent evaluation suggests that immature levels of language and thought may develop independently. But for the mature levels of these variables to unfold, they must interact with each other.

The data were then subjected to a step-wise multiple-regression analysis. In a step-wise regression, the single most important predictor variable of a criteria variable is first identified. At step two, the variable which, when combined with the first variable, contributes significantly to the prediction is identified. This process is continued until the impact of all predictor variables is calculated. Each of the six variables except age was considered a criterion variable in the testing series. In addition, a partial F analysis was conducted. It was done to determine which variable(s) significantly predicted the criterion variable under consideration when all the other variables were statistically controlled through partialling (See Tables 6-10).

If the contribution of a predictor variable is significant in a stepwise regression but is not in a partial F analysis, it may be hypothesized that the variable gains its predicteve power from interactions with other (especially significant) predictor variables which are controlled by this statistic.

On the other hand, if a predictor variable is not significant in a stepwise regression but is in a partial F

TABLE 6

MULTIPLE REGRESSION ANALYSIS FOR THE DEPENDENT VARIABLE OUTCOME EVALUATION

	Stepwise Analysis					Partial F Analysis			Multiple	
	Variable	Beta	F	df	p	F	df	p	R	R^2
Step #1	Age	-1.22	10.8	1, 78	<.01	5.7	1, 74	<.05	.35	.12
Step #2	Intent Evaluation	- .31	4.2	1, 77	<.05	4.9	1, 74	<.05	.41	.17
Step #3	Egocentric Communication	+ .36	.9	1, 76	n.s.*	2.2	1, 74	n.s.	.43	.18
Step #4	Self-Behavior	+1.36	1.9	1, 75	n.s.	2.1	1, 74	n.s.	.45	.20
Step #5	Social Behavior	- .75	0	1, 74	n.s.	.5	1, 74	n.s.	.46	.21

Note: *n.s. - Not significant $p > .05$

TABLE 7

MULTIPLE REGRESSION ANALYSIS FOR THE DEPENDENT VARIABLE INTENT EVALUATION

	Stepwise Analysis					Partial F Analysis			Multiple	
	Variable	Beta	F	df	p	F	df	p	R	R^2
Step #1	Age	+.80	15.5	1, 78	$<.01$	3.7	1, 74	n.s.	.41	.17
Step #2	Egocentric Communication	+.43	4.3	1, 77	$<.05$	5.2	1, 74	$<.05$	.46	.21
Step #3	Outcome Evaluation	- .2	5.2	1, 76	$<.05$	4.9	1, 74	$<.05$	.51	.26
Step #4	Social Behavior	-.44	0	1, 75	n.s.*	.28	1, 74	n.s.	.51	.26
Step #5	Self-Behavior	-.15	0	1, 74	n.s.	.04	1, 74	n.s.	.51	.27

Note: *n.s. - Not significant $p > .05$

TABLE 8

MULTIPLE REGRESSION ANALYSIS FOR THE DEPENDENT VARIABLE EGOCENTRIC COMMUNICATION

	Stepwise Analysis					Partial F Analysis			Multiple	
	Variable	Beta	F	df	p	F	df	p	R	R^2
Step #1	Age	+.68	16.7	1, 78	<.01	8	1, 74	<.01	.42	.18
Step #2	Intent Evaluation	+.15	3.9	1, 77	n.s.*	5.2	1, 74	<.05	.47	.22
Step #3	Outcome Evaluation	+.08	2	1, 76	n.s.	2.2	1, 74	n.s.	.49	.24
Step #4	Social Behavior	+.65	1	1, 75	n.s.	1.8	1, 74	n.s.	.50	.25
Step #5	Self-Behavior	- .6	2	1, 74	n.s.	1.7	1, 74	n.s.	.51	.27

Note: *n.s. - Not significant $p > .05$

TABLE 9

MULTIPLE REGRESSION ANALYSIS FOR THE DEPENDENT VARIABLE SELF-COMPARATIVE ACHIEVEMENT BEHAVIOR

	Stepwise Analysis					Partial F Analysis			Multiple	
	Variable	Beta	F	df	p	F	df	p	R	R^2
Step #1	Social Behavior	+.26	3.64	1, 78	n.s.*	4.9	1, 74	<.05	.21	.04
Step #2	Outcome Evaluation	+.02	2.75	1, 77	n.s.	2.1	1, 74	n.s.	.28	.08
Step #3	Egocentric Communication	-.04	.9	1, 76	n.s.	1.7	1, 74	n.s.	.32	.10
Step #4	Age	+.02	1.9	1, 75	n.s.	4.9	1, 74	n.s.	.32	.10
Step #5	Intent Evaluation	0	0	1, 74	n.s.	.04	1, 74	n.s.	.32	.10

Note: *n.s. - Not significant $p > .05$

TABLE 10

MULTIPLE REGRESSION ANALYSIS FOR THE DEPENDENT VARIABLE
SOCIAL COMPARATIVE ACHIEVEMENT BEHAVIOR

	Stepwise Analsis					Partial F Analysis			Multiple	
	Variable	Beta	F	df	p	F	df	p	R	R^2
Step #1	Age	- .1	6.4	1, 78	<.05	2.6	1, 74	n.s.	.28	.08
Step #2	Self-Behavior	+.23	4.2	1, 77	<.05	4.9	1, 74	<.05	.35	.12
Step #3	Egocentric Communication	+.04	1.8	1, 76	n.s.*	1.8	1, 74	n.s.	.37	.14
Step #4	Outcome Evaluation	-.01	0	1, 75	n.s.	.5	1, 74	n.s.	.38	.14
Step #5	Intent Evaluation	-.01	0	1, 74	n.s.	.3	1, 74	n.s.	.38	.15

Note: *n.s. - Not significant $p > .05$

analysis, it may be hypothesized that the impact of a predictor variable is masked or inhibited by the other (especially significant) predictor variables in the test.

In the multiple regression posted in Table 6, age is found to be the primary predictor of outcome evaluation ($F = 10.8$, $df = 1, 78$, $p < .01$). Intent evaluation makes a significant contribution to predicting outcome evaluation when combined with age ($F = 4.16$, $df = 1, 77$, $p < .05$). The partial F analysis reiterates the power of age ($F = 5.7$, $df = 1, 74$, $p < .05$) as well as intent evaluation ($F = 4.9$, $df = 1, 75$, $p < .05$) in predicting outcome evaluation. Thus, it appears that changes in outcome evaluation are primarily predicted by chronological age and secondarily by intent evaluation. This relation is depicted in Figure 5.

Three significant predictors of intent evaluation are determined via the multiple regression. The primary predictor of this variable is age ($F = 15.5$, $df = 1, 78$, $p < .01$). Egocentric communication when combined with age enhances the prediction significantly ($F = 4.3$, $df = 1, 77$, $p < .05$). Outcome evaluation when combined with age and the communication variable again significantly enhances the predictions of intent evaluation ($F = 5.24$, $df = 1, 76$, $p < .05$) (See Figure 5 and Table 7).

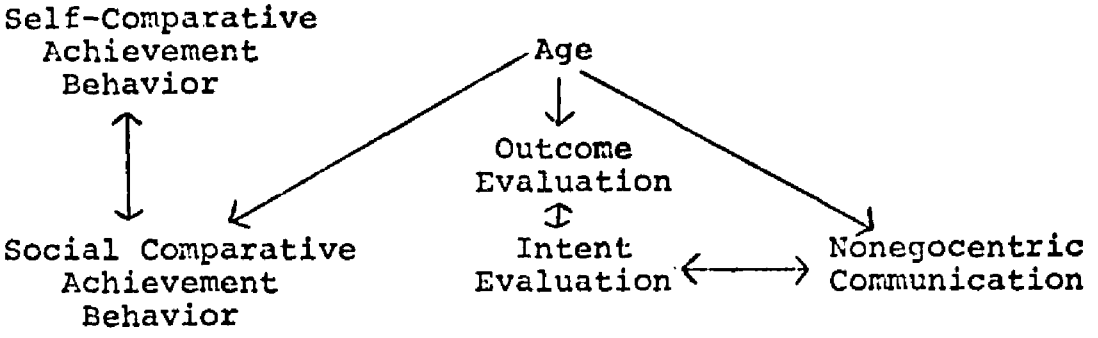
In a partial F analysis, only egocentric communication ($F = 5.2$, $df = 1, 74$, $p < .05$) and outcome evaluation ($F = 4.9$, $df = 1, 74$, $p < .05$) retain their pre-

dictive power. It may be hypothesized that the contribution of age to the prediction of intent evaluation is dependent on egocentric communication and outcome evaluation (See Figure 5).

When egocentric communication is the criterion variable, age is found to be the only significant predictor ($F = 16.7$, $df = 1, 78$, $p < .01$). However, in a partial F analysis, intent evaluation ($F = 5.2$, $df = 1, 74$, $p < .05$) as well as age ($F = 8.0$, $df = 1, 74$, $p < .01$) are found to predict the criterion variable. Thus, it may be hypothesized that the overwhelming importance of age overrides the predictive power and importance of intent evaluation in predicting communication style (See Figure 5 and Table 8).

FIGURE 5

THEORETICAL FACTORS AFFECTING THE DEVELOPMENT OF ACHIEVEMENT EVALUATION, EGOCENTRIC COMMUNICATION AND ACHIEVEMENT BEHAVIOR



Considering the data relating to the three cognitive factors the following conclusions can be drawn: 1) Age is a major predictor of outcome evaluation and mature non-egocentric communication. 2) Intent evaluation predicts and is predicted by the development of outcome evaluation and non-egocentric communication, and, 3) Neither of the behavioral variables are significant predictors of either outcome evaluation, intent evaluation or non-egocentric communication (See Figure 5).

The multiple regression when applied to the criterion variable self-comparative achievement behavior fails to identify any significant predictor variable. In this analysis, the single greatest predictor is social comparative achievement behavior ($F = 3.64$, $df = 1, 78$, $p > .05$). In the partial F analysis this variable is found to be a significant predictor ($F = 4.9$, $df = 1, 74$, $p < .05$). These results suggest that social comparative achievement behavior plays a secondary role in predicting the development of self-comparative achievement behavior for its effect only comes through when all other variables are controlled. In addition, the data indicate that the key predictor variables for this criterion variable have not yet been identified in this study (See Figure 5 and Table 9).

Finally, social comparative achievement behavior was considered a criterion variable. Results from the stepwise multiple regression indicate that the key predictor of this variable is age ($F = 6.4$, $df = 1, 78$, $p < .05$).

When self-comparative achievement behavior is combined with age, it significantly increases the prediction of the dependent variable ($F = 4.2$, $df = 1, 77$, $p < .05$). In the partial F analysis, self-comparative achievement behavior is the only predictor of social comparative achievement behavior ($R = 4.9$, $df = 1, 78$, $p < .05$). Therefore, when all variables are controlled, age no longer significantly predicts the criterion variable ($F = 2.6$, $df = 1, 74$, $p > .05$). Thus, it may be said that age primarily gains its predictive power through developmental changes in self-comparative achievement behavior (See Figure 5 and Table 10).

The data on the behavioral variables suggest the following: 1) The predictor variables of self-comparative achievement behavior have not as yet been identified. 2) Self and social comparative achievement behaviors predict each other's development. 3) Age is a major predictor of the development of social behavior, and, 4) The development of the behavioral variables is not predicted by the evaluative or communication variables (See Figure 5).

An additional set of findings which were unexpected must be mentioned at this time. Veroff's (1969) research indicates that social comparison achievement motivation is measured by the tendency of a child to select a moderately difficult task. The social comparison achievement behavior indicator measures this tendency. Unexpectedly, however, the social comparative achievement difficulty score, which denotes the tendency to select tasks varying from easy to

difficult, has significantly positive associations with intent evaluation and non-egocentric communication (r = +.35, $p < .01$; r = +.43, $p < .01$). It also has a significantly negative association with outcome evaluation (r = -.36, $p < .01$) (See Table ^).

The social comparison achievement behavior difficulty score's correlation with intent evaluation and the communication variable remain significant with age partialled out (r = +.26, $p < .05$; r = +.23, $p < .05$). The data suggest that these relations are a function of cognitive maturity. The relation between the social comparison difficulty score and outcome evaluation does not remain significant with age partialled out (r = -.18, $p > .05$) (See Table 5). The data suggest that this latter relation is probably a function of the dependence of both of these variables on chronological maturity.

IV. DISCUSSION

The present study replicates earlier work by Weiner and Peter (1973) on the development of achievement performance evaluation as well as Glucksberg and Krauss (1967) and Rubin (1973) on egocentric communication.

Specifically, the research supports Weiner and Peter's (1973) findings indicating that children under 9 years of age evaluate an achievement act primarily on the basis of outcome, while older children make greater use of the intention of the actor. The current study again indicated that an actor's ability is not a key developmental evaluative variable.

The developmental pattern identified by the earlier researchers for egocentric communication was again demonstrated. Younger children were found to speak egocentrically while the language of older children tended to be less egocentric.

The current work supports only portions of Veroff's (1969) research on achievement behavior. As Veroff indicated, self-comparative or autonomous achievement behavior tends to peak among 7-9 year olds and decrease in older children. But this nonlinear pattern was not significant. In addition, social comparison achievement behavior increases substantially in children 7-9 years old and remains stable, thereafter, through age 11.

As expected, social comparative achievement behavior tended to increase with chronological age. However, this

study failed to support Veroff's (1969) finding that self-comparative achievement behavior decreases with age. This occurred despite the fact that the basic methodologies in both studies were generally the same.

Another refutation of Veroff's (1969) results for self-comparative achievement behavior was obtained by McClintock and Moskowitz (unpublished paper). These researchers tested Veroff's (1969) motivational theory using two-choice decomposed games. In a two-choice decomposed game, each child is given a choice of two options, A or B. Each option specifies a payoff to self, a_1 vs. a_2 and to other, b_1 vs. b_2. It is assumed that in a given instance the child will select one of the two sets on the basis of a motivational tendency. In this setting, self-comparative or autonomous achievement motivated children are expected to act individualistically selecting an outcome where $a_1 > a_2$ or $a_2 > a_1$. On the other hand, social comparative achievement motivated children are expected to maximize their relative gain. This implies that an actor will choose A, if $a_1 - b_1$ is greater than $a_2 - b_2$ or B if the reverse obtains. Utilizing these procedures, McClintock and Moskowitz found no significant age related developmental changes in self-comparative achievement behavior.

The major purpose of the present research was to investigate the theoretical relations among achievement behavior, achievement evaluation and communication which are depicted in Figure 2. According to this model, changes

in achievement behavior were expected to be major determinants in the development of the evaluative and communicational variables. More specifically, based on Veroff's (1969) research, self-comparative achievement behavior was expected to parallel the maturation of social comparative achievement behavior. Self-comparison achievement behavior was expected to decrease along with outcome evaluation while nonegocentric communication increased. It could also have been anticipated that these associations may have been non-linear due to the curvilinear nature of autonomous achievement behavior. Finally, social comparative achievement behavior was expected to increase along with nonegocentric communication and intent evaluation. Although the correlational analysis supported most of the linear expectations in terms of their direction of association, none of the linear relations was found to be significant. And, the non-linear associations with autonomous achievement behavior were also found not to be significant.

There are a couple of possibilities that may account for the failure of the behavioral variables to demonstrate the expected associations. First, the variability of both social and self-comparative achievement behavior was limited, being based on measures with ranges of zero to three in each case. If more differentiated measures of these variables had been available, the impact of the behavioral factors might have been more clearly demonstrated.

Second, the behavioral variables may be unrelated to

the evaluative and communicational factors because they stress different dimensions. Veroff's (1969) measures may have certain cognitive elements but be primarily motivational indicators while the other variables appear to be more purely cognitive in nature.

Third, the failure to obtain the expected relations with the self-comparative achievement measure may be because it does not tap the dimension theorized by Veroff (1969). Research by Radin and Epstein (1975) raises the possibility that this measure may not, in fact, represent a motivational disposition. In their study, 4 year olds were administered Veroff's (1969) measure of autonomous achievement motivation as well as the Stanford-Binet Intelligence Scale. After the intelligence test was completed, but before an I.Q. was computed, the testers rated each child on the following: Attention, activity level, emotional dependence and problem solving behavior. These ratings were combined into a measure of motivational disposition. The Veroff (1969) measure was not significantly associated with the Binet derived motivational variables.

With regard to the social comparative achievement behavior measure, no comparisons with other motivational indicators have been obtained. The research that does exist suggests that in a two choice decomposed game with children in second to sixth grade, social comparative behavior increases with age (McClintock, 1974) providing tentative support for the validity of the measure.

Clearly, further research exploring the validity of the theorized motivational nature of Veroff's (1969) measures is needed.

If we accept Veroff's (1969) position that the self and social comparative behavioral measures tap achievement motivation, the strong positive correlation that was obtained between them may imply that they reflect the same achievement motivational disposition rather than two complementary dimensions as originally theorized.

However, if, as Radin and Epstein (1975) imply, self-comparative behavior is not an achievement motivational disposition, the strong positive correlation with social behavior suggests there is some other commonality. Perhaps, it is the game like behavior common to both measures. However, further work is needed to ferret out this commonality.

If the motivational basis or some other common factor is the reason for the positive association between Veroff's (1969) measures, a contaminating factor in the measurement technique may prevent the demonstration of a significant association. It is hypothesized that this contaminating factor is the cognitive requirement inherent in each of these tasks. For example, the self-comparative achievement task requires the child to perform and make judgments in highly concrete situations (i.e. select a bead pattern to duplicate). This type of task should be possible for children 5-11 years old to perform. For, as Piaget (1952)

indicates, children in this age bracket are in the concrete operational stage. Children in this stage can deal only with concrete objects and events. They can coordinate concrete characteristics in an actual situation but not possible characteristics in hypothetical situations.

The social comparative achievement task, on the other hand, requires the child to deal with abstract, hypothetical conditions (i.e. a puzzle "most boys your age can do"). The ability to handle hypothetical conditions is attained in adolescence in the formal operational stage according to Piaget (1952).

Interestingly, this latter hypothesis suggests that the positive association between age and social comparative behavior may be a function of the increasing maturation of motivation, as Veroff (1969) hypothesizes, or cognitive thought. Research factoring out each of these variables is required to understand the dynamics involved in the social comparative achievement behavior measure.

The data in this study, also, suggest an alternative theoretical model of the relation among achievement evaluation, communication and achievement behavior (See Figure 5).

As noted earlier, the data suggest that the behaviors tapped by Veroff's (1969) measures are not related to the evaluative and communicational variables. In addition, the variables of achievement evaluation and communication appear to form a cohesive interdependent cognitive unit. And,

virtually all variables studied are age related, although the developmental changes can occur independent of age as such.

Figure 5 depicts the theoretical model which is derived from the current study. The relations for the evaluative and communicational variables are specified as follows: 1) Outcome evaluation is predicted by age and intent evaluation. Correlational data indicate the former decreases while the latter two increase. 2) Intent evaluation is predicted by the development of outcome evaluation and language. Correlational data indicate that intent evaluation increases while outcome evaluation and egocentric communication diminish. 3) Nonegocentric communication is primarily predicted by age through its positive association. However, intent evaluation is also positively associated with language development.

Turning to the behavioral variables, the following relations are suggested: 1) The key predictor variables of self-comparative achievement behavior have not been identified. However, social comparative behavior appears to be a marginally positive predictor of its development. 2) Social comparative achievement behavior appears to be predicted by age development and self-comparative achievement behavior being positively correlated with both.

Thus, based on Piaget's (1932) work on morality, it was anticipated that communication, achievement evaluation and achievement behavior would be interrelated. The current

research failed to demonstrate such a unity. Instead, it is suggested that communication and evaluational processes may form an interdependent unit independent of achievement behavior.

The foregoing model presents the empirically suggested relations among the variables of achievement evaluation, communication and achievement behavior. Clearly, further research is required. Some areas of investigation which may be pursued and that were touched upon in other sections of this paper include:

1 - Determine the validity of self and social comparative achievement behavior as measures of achievement motivation.

2 - Determine the degree to which Veroff's (1969) procedures measure changes in cognitive maturity as opposed to motivation.

3 - Determine the common factor underlying self and social comparative behavior.

4 - Determine whether cognitive and motivational factors generally function independently or dependently.

5 - Determine the impact of utilizing more differentiated measures of self and social comparative achievement behavior.

APPENDIX A

Directions and Stories for the Achievement Performance Evaluation Task From Weiner and Peter (1973)

The younger subjects were told the following (with the experimenter elaborating any point when necessary):

> I am going to play a game with you, and in this game I am going to tell you about a boy. I want you to give either a gold or red star, whichever you think that the boy should get. Gold stars mean that you are pleased with the boy and that you want to reward him. Red stars mean that you are not pleased with the boy and you want to punish him. You can give either 1, 2, 3, 4 or 5 gold or red stars, depending on how much you think the child deserves. Five gold stars would be a big reward and 1 gold star would be a little reward, while 5 red stars would be a big punishment and 1 red star a small punishment. Do you understand all that?
>
> Now, let's practice a little. Bernie is a little boy who helped his mother with the dishes. What color star would you give him? How many stars? Bobby is a little boy who would not clean up his room. What color star would you give him? How many? Now I am going to tell you about some other children. These children are in school and the teacher has given them a picture puzzle to put together. This is the kind of puzzle in which you fit the pieces together. Each child is supposed to put his puzzle together before the bell rings. I'll tell you about each child and you give him either gold or red stars.

The wording of the instruction would be modified appropriately for older children. For all subjects, the instructions and the following stories were read aloud:

Paul is good at working puzzles. He is not trying to do this puzzle. He does not get it put together. What color star will you give Paul? How many?

Jerry is good at working puzzles. He is not trying to do this puzzle. He does get it put together. What color star will you give Jerry? How many?

Steven is good at working puzzles. He is trying to do this puzzle. He does not get it put together. What color star will you give Steven? How many?

Jonathan is good at working puzzles. He is trying to do this puzzle. He does get it put together. What color star will you give Jonathan? How many?

Michael is not good at working puzzles. He is trying to do this puzzle. He does not get it put together. What color star will you give Michael? How many?

Tim is not good at working puzzles. He is trying to do this puzzle. He does get it put together. What color star will you give Tim? How many?

Robert is not good at working puzzles. He is not trying to do this puzzle. He does not get it put together. What color star will you give Robert? How many?

Allen is not good at working puzzles. He is not trying to do this puzzle. He does get it put together. What color star will you give Allen? How many?

APPENDIX B

Directions for the Self-Comparison Achievement Behavior Tasks From Veroff (1969)

Beads

The next thing we are going to do is with these beads. You see they are all different colors. Also, they are different in other ways. Some of them are round (shows); this one has these funny lines like an accordion; and this one looks like a lantern. Now, we can put them together and make some different things out of them. This is the game: I'll show something put together already. You'll look at it carefully, because I'm going to hide it behind my back and then you'll make one just like it. And then, we'll see whether yours looks just like mine.

(Show item 1 - be sure the child's beads are not within his reach)

Look at this carefully. (After five seconds hide them behind your back.)

Now make one just like mine. (Offer child assortment of beads.)

(Wait until the child shows he is through. If there is any doubt about it, ask). Are you finished?

(Present the model and ask) Does yours look just like this one?

(If the child says yes or no too hastily, add) Look very carefully.

(Take the beads from the child, take his apart, and put them back into his box. Hide your own beads. Take the following string of beads and say) All right. Let's try this one.

(Every time the child is successful, follow with the next bead design. After the child has failed twice, show him the first item, the last success, the first failure and the second failure. Say) Now let's make one more string of the beads. You may try one of these things. Remember, this one was quite easy for you to do; this one was not so easy, but you got it right; this one was hard for you, and this one was very hard for you. Now, which one would you like to try again?

(After the child chooses let him try; then whether successful or not say cherrily) Okay.

Basket Throw

The next thing we'll do is one that many children in school like to play. You are to throw this ball into the basket from behind these lines. Let's start up real close to the basket.

(Bring the child behind the first line with his toes behind it.) Now try to get the ball in.

(When the ball does not go into the basket, just say) Okay (or) that's it.

(Point to the second line.) Now stand right here and try to get the ball in, etc.

(After the child has failed twice, take him away, aside from the line, and say) Stand away here and listen to what I have to say. Let's throw the ball once more. You may try from behind one of these lines. Remember, from here it was quite easy for you to get the ball in; this line was not so easy, but you got the ball in all right; from behind this line it was hard for you, and from here it was very hard for you. Now, from which of these lines would you like to try again?

(After the child chooses, let him try as before).

Picture Memory

Now let's play a different game. On the other side of each paper there are pictures of different things. When I turn the paper over, you look at the pictures carefully, and try to remember them because soon I am going to turn the paper so you can't see the pictures. Then you tell me what pictures you saw. Okay? Let's look at this paper first.

(Point to the pictures individually on the paper, say) This is a ...

(Let the child finish the sentence. If he hesitates, supply a name. After he has named all the objects, say) Now look carefully, because soon I'm going to turn the paper over.

(After five seconds do so.)

Now tell me what pictures you saw. (You may wish to write down the objects the child names. Let him have ample time to finish the recall. If there is any doubt about him being through, ask) Are you finished?

(Turn the card over for the child's evaluation and say noncommittally) Did you name all the pictures?

(If the child says yes to a card when he failed to name all the pictures, say) No, you did not name them all, because there is... and... and...

Okay. Now let's try this piece of paper, etc...

(After two failures show the child the first item, the last success, the first failure and the second failure. Say) Let's try one more of these again. Remember, these pictures were easy for you to remember; this paper was not so easy, but you got it right. This paper was hard for you, and this one was very hard for you. Which one would you like to try again?

(After the child chooses, let him try as before.)

APPENDIX C

Directions for the Social Comparison Achievement Behavior Tasks From Veroff (1969)

Here are three boxes (envelopes). They all look alike on the outside, don't they. Well, there's something inside for you to do. In this box there is something- How old are you? Four years old? Well, this is very easy for boys four years old.

In this box (middle) there is something that some boys four years old can do and some can't do.

In this box (last box), there is something that's hard for boys four years old to do.

You may do just one. Which one would you like to try? Remember this one is easy - this one some boys your age can do and some can't and this one is hard.

(Wait for answer and then give him the box he chooses with instructions for task.)

APPENDIX D

Directions and Figures for the Communicative Egocentrism Task From Rubin (1973)

The subject's cards would be turned face down in a single pile in front of him. The experimenter would say:

We are now going to play this game with shapes on cards. The idea of this game is for us to match as many of our cards together as possible. However, since I cannot see yours, the only way we can match them is if you tell me all you possibly can about each of your cards.

Communicative Egocentrism Figures

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