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ABSTRACT

Given the evidence that many women do pursue achievement successfully, the position that biology requires women to avoid success is unconvincing. Possible sources for the factors that generate avoidance of success include the influence of society, peers, and the family. In a search for sources of achieving behavior, 50 pairs of fathers and children, 26 with daughters and 24 with sons, were videotaped as they were engaged in working on three tasks: Raven Progressive Matrices, Blindfold-Building a Tower of Blocks, and Anagrams. Videotape records were subjected to content analysis. Factor analyzed variables successfully differentiated fathers' behavior towards boys and girls, with 6 of 12 variables in a discriminant function analysis being significant. Fathers demonstrated a close working relationship with boys, but not with girls, as indicated by latencies, kinds of criticism, and emphasis on reasoning. Academic achievement was significantly related to several aspects of fathers' behavior. (Author/JAC)

Videotaped Interactions between Fathers and Adolescent Boys or Girls as a Source for Achieving Behavior

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Abstract

In a search for sources of achieving behavior, 50 pairs of father and child, 26 with daughters, 24 with sons, were videotaped as they were engaged in working on three tasks: Raven Progressive Matrices, Blindfold-building a Tower of Blocks, and Anagrams. Videotape records were subjected to content analysis. Factor analyzed variables successfully differentiated fathers' behavior towards boys and girls (six of twelve variables in a discriminant function analysis were significant). As indicated by latencies, kinds of criticism, and emphasis on reasoning, fathers demonstrated a close working relation with boys, not with girls. Academic achievement was significantly related to several aspects of fathers' behavior.

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No society can flourish without a cadre of individuals devoted to solving problems, overcoming obstacles, achieving goals. Such individuals not only play a crucial part in the society's reaction to major crises, but also, day in and day out, devote themselves to coping with the innumerable difficulties which impede the normal functioning of a community.

Two prerequisites are necessary for the continued supply of individuals with high levels of need for achievement. Firstly, the way children are reared should encourage some of them to develop strong achievement motives. Secondly, the society must be so organized that children who develop such needs are given the opportunity to fulfill them.

Ideally, an open society should provide all infants with equal opportunity to develop both their talents and their achievement motives; and should provide a social setting favorable for the potentiation of both. Without such openness a society shrinks the available pool from which creative and productive individuals may arise and dooms many people to lives of routine repetitive labor, a loss both to the individual and the community. Unhappily, there have been few, or perhaps no such open societies. Most communities are so organized that through both methods of rearing and opportunities, some children are favored, others suppressed. The reasons for suppression vary; they include caste, class, "race," and, above all, sex.

Virtually all human societies studied by social scientists show a division of social roles into male and female categories (Rosaldo and Lamphere, 1974). With few exceptions the roles assigned to men have enjoyed higher status and greater rewards (Ortner, 1974; Rosaldo, 1974). It has been especially true in the Western societies whose roots are traced to the classical civilizations of Greece and Rome that women are assigned to the

life-maintaining labor of the household while men have engaged in self-enhancing craftsmanship and in the kind of social action in the "respublica" which leads to enduring reputation (Arendt, 1958).

Contemporary Western society is attempting to depart from this stereotyped assignment of social roles and the associated devaluation of women. We have committed ourselves, both through law and through the arousal of expectations, to the notion that women can play a role equal to men in the social system and can carry out all the functions which had previously been reserved to men. And so we see women completing training as jet pilots in the U. S. Air Force and filling a large number of places in medical and law schools. Yet all the evidence of research points to a crippling inability on the part of many women to view themselves and other women as being genuinely equal to men (Parsons, Ruble, Hodges, and Small, 1976; Broverman, Vogel, Broverman, Clarkson, and Rosenkrantz, 1972; Stein and Bailey, 1973; Bem, 1970; Deaux and Emswiller, 1974). Somewhere in the process of socialization women learn, as the Bems put it to "know their place" (Bem, 1970). They attribute their successes to luck or hard work rather than talent (Feather, 1969; Feather and Simon, 1975; Frieze, 1975), and their failures to lack of innate ability (Crandall, Katkovsky, and Crandall, 1965; Parsons and Heim, 1975). There are, of course, many women among whom this pattern does not occur, but for many other women the need to avoid success, so vividly described by Horner (1970, 1972, 1974) leads to an inability to fulfill potential which is crippling to the individual and a source of immeasurable loss to society.

It may be appropriate to question whether, at the close of a decade of the women's movement and of affirmative action, the trends described in the previous paragraph are still current. There has certainly been little success in replicating Horner's original finding that imagery purportedly

reflecting motive to avoid success is much more frequently given by girls than boys (Zuckerman and Wheeler, 1975; Tresemer, 1977). Indeed, attempts to replicate the behavioral findings reported by Horner have also failed (Romer, 1975, 1977). Moreoever, women, especially young women, are now more likely than a generation ago to report egalitarian attitudes towards sex-roles (Thornton and Freedman, 1978; Herzog and Bachman, 1982). Suchner (1979) has described a failure to replicate sexist biases in the prestige of occupations. And Newman and Newman (1979) summarize a variety of studies which argue that the seventies have seen a shift towards verbally expressed attitudes rejecting limitations on women's roles.

Most of the evidence showing change deals with what people <u>say</u>. Evidence about what they do is harder to find. The marked increase in the proportion of women in medical and law school is an indicator of real change. Affirmative action officers report that a very large proportion of women at work, perhaps as many as half, are reluctant to try to move into managerial or technical jobs for which they are qualified (Farley, 1979). Laboratory studies by the writer and others continue to demonstrate behavioral avoidance of success, even where this is not accompanied by consonant verbal expressions (Morgan and Mausner, 1973; Mausner and Coles, 1978; Mausner and Cubit, 1979). Finally, assessment of the roles of women in countries in which the official ideology is strongly egalitarian indicates that the reality is one of profound segregation of women into traditional areas of work or into the home; this is true both of Israel and of the Soviet Union (Defronzo, 1979; Brandow, 1979).

A search for the origins of a tendency among women to avoid success requires answers to two questions. The first is the question of the mechanism by which this tendency is acquired. The second is the question

of the age(s) during which the tendency is first manifested. Parenthetically, these questions are based on the hypothesis that the tendency is learned. An alternative hypothesis is that avoidance of success is a "wired-in" behavioral pattern based on some genetic characteristic associated with XX chromosomes. Given the evidence that many women do pursue achievement successfully, the proposition that biology requires the destiny of avoidance of success is unconvincing to the writers and, indeed, to most social scientists.

There are a number of possible sources for the influences that generate avoidance of success, and it would be simplistic to argue that any one is wholly responsible. Three major areas which may be identified are the influence of society at large, the influence of peers, and the influence of the immediate family. The research being reported here centers on the third area.

Parental shaping of sex roles in the early years of development has been studied intensively (Weitz, 1977, provides a good summary of this literature, as do Stein and Bailey, 1973). The father seems especially important in the development of achievement orientation; as Talcott Parsons suggested in his well-known discussion of the development of sex roles (1955), fathers are more concerned than mothers in differentiating the behavior considered appropriate to each sex. And the relationship between father and mother provides a model to the child of the reactions to be expected to feminine behavior (Biller and Weiss, 1970). However, the writers have not been able to find in an examination of the literature on the role of fathers in development any evidence that fathers foster avoidance of success through their behavior towards infants (Lynn, 1974; Biller, 1971; Lamb, 1981; or young children (Radin, 1975; Radin and Epstein, 1975; Hoffman, 1977; Pedersen, 1980).

In contrast, there does seem to be some evidence that encouragement from a father is responsible for the development of achievement orientation and for the choice of demanding and fulfilling occupations among both boys and girls of grade school age (Bell, 1969; Johnson, 1963; Dielman, Barton, and Cottell, 1973; Mickleson, 1976). Mothers do seem to be an important influence on the acquisition of achievement orientation among boys, especially during early childhood (Crandall, 1963), but, paradoxically, not for girls. There is, however, some evidence that working mothers provide role models for girls. Still, as Johnson demonstrates (1963), mothers are primarily devoted to the teaching of expressive behavior; it is fathers who teach instrumental behavior.

While there is abundant evidence that the content of female sex roles is learned early in life, perhaps as early as the second or third year, there is little indication that avoidance of success per se is a subject of early indoctrination. Girls often outperform boys in a variety of areas in which they compete, both in the pre-school and the primary years. Developmental studies show both fathers and mothers encouraging girls to do well in school during this period (Katovsky, Crandall, and Good, 1967; Maccoby and Jacklin, 1974). It is well known that the early superiority of girls in school begins to diminish during the early years of high school (Shaw and McCuen, 1960; Kagan, 1964; Maccoby, 1966; Macobby and Jacklin, 1974). As puberty progresses girls must develop a growing awareness of the social position of women, must be exposed to denigration of things female, and, most seriously, must be made aware of the dangers they face if they try to break into the male world. It is significant that parents tend to value academic success in primary age children, but do not relate success among girls to future careers, as they do among boys (Parsons, Ruble, Hodges, and Small, 1976). Parsons et al. cite voluminous

evidence to demonstrate that differences in expectancy of success do not emerge during the early school years, but that as school progresses both boys and girls learn that women are weak and unreliable, men strong and reliable. Along with this goes the daily lesson given to outstanding girls that women who threaten men go unloved. On the basis of these considerations, this research was planned to investigate the period immediately before and during puberty on the ground that the influence which leads to the drop in girls' performance in school during high school and college probably originates then.

It may be hypothesized, then, that the critical period for the acquisition of a tendency to avoid success is the span of years immediately before and after puberty. We may hypothesize further that young women reach this period with a range of need for achievement not very different from that found among young men. Maccoby and Jacklin (1974) summarize early findings to this effect; more recent data have been reported for Scandinavia (Vollmer, 1974) and the United States (Kivetz, 1976). The performance of young women falls off after this period, relative to ability. We have evidence that need for achievement predicts achievement oriented behavior among boys in high school, but not among girls (Bell, 1969; Moss and Kagan, 1961; Crandall, 1963; Sears, cited by Crandall, 1963; Winterbottom, 1958; and the long range follow up of Winterbottom's study conducted by Feld, 1967). A further poignant reminder of the force of the factors inhibiting women's ability to act on their needs for achievement is Coleman's report that girls, unlike boys, did not want to be remembered as good scholars in their high schools (1961).

Atkinson's model for achievement-oriented behavior (Atkinson, 1974) may be a useful way of conceptualizing the relation between achievement needs and actual behavior. This model describes the tendency to strive towards success as based on three factors; an internal disposition

equivalent to McClelland's need for achievement, the expectation that a particular kind of behavior would lead to success, and the incentive value of that success. The tendency to strive towards a particular success is diminished by fear of failure, which is based on a multiplicative function of a general disposition to avoid failure, expectation that a particular choice would lead to failure, and the negative incentive value of the particular failure. We should remember that need for achievement taps general dispositions that are appropriately aroused among men by circumstances, and that predict achievement-oriented behavior among males but not among females (Winterbottom, 1958; Moss and Kagan, 1961; Feld, 1967, for evidence of predictive relation among boys; Sears, 1963, for its failure among girls).

If girls and boys do, indeed, arrive at puberty with the same range of general dispositions towards achievement, then the differences between them in achievement must arise from differences in the incentives attached to achievement and in the expectation that these incentives would be gained by striving (Veroff, 1965; Parsons and Ruble, 1977). It is the major thesis of the current research that the differences in incentives for achievement and in expectations are established by differences in experiences among girls and boys in the years immediately before and after puberty. It is then that the incentive for many achievements is lowered for many women by the failure of significant others to provide appropriate rewards and by the subtle but intense punishments the achieving young woman often receives. To complicate things, the very expectation of success is reduced (Veroff, 1965). Thus, boys work harder when they fail, while girls do not (Nicholls, 1975).

In summary, the hypothesis tested here is that reactions by significant others to striving for success are markedly different for boys and girls, that these differences promote differences in the incentive value of success and in expectations of the probability of success, and that these differences lead to a failure on the part of women to potentiate their talent through achievement-oriented behavior. (For a good statement of the support for this thesis, see Nieva and Gutek, pp. 93-103.) A highly important "significant other" is the father, although a part in this process may be played by other family members (mother, grandparents, siblings), peers, teachers, the acculturating factors in the society at large.

Research strategy. The goal is to determine the experiences of pre-adolescent boys and girls which affect incentive values and expectancies concerning success in achievement-oriented behavior. These values and expectancies, presumably, may be related to the actual occurrence of such behavior subsequently. Ideally, one would be able to study all sources of influence on values and expectancies, demonstrate actual levels of subjective expected utilities (i. e., the product of values and expectancies), and then show the impact of these utilities on achievement-oriented behavior relative to ability.

Such a strategy faces many problems. It has become clear from the literature and from pilot studies that verbalizations are a poor source of information about utilities. They are much too contaminated by social acceptance value of quasi-feminist ideas. Thus the usual strategy of the social psychologist, which is to obtain measures of attitudes, is of little value. Further, it would be desirable to study all possible sources of influence, i. e. peers, teachers and other authority figures, the mass media, parents and other family members. However, to carry out observational studies of such a wide range of sources for each subject in a study would

be almost entirely impracticable.

The decision was taken, therefore, to limit the research to the study of fathers' influence and to focus on the age group in which the most significant effects of this influence might be expected to manifest themselves. Further, it was decided to observe actual interactions rather than use attitudinal measures or retrospective accounts as primary data. These observations could, of course, be supplemented by verbal materials derived from interviews and questionnaires. A series of unpublished pilot studies was carried out by students at Beaver College (reference note 1). Trentalange and Mausner developed a pattern for these studies in which fathers, in their homes, were asked to work with an adolescent son or daughter on the solution of the Raven Matrices. Interactions were observed and coded using a modification of the schedules developed by Hermans, Terlak, and Maes (1972) and Loeb, Horst, and Horton (1977). Although the observers reported that differences between fathers' behaviors towards boys and girls were evident, the coded observations failed to demonstrate them. Freeman and Lavay replicated the study, using videotape to record the interactions. Although the sample recorded was too small for adequate analysis, the practicability of the technique was demonstrated. The current study was planned as a pilot for a larger research in which 100 families would be visited and father-child interactions recorded. The present report represents work-in-progress. That is, 50 families were studied and the interactions between father and adolescent analyzed. However, long-range follow-up is not as yet available. Still, the results to be presented below seemed sufficiently interesting to merit reporting at this time.

Research questions. Since this study is preliminary to a larger effort, the basis of the study should not be defined as a series of rigorous hypotheses, but rather as a set of exploratory questions.

1. Is the technique of videotaping interactions in the home a practicable one? To answer this it will be necessary not only to find a group of fathers and their children willing to be videotaped but also to assess in some way the artificiality of the resulting behavior. Whether quantitative answers to this question can be obtained is problematic. However, the results of the series of fifty visits to families should provide tentative answers.

2. Does the behavior of fathers differ towards sons and daughters? To answer this question a reliable coding scheme for the interactions would be needed, data reduction would be required to move from the count of a large number of specific behaviors, both verbal and non-verbal, to a manageable set of variables. This data reduction would best be done through factor analysis. Lastly, discriminant analysis would be needed to answer the question quantitatively.

More specifically, there should be a search for particular kinds of father-child interactions which, on theoretical grounds, might be considered to be important as determinants of achieving behavior, and thus might be expected to show sex differences. Among these would be the patterns of reward for success and punishment for failure. Hoffman (in Mednick, Tangri, and Hoffman, 1975) suggests that at an early age boys are task oriented, confident, respond to feedback cues from successes and failures, try harder after failure. Girls, on the other hand, work for approval, are less responsive to feedback from success, are less task-oriented than boys. It will be important to determine whether these early patterns persist in the age groups studied here.

3. What age provides the most fruitful field for investigation of the sources of achieving behavior. Given limited resources and the complexity of the factors being studied, it was decided to limit the major study of

100 families to one age group. In the study being reported here, three age groups were used, sixth, eighth, and tenth grades. The first of these is just before the period of puberty, although some children will begin to show signs of biological maturation (girls more likely than boys). Eighth grade is in the middle of the period in which Erikson suggests that problems of identity are paramount. By tenth grade the patterns of father-child interaction should be fairly well set. Examination of trends across age was necessary for the choice of the age to be studied in subsequent investigations.

4. Although the demonstration of sex differences in father-adolescent interaction would in itself be of theoretical interest, such a demonstration would not be unassailable evidence that these differences are in actuality sources of differences in achieving behavior. Furthermore, it is possible that important influences on achieving behavior could be demonstrated within each group as well as between the groups of boys and girls. Therefore, the following question is necessary: Are father-adolescent interactions predictive of actual achieving behavior? A limited amount of objective data in the form of school grades and performances on standardized tests are now available; further data of this kind will be sought as well as records of participation in extra-curricular activities, civic activities, choice of curricula and, eventually, choice of further education and of career.

Lastly, are the interactions observed during the limited period of observation characteristic of those in the normal life of the father and child? While no observational data are available to answer this, a limited test is available from a questionnaire and interview completed by the adolescent and both father and mother. Retrospective data concerning child rearing methods, discipline, and values, as well as aspirations for

further education and for careers were obtained. In addition, reports were requested on choice of school subjects, participation in activities, and patterns of study.

Procedure

Subjects. The subject pool consisted of students in the sixth, eighth and tenth grades of the Cheltenham school district and their fathers. The parents' associations of the schools in which these children were registered cooperated by furnishing the project with class lists; these included addresses and telephone numbers of the students. Parents' association officials and school counselors further assisted by identifying children with known academic problems. Other families were considered inappropriate because of the lack of a father living at home. A small proportion could not be reached. The pool consisted of 298 families. Cheltenham school district borders on Philadelphia, and is a prosperous, predominantly white, middle-class area in which most families live in single-family houses. The schools have high academic standards, and a high proportion of the children are bound for college.

Letters were sent to all parents in the pool describing the project as one designed "to study the father's part in adolescent development." Telephone contacts were made with 247 families to set up home visits by the research team in which the child and both parents would be available for participation in the work of the project. One hundred ninety families refused to participate. The families were offered a donation of $10.00 to the parents' association as a reward for participation. Complete anonymity was assured, and an informed consent statement was signed by the participants. The final subject population consisted of 26 girls and 24 boys with their fathers and mothers, evenly divided among the three grades (Table 1).

Table 1

Father Project

Record of Letters Sent to Prospective Subjects,

Phone Calls, and Appointments

Cheltenham	# Letters Sent	No Phone, Moved, etc.	Did Not Phone	Calls Completed	"No"	Appt. Made	Appt. Broken	Final Tapes
Boys								
6th gr.	55	9	0	46	37	9	1	8
8th gr.	64	10	0	54	46	8	0	8
10th gr.	52	4	10	38	28	10	2	8
Girls								
6th gr.	22	3	3	16	8	8	0	8
8th gr.	42	2	0	40	28	12	2	10
10th gr.	63	10	0	53	43	10	2	8
Totals	298	38	13	247	190	57	7	50

The testing session. A team of two investigators visited each home. Their equipment consisted of a Panasonic portable color Video Cassette recorder and camera, and an electrovoice microphone. A table was found, usually in a kitchen, den or dining area, on which the tasks could be carried out. The father and child were positioned so that lighting from lamps or windows would fall frontally on the pair and on the table. The camera was set unobtrusively in the corner of the room, and lighting and sound levels were tested.

Father and child were then informed that the project was interested in studying "how fathers help their children deal with an unfamiliar task." Fathers were told that they could help in any way they saw fit. Father, child and mother were also told that an individual interview would be completed as part of the project. At this point one of the team members withdrew to another room to interview the mother (for content of the interviews see below).

The tasks. Three tasks were selected for the project. They were chosen to provide different kinds of settings in which interaction between father and child could be observed.

The first task was the Raven Progressive Matrices. Twenty-one Raven Matrices were selected, nine from the "easy" set and eleven from the "difficult" or advanced set. It was hoped that this group of matrices would provide experiences of both success and failure. A very easy matrix was demonstrated to the subjects as an illustration of the task. The pair was given instructions to take "as much time as you like" for the set of matrices. The father was furnished with an answer key.

The second task was block-building. The child was instructed to build a tower with a set of odd-shaped blocks on a fairly large base and to work blindfolded. Six minutes were allotted for the task; a timer was in the

father's view. A second part of the task consisted of the building of a tower with the same blocks on a narrower base and with one hand. Ten minutes were allotted.

The third task was a set of anagrams. The child was given six letters and asked to make as many words of three or more letters as possible in a five-minute period. The father was given three extra letters and told that he could decide when to give these to his child.

Interview. The interview for both parents and child consisted of the following material:

1. Questions concerning educational and vocational aspirations.
2. Questions concerning choice of curriculum, especially elective subjects, and attitudes towards schoolwork.
3. Questions concerning participation in extra-curricular activities, participation in civic, athletic or artistic functions, study habits. Parents' participation was also queried.
4. Questions concerning patterns of child-rearing derived from the Cornell Parent Behavior Description (Siegelman, 1965).
5. Parents were asked questions to permit an estimate of the child's level of physical maturity, such as body hair and development of breasts.

Coding. The videotapes were coded by observers who were familiar in a general way with the object of the study. Two coding systems were used. One dealt with verbal behavior and recorded general orientation of father or child to the task, requests for assistance or offers of assistance, reactions to the task, discussions of reasons for the answers with references either to general strategy or to specific correct or incorrect answers, reinforcements, praise, criticism, indications of tension or

Attempts to reduce tension, simultaneous talk or interruption. The second dealt with non-verbal behavior and included estimates of shoulder-to-shoulder distance recorded at the start of each minute, eye contact, non-verbal indications of feeling, touching, father's handling of the blocks or anagram letters. Details of the coding scheme are evident in the factor analyses reported below. The tapes were independently coded by two observers. Intercoder reliability using the Wright (1967) formula was 96% for the non-verbal behaviors and 80% of the verbal behaviors.

Results

After partial correlations for grade and for total number of codable interactions were computed, SPSS factor analyses with Varimax Rotation were carried out on the coded interactions separately for each task (Nie, Hull, Jenkins, Steinbrenner and Bent, 1975). In each a factor structure with four factors was selected which accommodated most of the father/child behavior. For the father's behavior on the Raven Task (Table 2), 30 variables out of 42 had loadings over .40 on one of the factors; the proportion of variance accounted for was 40%. For the Block Task (Table 3), 23 variables out of the 39 had loadings over .40 on the factors; the proportion of variance accounted for was 34%. For the Anagram Task 29 of the 42 variables gave four factors accounting for 45% of the variance (Table 4).

Father Behavior

Raven Factor I. The first factor extracted on the Raven Task represents a close working relationship between father and child. The father took time to discuss the problems and reach an agreement with the child on the solution. He continued to question child's reasoning after the solution was reached. There were disagreements before solution was reached but resolved when problems were solved.

Raven Factor II. This describes the father's reinforcing behavior as he praises the child and the performance. He gives encouragement as well as direction.

Raven Factor III. The father takes time before intervening with the correct answer. He indicates to the child that the problem is difficult when problem is incorrect. He attempts to orient the child but disagrees after the child gives solution and indicates that problem should be given up on.

Raven Factor IV. The father engages in competing behavior; criticizes child's approach to task; checks answer key and indicates a need for help.

Block Factor I. The most prominent behavior of fathers on the Block Task included interrupting the child, moving the blocks after initial placement by the child or by offering to help. The father, usually tense or anxious, was, however, very much physically involved in working together with the adolescent.

Block Factor II. This includes the father's reinforcing behavior after failure, i. e. when the tower or a part of it fell. The father usually issued a warning beforehand, and praised replacement of the blocks as the child began rebuilding the tower. The father would take his eyes off the task during this time but was generally patient with the child's attempt to rebuild the tower.

Block Factor III. This factor deals with the father's criticism of the child's approach to the task with the father giving a great deal of physical help. The father took charge and most often placed the block in the child's hand directly or grouped blocks in tray so child could pick out proper block or put a block he had selected beside the child. The more help the father gave, the less he directed and suggested verbally. The prominent behavior in the factor is the father's critical attitude toward the child's approach to the task.

Block Factor IV. This represents a supportive relationship between father and child. Prominent in this factor was the father's lack of criticism of the child. The father gave many directions and suggestions to the

child while helping simultaneously. However, there was little opportunity for the father to accept the child's suggestions during this situation.

Anagram Factor I. This describes the father's reinforcing behavior in which he encourages and praises child's approach to the task. He disagrees when word is unacceptable, and gives clues to the correct word. Father expresses a dislike of task but laughs and offers child help.

Anagram Factor II. This includes father's acceptance of child's suggestions but he does interrupt the child often. He asks questions, suggests a letter to the child, orients to refocus attention to the task and gives general and specific information.

Anagram Factor III. This describes the father's critical attitude toward the child, his concern with the time he/she takes to do the task, moves letters around for the child, and shows that he is tense during this time.

Anagram Factor IV. This describes a supportive relationship between father and child in that they often look at each other, and sit close together. The father may ask for clarification but does not give the child specific directions. The father does check the word list often however.

Table 2

Summary of Factor Analyses of Father's Behavior

Raven Task

Factor I	16.4%	Loading
Latency to first solution		.83
Agreement before solution		.81
Questions child's reasoning after solution		.74
Latency to correct solution		.71
Gives specific reasoning		.71
Total latency		.70
Agreement after solution		.64
Disagreement before solution		.64
Points to figure		.47
Points to answer		.41
Leans toward task		.41
Gives general reasoning		.41
Factor II	**8.5%**	
Praises performance		.76
Gives general directions		.67
Gives encouragement		.59
Praises child		.56
Gives specific directions		.47
Factor III	**8.3%**	
Total correct solutions		.78
Latency to first response		-.66
Total answers		.60
Total problems on first response		.55
States that problem is hard		.51
States that solution is correct		-.51
Orients		.48
Disagreement after solution		.46
States that child should give up on problem		.42
Factor IV	**6.4%**	
Asks for help		.57
Compares performance with child's		.57
Criticizes child's approach		.55
Looks at answer key		.47

Table 3

Summary of Factor Analyses of Father's Behavior

Block Task

Factor I	10.3% +	Loading
Interrupts		.69
Moves block after initial placement		.55
Physically helps		.50
Offers help		.44
Reacts to end of task		.44
Displays physical tension		.43
Disagrees		.42
Indicates verbal anxiety		.42
Factor II	**8.8%**	
Reinforces (other than praise)		.73
Directs choice of block		.59
Issues warning to slow down		.59
Tower falls		.56
Frowns		.40
Praises replacement of block		.40
Factor III	**7.7%**	
Puts block in child's hand		.71
Chooses block for child		.61
Criticizes child's approach to task		.61
Directs and suggests		-.58
Places block near child		.43
Factor IV	**7.2%**	
Directs, suggests and physically helps		.74
Criticizes child		-.72
Directs and suggests initial placement of block		.59
Physically helps (without suggestions)		-.51
Agrees, accepts		-.46

+ per cent of variance

Table 4

Summary of Factor Analyses of Father's Behavior

Anagram Task

Factor I	17.1% +	Loading
Encourages use of word		.83
Praises use of word		.71
Expresses dislike of task		.66
Gives clues		.64
Laughs		.55
Indicates word unacceptable		.54
Disagrees		.46
Offers help		.45
Factor II	**9.9%**	
Agrees, accepts child's suggestion		.71
Interrupts		.71
Asks questions		.62
Mentions a letter		.56
Simultaneous talk		.55
Gives specific suggestions		.54
Gives general suggestions		.46
Gives general information		.45
Orients		.41
Factor III	**9.3%**	
Criticizes child		.72
Concerned about time		.59
Reacts to end of task		.55
Moves letters around		.50
Shows physical tension		.49
Gives the first response		.41
Factor IV	**8.4%**	
Father looks at child		.62
Shoulder to shoulder proximity		.61
Asks for clarification		.48
Gives specific directions		-.48
Looks at word list		.44

+ per cent of variance

Child Behavior

For the child's behavior on the tasks four factors were extracted to account for the variance in behavior. For the Raven Task 27 variables accounted for 42% of the variance (Table 5). For the Block Task 23 variables accounted for 42% of the variance (Table 6). The Anagram Task included 26 variables which accounted for 43% of the variance (Table 7).

Raven Task Factor 1. The child took time to reach a solution, engaged in specific reasoning and agreement of answer with father. The adolescent praised the father, engaged in orienting behavior and agreed with the father after a solution was reached.

Raven Factor II. This describes the child giving specific directions, disagreeing and interrupting the father, asking for help and praising approach to the problem, interrupting the father, asking for help and praising father's solution to problem. The child indicates that the problem is difficult and questions the father's reasoning about the solution.

Raven Factor III. This assesses the child's attention and reaction to the task. The child is critical of the father but agrees with him after solution is reached.

Raven Factor IV. The child engages in a great deal of laughter, and is quick to give the first response to the task. The child refuses help from the father but does engage in general reasoning and direction and simultaneous talk.

Block Task Factor I. This describes the father and child working together on the task with close shoulder-to-shoulder proximity. The child predominately refused father's help and issued directions and suggestions to the father and did not comply with his suggestions. The child praised the approach to the task but when child decided to give up on task the father was asked for help.

Block Factor II. The adolescent worked alone, feeling the block, touching the tower, removing and choosing the blocks with little direction from the father. The adolescent was low on compliance on this factor.

Block Factor III. The adolescent displayed a reaction to the end of the task indicating relief at task's end. The child engaged in little directing or suggesting.

Block Factor IV. The child primarily criticized the father, moving the blocks independently, orienting and warning the father to slow down. The child did accept the father's suggestions on block placement.

Anagram Task Factor I. The most prominent behavior of the child involved general reasoning. Father and child did engage in simultaneous talk. The child did ask for help and checked with father to determine acceptability of a specific word.

Anagram Factor II. The child predominately mentions a letter that would be useful to have but is not available. The child laughs, questions father's reasoning, reacts to end of task, and indicates a desire to give up although quick to make up first word.

Anagram Factor III. This represents a close working relationship with father and child agreeing, making a great number of words, smiling, and child praising father's approach and solution.

Anagram Factor IV. This describes the child looking at father, asking for help, making a nigh number of acceptable words while refusing father's help.

Table 5

Summary of Factor Analyses of Child's Behavior

Raven Task

Factor I	20.9%+	Loading
Latency to first solution		.79
Gives specific reasoning		.78
Agrees before solution is reached		.70
Praises father		.61
Orients		.54
Agrees after solution is reached		.49
Factor II	8.5%	
Gives specific direction		.78
Disagrees		.77
Asks for help		.76
Interrupts		.72
Praises approach		.65
Indicates problem is hard		.54
Questions father's reasoning		.52
Factor III	7.7%	
Eyes off task		.79
Criticizes father		.78
Disagrees after solution is reached		.75
Displays positive reaction to task		.70
Points at problem		.51
Looks at father		.43
Factor IV	6.6%	
Laughs		.65
Praises solution		.59
Gives general direction		.58
Refuses help		.55
Exchanges information		.54
Engages in general reasoning		.50
Engages in simultaneous talk		.48
Latency to first response		-.43

+per cent of variance

Table 6

Summary of Factor Analyses of Child's Behavior

Block Task

Factor I	14.9%+	Loading
Refuses help		.80
Directs and suggests		.77
Indicates verbal anxiety		.70
Shoulder to shoulder proximity		.60
Interrupts		.60
Reasoning		.53
Praises approach		.53
Non-compliance with suggestion		.46
Asks for help		.45
Indicates desire to give up		.43
Asks question		.41
Factor II	12.7%	
Feels block		.83
Touches tower		.78
Removes block		.74
Chooses block		.71
Indicates compliance		-.63
Places block (without direction)		.59
Factor III	7.8%	
Reacts to end of task		.74
Directs and suggests block placement		-.43
Factor IV	7.6%	
Criticizes father		.60
Moves block		.55
Orients		.51
Issues warning to slow down		.48

+per cent of variance

Table 7

Summary of Factor Analyses of Child's Behavior

Anagram Task

Factor I	17.1%+	Loading
Reasoning		.69
Simultaneous talk		.66
Engages in negative remarks		.57
Gives general suggestion		.57
Criticizes approach		.52
Asks for help		.52
Asks if word acceptable		.48
Gives specific and general direction		.48
Criticizes father		.43
Orients		.43
Disagrees		.40
Factor II	**9.9%**	
Mentions a letter not available		.89
Laughs		.73
Questions father's reasoning		.66
Reacts to end of task		.66
Indicates desire to give up		.56
Latency to first word		-.43
Factor III	**9.3%**	
Shoulder to shoulder proximity		.82
Agrees		.77
Total words made		.75
Smile		.51
Praises father's approach and solution		.48
Factor IV	**8.4%**	
Total acceptable words		.97
Looks at father		.71
Asks for help		.57
Refuses help		.45

+per cent of variance

Discriminant Analysis

Factor scores on each of the 12 factors for the three tasks were computed for father and child. Separate discriminant analyses for the father and child with sex of the child as the dependent variable were computed using the Wilks Stepwise method (Nie et al, 1975).

For the father's behavior six of the 12 factors discriminated significantly (Table 8). The standardized discriminant function indicated the weight contributed by each factor in the analyses. Fathers of girls used more reinforcement and praise on the Block task (Factor II) and were generally more helpful and non-critical of the girls (Factor IV) or the Block task. On the Raven task fathers of boys were critical (Factor IV).

The fathers of boys ranked higher on factors where criticism and helping were involved (Factor III on the Block and Anagram tasks). On the Raven task (Factor I) fathers of boys allowed them more time to work out the problems and engaged in general reasoning.

For the child's behavior on the three tasks eight of the 12 factors discriminated significantly (Table 9). On the Raven task boys worked longer than girls to reach the first solution, reasoned and agreed on the correct solution and praised the father (Factor I). While on Factor III girls criticized the father and disagreed on the solution to the problem. Boys scored higher on the Block Task (Factor I) showing independence in refusing father's help, and directing and suggesting an approach to the father. Sons criticized fathers more on this task (Factor IV).

On Factor I the boys reasoned out the task, asked for help, criticized the father and his approach to the task. The girls scored higher on two of the Anagram factors (III and IV). On Factor III they sat closer to the father, smiled more and praised father's approach and solution. On Factor IV

There was ambivalence on the part of the daughter in regard to the father's help on the task.

The success of the discriminant function in differentiating the fathers' behavior towards boys and towards girls is indicated in the Classification table (Table 10). It can be seen that fathers are very consistant in their behavior towards boys; relatively few of the fathers of boys are misclassified. In contrast there is a somewhat higher proportion of fathers who treat their girls as if they were boys. This discriminant function for the child's behavior showed an equivalent number of boys and girls correctly classified.

Four factors on interview data from the father were used in a discriminant analysis with sex as the group variable. One factor accounting for 24% of the variance was found to discriminate significantly between fathers of boys and fathers of girls (p .05). Fathers of boys had higher educational expectations, career aspirations and estimate of probability of success for their child than fathers of girls. From father's aspirations for child 79% of the boys were correctly classified while only 54% of the girls were correctly classified.

Achievement of Child

Two way Analysis of Variance (Table 11) demonstrates an interaction effect for boys who are low in achievement. They are treated by fathers uncritically (i.e., in terms of the discriminant analysis; Factor II on the Block and Anagram Task involved critical help, and fathers of boys, in general, were high on these factors.)

A stepwise multiple regression was calculated with scores on the Stanford Achievement Test as the dependent variable and the factor scores

derived from the interactions as predictors. This was possible only for the sixth and eighth grade subjects. The multiple R was significant when four of the factors were included as predictors (Table 12). Three of the four factors participated in the discriminant function differentiating fathers' behavior towards boys and girls.

College Board PSAT scores were available for tenth graders, and when these were reduced to percentiles, a multiple regression was computed for the entire group (Table 12). Two of the factors (Factor IV on Block and Anagram Tasks) yield significant multiple correlation. Both deal with uncritical help by the father.

Table 8

Summary of Stepwise Discriminant

Analyses of Father's Behavior

Step	Task	Factors	Boys $\bar{X}$	Girls $\bar{X}$	Standardized Discriminant Function	F
1	Block	IV Non-critical Help	.46	1.8	-.58	3.80*
2	Anagram	III Critical Help	.49	-1.7	.65	3.58*
3	Blocks	II Reinforcement-Praise	2.2	3.3	-.26	3.18*
4	Raven	IV Critical	7.6	8.7	-.54	2.89*
5	Raven	I Reasoning Latency	73.1	66.3	.64	2.90*
6	Block	III Critical Help	4.5	3.6	.43	2.83*

*$p < .05$

Table 9

Summary of Stepwise Discriminant

Analyses of Child's Behavior

Step	Task	Factor	Boys $\bar{X}$	Girls $\bar{X}$	Standardized Discriminant Function	F
1	Anagram	IV Independence	2.9	3.9	1.00	3.8*
2	Anagram	I Critical	1.4	1.2	.37	3.7*
3	Block	IV Critical	.6	.4	.87	3.0*
4	Block	I Independence	2.4	2.3	-.48	2.8*
5	Anagram	III Proximity & Praise	6.2	6.3	.89	2.8*
6	Raven	III Critical	6.8	7.5	1.00	2.7*
7	Raven	I Reasoning & Praise	105	88	.75	3.4*

*$p < .05$

Table 10

Percentage of Success and Failure
in Classifying Boys and Girls

Discriminant Function of Father Behavior

Actual Group	N	Predicted Group: Boys Percent	Boys N	Girls Percent	Girls N
Boys	24	75%	18	25%	6
Girls	26	35%	9	65%	17

Discriminant Function of Children's Behavior

Actual Group	N	Predicted Group: Boys Percent	Boys N	Girls Percent	Girls N
Boys	24	75%	18	25%	6
Girls	26	27%	7	73%	19

Table 11

Mean factor scores and results of significant Analyses of Variance of Father's behavior toward High and Low Achieving Boys and Girls

Behavior Task	Group	Boys Mean	Girls Mean	F
2-Way Interaction				
Block Factor III (Critical Help)	High Achievers	6.00	3.78	10.67***
	Low Achievers	1.94	4.40	
Main Effect (Achievement)				
Amegram Factor III (Critical Help)	High Achievers	1.08	.19	
	Low Achievers	-7.3	.79	7.74**
2-Way Interaction				
	Achievement X Sex			11.5***

* $p < .05$

** $p < .01$

*** $p < .001$

Table 12

Summary of Stepwise Regression

Analyses of Father's Behavior

Step	Task	Factors	R^2	Beta Coefficient	F
		Grades 6 & 8			
1	Block	IV Non-Critical Help	.12	-.18	4.21*
2	Anagram	III Critical Help	.19	.24	3.44*
3	Anagram	IV Proximity & Help	.24	.26	2.89*
4	Raven	I Reasoning & Latency	.29	-.22	2.70*
		Grades 6, 8 & 10			
1	Anagram	IV Proximity & Help	.09	.30	4.78*
2	Block	IV Non-critical Help	.13	-.21	3.55*

$p < .05$

Discussion

Evaluation of the method. Although there are no clearcut quantitative measures to indicate that the method works, the writers feel that the current study provides evidence that the procedure is valuable. The return rate in actual interviews from the subject pool was low. The difficulties of scheduling busy fathers, mothers and adolescents and finding a time when all three are free should not be underestimated. No published report, as a rule, indicates the headaches of last-minute cancelled appointments. However, we have the tapes as evidence that the subjects lost themselves in the tasks, seemed to act with little regard for the videocamera in most instances, were friendly and eager to help. In no instance did a family refuse to participate after the procedure was explained, refuse to sign the informed consent statement, or refuse to give permission for follow-up. If one purpose of the current study was to demonstrate that visits to the home with videotape equipment to record interactions over set tasks are a practicable means of gathering data, the writers feel that the project was successful.

Observations. The key to the use of this method is the availability of reliable, interpretable analyses of the interactions on the videotapes. The approach taken to coding was to use detailed categories of specific verbal and non-verbal behaviors. There was no a priori classification. Since each record yielded a very large number of observations, some form of data reduction was necessary. The method chosen was factor analyses. The outcome was a series of twelve factors summarizing the behavior of the

father and another twelve for that of the child. A very high proportion of the observations was included in these factors. While the factors are not easy to interpret, they enable us to indicate the degree to which either father or child was involved in the task, offered praise or reproof and provided emotional support. The degree to which the father emphasized generalized concepts, rather than relying on a mechanical use of the answer key, was also described, as was the fathers' willingness to permit the child to explore the tasks on his or her own. Thus, the factor scores provide a useable set of measures with which to analyze differences in behavior among fathers as well as children.

Fathers' reactions to boys contrasted with those to girls. The main purpose of the current study was to determine whether fathers of adolescents provide different signals to boys and girls. To achieve this purpose we carried out discriminant analyses in which the factor scores describing fathers' and childrens behavior in the interactions were used as predictors with the sex of the child as the variable to be classified. In both instances the discriminant functions correctly classified a large proportion of the subjects. That is, fathers behaved differently towards boys and girls; boys and girls differed in their behavior in the interactions.

To analyze the content of the discriminant function analysis is not easy. For the fathers, six of the twelve factors scores discriminated successfully. We hypothesized that fathers would praise boys for success and reprove them for failure at a higher rate than they would praise and reprove girls. There is some evidence in the discriminant functions that fathers did, indeed, care more about a son's success and failure than a

daughters. However, in the current series the distinction between success and failure is not as sharp as we would have liked. The analysis of the verbal interactions does not indicate clearly whether subjective experiences of success and failure were important aspects of the subjects' reactions to the tasks.

What seems to emerge from the analysis is a finding which, while not counter-intuitive, was not described in the original hypotheses. Fathers seem to show a closer working relation with sons than with daughters. This is indicated in Factor I of the Raven, and Factors III on the Blocks and the Anagrams. They are more critical of sons, to a large extent, although a kind of uncritical praise is often given to daughters, especially during the Blocks task. Factor I on the Raven also indicates a greater tendency for fathers of boys than fathers of girls to emphasize general issues and to permit time for the child to tackle the problem rather than reaching for the answer sheet.

Paradoxically, the discriminant function for the childrens' behavior seems to indicate that boys ask for more freedom, and want less help than girls. It almost seems as if the boys want less of the close relationship their fathers are offering, girls would like more of it.

How consistently do fathers and children behave? The discriminant function "correctly classified" fathers of boys very successfully. That is, most of the fathers of boys behaved in a way consistent with the overall pattern described by the discriminant function. The function was somewhat less successful in describing the behavior of fathers of girls; a somewhat higher proportion of girls was "misclassified", i.e. were treated by fathers as if they were boys.

Thus, one can conclude that the technique demonstrated clearly that the behavior of both fathers and children in these tasks was linked to the children's gender. And the differences demonstrated are consonant with the notion that fathers' behavior is a major source of achieving behavior in their children. Our evidence for the latter is, at this stage in the study, quite incomplete. The pattern of behaviors as indicated by the Regression Analysis is not fully interpretable. The regression analysis seems to say that those children whose fathers "take over" tend to have lower levels of achievement than those whose fathers permit them some independence. It is hoped that in the near future additional follow-up will enable us to link the behavior of fathers in the study to the child's achievement level in school, choice of difficult courses, selection of careers, and of institutions of higher learning. When these follow-up studies are complete we should be able to tie the results of the current study to achieving behavior more closely. In terms of Atkinson's model (as presented earlier) one could propose that the incentive value for achieving is higher for boys than for girls if one assumes that the kind of closeness demonstrated by fathers of boys in the current study is indeed rewarding. It is also possible that the focus of the fathers of boys on understanding and on generalized discussion of issues raised by the task (as evidenced by some of the variables in Raven Factor I) would strengthen a boy's feeling of competence and therefore his expectation of success in the kinds of tasks with which we dealt.

We have presented relatively little information from the elaborate interviews carried on with father, mother and child. A factor analysis did show a fairly high level of consistency among the responses to questions on the interview. And, as we expected, parents showed consistently high

expectations for their boys, were inconsistent in their expectations for girls. It is our impression that these parents, like most other people today, are so influenced by the rhetoric of the womens movement that they find it hard to express sexist opinions, whether they have them or not. Nevertheless, they did show the culturally determined tendency to hold high expectations for boys, even if their discussions of their girls' futures were ambiguous.

Next steps. We are currently engaged in collecting data on a group of 100 father-adolescent pairs using somewhat modified versions of the tasks described in the current report. This group consists entirely of students in the tenth grade. Although we did not find consistent and interpretable differences in the data as a function of grade, the decision was taken to make our larger sample more homogeneous than the first group. Tenth grade was selected on the basis of qualitative observations that the trends we have described seemed to be at their strongest at that level. The girls are unequivocably young women and the boys young men; subjects at the lower grade levels were often perceived as children. The tasks were altered only to sharpen the distinction between success and failure. Meanwhile, we expect to continue to obtain follow-up data on the current sample.

Conclusions. It was concluded that the technique used in this study is an effective way of examining a "slice of life" in a search for the determinants of achieving behavior. While the original hypotheses concerning fathers' differential reactions to success and failure were not effectively tested, the data did demonstrate a significant tendency for fathers to develop good working relations with boys and to fail to develop these relations with girls. If follow-up data on involvement in extra-

curricular activities, performance on objective tests such as the College Boards, choice of careers shows an influence of these differences on the child, it may be assumed that we will have developed some insight into the sources of achieving behavior.

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