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THE RELATIONSHIP BETWEEN FAMILIAL CHARACTERISTICS AND TWO MEASURES OF DEPENDENCY

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AND TWO MEASURES OF DEPENDENCY

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THE RELATIONSHIP BETWEEN FAMILIAL CHARACTERISTICS AND TWO MEASURES OF DEPENDENCY

Introduction

Historical Background: Scientific interest in the familial characteristics of ordinal position, family size and parental age at birth developed in the latter part of the 19th Century with the writings of Galton on heredity and eugenics (Gregory, 1958). Early investigators of the relationship between these variables and human behavior included Greenwood and Yule (1914), Pearson (1914) and Heron (1907), however, the statistical methods employed in some of these early studies led to questionable conclusions (Gregory, 1958; Tsuang, 1966).

Early dynamic psychiatry also recognized the importance of this area of investigation. Freud acknowledged the importance of ordinal position to the future development of the individual, but did not elaborate on its specific consequences (Freud, 1953). The Adlerian movement, of course, stressed the importance of the family constellation in shaping human personality. Adler's views were based on clinical impressions, and were subject to a gradual evolution in the course of his career. In his earlier writings, he felt that "restless neurotics" were most frequently second born children (Adler, 1956). Much later, he felt that the oldest and youngest children had more psychological problems than other siblings (Ansbacher and Ansbacher, 1956). Brill (1922) remarked that it would be best for the individual as well as for the race if there were no only children because of the supposed susceptibility of such individuals to physical and psychological abnormalities. The current interest

in population control promises to give new impetus to the study of the behavioral effects of family size and ordinal position. If a whole society begins to limit families to two children, for example, it is important to know how early-born children differ from latter-born. Hopefully, this new impetus will profit from improved methods of investigation and from more recent work which has attempted to integrate the study of these variables with various theoretical frameworks in psychology (Bragg, 1969; Hilton, 1967; Kammeyer, 1967; Koch, 1955; Parsons, 1955; Sampson, 1965; Schachter, 1959; Sears, Whiting, Nowles, and Sears, 1953).

Ordinal position and behavior: First-born children have been described as "more dependent" in a number of studies (Becker, Lerner and Carroll, 1964; Haeberle, 1958; Sampson, Hancock and Francena, 1967; Schachter, 1959; Sears et al., 1953). Most of these studies involved clinical ratings by teachers or psychologists. First-borns have also been described as more dependent on interacting with other people to alleviate their anxiety (Schachter, 1959), more anxious during school testing (Sarason, 1969), less likely to participate in dangerous sports (Nisbett, 1968), and more likely to be in college (Altus, 1966; Schachter, 1963). First-born college males were found to be more field dependent than middle or last-borns (Stewart, 1967). Concerning social dependency or conformity, Bragg (1969) suggests that first-born children more often conform to adult norms, whereas latter-born children more often conform to peer group norms.

Re-analyzing previous studies, Gregory (1958) found an over-representation of youngest children among patients with psychoneurosis and personality disorders. Similar findings are reported by Breslin (1968). The youngest position has also been associated with schizophrenia

(Granville-Grossman, 1966; Gregory, 1958), but so has the first-born position (Solomon and Nuttall, 1967; Sundararaj and Sridhara Rama Rao, 1966). The latter-born positions have also been associated with alcoholism (Bakan, 1949; Breslin, 1968; de Lint, 1964; Navratil, 1959; Tsuang, 1966), yielding behavior and oral dependency (Masling, Weiss and Rothschild, 1968).

Maternal age: The age of the mother at the birth of the child has also been found to be associated with certain psychological differences among children. Ss whose mothers were over 30 at parturition were over-represented among patients exhibiting neuroses, psychoses and disorders associated with alcoholism (Breslin, 1968). Patients who were diagnosed as psychoneurotic or as having personality disorders were found to have older mothers than a control group of hospital patients (Gregory, 1958). A psychiatric population including diagnoses of schizophrenia, affective disorder, pathological personality, reactive depression, immature personality, epilepsy and alcoholism was found to have mothers who were significantly older at parturition than mothers in the general population (Tsuang, 1966). Of these groups, the mothers of the alcoholics and epileptics were among the oldest, with a mean age of over 30 (Tsuang, 1966).

Sibling constellation: The results of a pilot study (McDonagh, 1970) indicate that large families with a preponderance of male siblings are over-represented among heroin addicts. A variety of personality variables have been studied as a function of sibling constellation, but "dependency" was not the focus of these studies (Koch, 1955; Newbert, 1969; Toman, 1969).

Family size: Children with four or more siblings were rated as more dependent (Swift and Spivack, 1968). Smart (1963) found that alcoholics tended to come from larger families. A preponderance of only children was found among patients diagnosed as psychoneurotic or as having personality disorders (Gregory, 1958).

Spacing: Next-to-youngest children who were diagnosed as neurotic, psychotic or as having disorders associated with alcoholism were found to be spaced at a greater interval from their youngest siblings than those of a non-psychiatric population (Breslin, 1968). Such children were the "youngest" for several years until the birth of their younger sibling. Adler's view is that three years is a crucial interval for the birth of successive siblings (Adler, 1956). If the interval is shorter than this, the older child is thought to be less able to cope with feelings of "dethronement."

Summary of studies involving family characteristics: The above studies suggest that certain family characteristics have a direct bearing on the development of the child. There is evidence that these variables are related to ratings of dependency and to membership in certain psychiatric groups, particularly the alcoholic group. All of these variables, however, have not been related to direct measures of dependency in the same population.

Field articulation: The concept of "field articulation" refers to an individual's ability to differentiate his experiences as emanating either from within himself or from the environment (Witkin, Dyk, Faterson, Goodenough and Karp, 1962; Witkin, Lewis, Hertzman, Machover, Meissner and Wapner, 1954). One who is able to differentiate his experiences in this manner is said to possess "field articulation," as psychological

experiences are considered to exist in a complex field. Field articulation exists to varying degrees in the general population. Individuals who rank high in field articulation perform better at perceptual tasks in which they are required to separate an item from an embedding context (or "field"). Superior performance on such tasks is referred to as "field independence," whereas poor performance is known as "field dependence."

Women are more field dependent than men; children more field dependent than adults. Among psychiatric patients, those who are field dependent are described as having "strong uncompensated feelings of inadequacy, passivity and helplessness" (Witkin et al., 1962). Field dependent performance has been positively correlated with other ratings of dependency (Crutchfield, Woodworth and Albrecht, 1958; Linton, 1952; Mednick, cited in Witkin et al., 1962), although some studies have failed to find such a relationship (Goldstein, Neuringer, Reiff and Shelly, 1968; Stewart, 1967). Some groups that have been found to be field dependent include ulcer patients (Gordon, 1953), obese subjects (Pardes and Karp, 1958), asthmatic children (Fishbein, 1958), alcoholics (Fuller, Lunney and Naylor, 1966; Klappensack, 1968; Witkin et al., 1962), non-paranoid schizophrenics (Sugarman and Concro, 1968), and more recently, heroin addicts and other groups of drug abusers (Witkin, 1970).

Field independent behavior has been positively correlated with good personal adjustment (Reppen, 1967), but extreme field independence has also been found among some psychiatric patients with expansive and euphoric delusions (Witkin et al., 1962).

Oral dependency: The oral dependent personality has been described by Blum (1953) as being extremely dependent on others for the

maintenance of his self-esteem. Affection, food and drink may be particularly important to him, but he yearns for them passively. Typically, he relies on others to fulfill psychological and physical needs, rather than actively seeking their fulfillment. When these needs or expectations are frustrated, the oral dependent individual may become "orally aggressive." A typical display or oral aggressiveness may include "biting sarcasm," and other verbal outbursts. Psychoanalytic theory considers obese individuals and ulcer patients as oral dependent. Alcoholics have been described as oral personalities, and heroin addicts as pre-oral (Torda, 1968). Most characterizations of oral-dependent subjects are derived from clinical impressions, but there have also been attempts to measure oral dependency on the Rorschach (Schafer, 1954). Groups which have been found to give more oral dependent responses on the Rorschach include alcoholics (Bertrand and Masling, 1969) and yielders in a conformity situation (Masling et al., 1968). Of particular interest here is the fact that last-born subjects were found to be over-represented among the oral-dependent yielders.

Problem: The above findings indicate that there is a close relationship between certain psychiatric groups and two measures of dependency (field dependency and oral dependency). They also suggest that there is a relationship between certain family characteristics and some psychiatric groups. Of the familial characteristics, only ordinal position has been examined in relation to oral dependency (Masling et al., 1968) and field dependency (Stewart, 1967). The present study has particular relevance to the relationship of field articulation to alcoholism. Witkin (1962) has maintained that field articulation is a stable variable,

such that the field dependency common among alcoholics implies that they were field dependent before the onset of alcoholism. Such individuals would be said to be "predisposed" to such a disorder. If this is true, we should expect that the same family characteristics that are related to alcoholism should be related to field dependency in a non-alcoholic population. Witkin's theory, however, has been challenged by a recent finding that the ingestion of alcohol by non-alcoholic Ss increases field dependency (Kristofferson, 1968). This suggests that poor psychological differentiation is a consequence rather than a predisposing condition in alcoholism. The central problem of this study is to determine whether certain family characteristics contribute to dependency.

Purpose of the study: The purpose of the study is to examine the relationship between a number of independent variables related to family constellation and two measures of dependency, field dependency and oral dependency. A secondary purpose will be to determine if there is a relationship between oral dependency and field dependency.

Hypothesis 1: Ss who score as extremely field dependent with respect to the total subject population will contain an over-representation of the following groups: a) first-born; b) latter-born with four or more siblings; c) those whose mothers were 30 or older at parturition; d) those who are from families where the ratio of male to female siblings is 3:1 or greater.

Hypothesis 2: Ss who perform in the higher ranges of oral dependency scores will include an over-representation of Ss who a) are last born; b) have four siblings or more; c) were born when their mothers were 30 or older; d) are from families where the ratio of male to female siblings is 3:1 or greater.

In addition to these hypotheses, a correlation between field dependent performance on the CF-1 and oral dependent porformance on the Rorschach will be computed to determine if there is a relationship between these two dependency measures.

Subjects: Ss were 122 male high school students in grades 9 through 12, from two small, predominantly white, Midwestern communities. High school students were chosen because it was felt that the results of a previous study of birth order and field articulation (Stewart, 1967) may have been affected by the college status of the Ss.

Of the 156 Ss who originally volunteered to take part, 34 were excluded for a variety of reasons: 2 came from families where one or both parents were remarried and had children prior to the second marriage; one was expelled from school; 2 were only children; the remainder were absent from school at the time of the follow-up testing. In addition to these exclusions, 5 Ss failed to co-operate on the CF-1: 3 of them left the room before the end of the testing period, while 2 others gave responses that strongly suggested that they had answered in a random fashion. Thus, 117 Ss were included in the analysis of field articulation and 122 Ss were included in the study of oral dependence. Table 18 shows the distribution of independent variables among the 117 Ss, and Table 19 shows the distribution of these variables among the 122 Ss.

The mean age of the Ss was 16 years and 2 months, with a range from 14 years 5 months to 18 years 2 months. The mean number of children in these families was 4.43. The I.Q. scores for the portion of the population whose scores were available yielded a full scale mean of 105.1 (California Mental Maturity), with a range from 73 to 140. The mean

non-language I.Q. was 105.6 (with a range from 79 to 144); the mean language I.Q. was 103.1 (with a range from 71 to 128).

Participation in the study was voluntary. Six one-hour periods were required to complete the testing. Assignment to the groups was handled by the school administration so as to cause a minimum of disruption to the school routine. Therefore, certain unknown selective factors may have been involved in selecting the groups. The time of day was comparable for five of the six groups. The order of presentation of the Rorschach and the CF-1 was varied so as to include approximately equal numbers of Ss in each treatment.

Test instruments: Ss were administered a preliminary questionnaire (Appendix B), which asked them to provide information about the ages of their parents, the sex and age (in years and months) of each sibling, and their own age. This information was used to determine the distribution of the independent variables (birth order, family size, maternal age and sibling constellation) in the population. Approximately three weeks after these data had been collected, two tests to measure dependency were administered.

Field dependence was measured by the Flexibility of Closure test (form CF-1), published by Educational Testing Service, Princeton, N.J. This test is also known as the Hidden Figures Test, and is an adaptation of Thurstone's Gottschaldt test. It consists of 32 complex patterns in which one of 5 geometric figures is embedded. Ss are asked to indicate which one of the 5 figures is contained in the pattern by marking their answer in multiple-choice fashion.

Significant correlations have been reported between the EFT and the Thurstone-Gottschaldt test ($+.77$, $P<.01$; $+.69$, $P<.01$), by Phillips

(1957) and Goodman (1960), respectively. Significant correlations between the HFT and the Rod and Frame test have been reported by several experimenters (Crutchfield et al., 1958; Goodman, 1960; Rudin and Stagner, 1958). The latter two studies reported correlations significant beyond the .01 level of probability.

The CF-1 (or HFT) was therefore considered to be a good measure of field articulation, and had the added advantage of being a group test suitable for administration to a large number of Ss. Because ordinal position and the other family characteristics required a large N to give the hypothesis a fair test, the efficiency of the group form was most desirable. Another consideration in selecting the CF-1 was the fact that the high schools, where Ss were tested, did not wish their students' class days to be interrupted for more than one hour. The suggested time of 20 minutes was allowed for the CF-1 in the present experiment.

The measure of oral dependency was a modified form of Harrower's Group Rorschach (Appendix C). Since the degree of oral dependency on Rorschach protocols is determined only by content, Ss were asked to focus on the content of their perceptions. Also, a non-structured approach was used rather than Harrower's multiple choice method (Harrower and Steiner, 1945). The multiple choice method does not include any choices related to oral dependence. Therefore, it seemed that a free-responding situation would be more sensitive to oral dependence.

Spaces were provided on the answer sheet for 2 responses to each blot, and a brief description of the responses. A Rorschach location chart was attached to the answer sheets, and Ss were asked to circle the area of each blot included in their response. If more than 2 responses

occurred to them, they were asked to fill in only the first two. This was an attempt to standardize the number of responses, in order to minimize problems in evaluating atypical total-response outputs. Because Ss were limited to 2 responses per blot, a period of 2 minutes was given to respond to each blot, rather than the 3-minute period suggested by Harrower and Steiner (1945). Blots were presented by a slide projector.

As there has been some question concerning the relationship between field articulation and I.Q. (Goldstein et al., 1968; Reppen, 1967; Witkin et al., 1962), it was considered desirable to obtain I.Q. measures on these Ss. The California Mental Maturity test was on file in both high schools. Only one of the schools, however, was willing to give the experimenter access to the I.Q. scores. Of the 57 Ss in that high school who participated in the study, I.Q. scores were available for 52 Ss.

Scoring procedure: The scoring of the CF-1 included the correction for guessing on multiple-choice tests suggested by Nunnally (1959). One-fourth of wrong answers were subtracted from the total number of correct answers. Ss were informed that wrong answers would be subtracted from their scores, such that it was not to their advantage to make wild guesses.

The scoring of the Rorschach for oral dependency followed closely the system outlined by Schafer (1954). Schafer's criteria for oral dependent responses are reproduced on Table 14. In addition to these, Blum's suggestion to include smoking and drinking responses (1953) was also followed. The Rorschach protocols were judged independently by two psychologists who had no knowledge of the characteristics of the Ss, except that they were male high school students. The judges were instructed to give one point for the presence of each oral dependent

response, and to indicate whether it was "oral receptive" or "oral aggressive." Of approximately 2,200 responses, there were fewer than 5% disagreements between the judges. In nearly all of these cases, the judges agreed to compromise and give half credit for responses. Where they could not agree or compromise, no credit was given.

Results of the field articulation test: Multiple t-tests were run to determine if the six groups could be assumed to have been drawn from the same population, and to determine if time of day and order of presentation were factors influencing performance on the CF-1 test, (Appendix A, Tables 1, 2 and 3, respectively). None of these differences was significant at $P>.05$, two-tailed tests. The mean score on the CF-1 for 117 Ss was 7.002, with a standard deviation of 5.49. The distribution was slightly platykurtic and positively skewed. Field dependent and field independent groups were defined by natural cut-off points approximating the upper and lower fourths of the distribution. The field independent group consisted of 30 Ss (25.6%) having scores of 10.25 or greater; the field dependent group consisted of 29 Ss (24.8%) having scores of 3.75 or less.

The relationship between CF-1 scores and I.Q. was examined. For 52 Ss whose I.Q. scores were available, Pearson product moment correlations were computed for total I.Q., language I.Q. and non-language I.Q. The resulting correlations were $+.05$, $+.35$ and $+.21$, respectively. The first and third of these were not significant ($P>.05$), one-tailed test. The second value (i.e., the correlation between CF-1 and language I.Q.) was significant ($P<.01$), one-tailed test. By excluding the atypical S (#124), the resulting correlations between CF-1 and I.Q. measures were

+.33, +.41 and +.43. All of these were significant beyond the .01 level. In no case did the variance explained by I.Q. scores exceed 18.5%.

A series of Chi Square tests was run to determine which of the family characteristics were over-represented in the field-dependent group. The following characteristics were found to be associated with field dependent performance: an unbalanced sex-ratio of siblings (χ^2= 9.616, df = 2, P<.01, Table 4a), and the 5th and subsequent ordinal positions (χ^2= 23.36, df = 6, P<.001, Table 4b). The relationships between I.Q. and these two familial characteristics were also checked. I.Q. was not related to either unbalanced sibling sex ratio (χ^2= 0.95, P>.30, Table 5) or to the latter ordinal positions (P .20, Kolmogorov-Smirnov one-sample test, Table 5). Hence, the association of these variables with field-dependent performance cannot be attributed to I.Q. differences.*

Ss whose mothers were over 30 at parturition were over-represented in both field dependent and field independent groups (χ^2= 6.39, df = 2, P<.05, Table 4). The same pattern was observed between mother's age and I.Q. measures, but none of the Chi Square values was significant at P = .10 (total I.Q., language I.Q. and non-language I.Q. yielded values of 4.028, 3.502 and 2.766, with probability values of P>.10, P>.10, and P>.20, respectively, df = 2, Table 6). No effect was found due to family size on the CF-1 test (χ^2= 2.12, df = 4, P>.30, Table 4).

The level of father's education was found to be associated with greater field independent performance (χ^2= 6.532, df = 2, P<.05, Table 7).

* It will be noted that on some of the χ^2 tables, the number of cells where expected values are less than 5 exceeds the recommended 20%. Cochran (1954) feels that this does not invalidate the results of χ^2, when df<30, and as long as no cell expectation< 2. All of the χ^2 tests here meet these criteria.

Higher I.Q. scores appeared to be related to higher levels of father's education, but these differences were not significant ($P>.20$, Kolmogorov-Smirnov one-sample test, Table 7).

Oral dependency: Despite an attempt to standardize the total response output on the Rorschach, a considerable number of Ss failed to give 20 responses. A series of Chi Square tests was run to determine if the quantity of responses was related to any of the familial characteristics. It was found that first-borns were over-represented among those who gave 20 responses (Table 10, $\chi^2 = 20.592$, df = 4, $P<.001$). This finding made it necessary to compute the proportion of oral dependent responses to total response output. This proportion was used as the measure of oral dependence for each S. A series of Chi Square tests was run to determine if time of day or order of test presentation affected the proportion of oral responses (Tables 8 and 9). None of these values was significant at $P = .10$.

Oral receptive responses: The oral receptive score was the proportion of oral receptive responses to the total number of responses on a protocol. The distribution of these scores had a mode of zero, a range from zero to .22, and a median of .05. The semi-interquartile range was .05. The scores were grouped according to the semi-interquartile range. Ss from families where the ratio of male to female siblings was 3:1 or greater were slightly over-represented at $+1Q$ and beyond ($\chi^2 = 4.70$, df = 2, $.05<P<.10$, Table 11). Last-born Ss were over-represented at $+2Q$ and beyond, and middle-borns were slightly over-represented below the median. The strength of this relationship is unclear. When Ss are divided into "first born," "middle born" and "last

born," the Chi Square does not reach significance (χ^2= 6.325, df = 4, P>.20). When dichotomized into "last born" and "non-last born," the over-representation of last-borns is significant (χ^2= 3.858, df = 1, P<.05). No significant differences were obtained as a function of family size, maternal age or sibling constellation (Table 11).

Oral aggressive responses: First-borns were found to be over-represented at +1Q and beyond, while last-borns were under-represented below the median (χ^2= 10.21, df = 4, P<.05). No effect was found as a function of ordinal position, family size, maternal age or sibling constellation (Table 12).

The relationships among the measures of dependency: Phi coefficients were computed between CF-1 and each of the subcategories of oral dependency (Table 13). The Phi value of the comparison between CF-1 and the proportion of oral receptive responses was 0.126 (P>.70). The Phi correlation between CF-1 and the proportion of oral aggressive responses was 0.121 (P>.70). The Phi coefficient between oral receptive and oral aggressive responses was 0.017 (P>.80).

Discussion of results: The results of the CF-1 test indicate that ordinal positions of 5 or more are over-represented in a field dependent group. The same ordinal positions are not related to I.Q. or to father's education, hence these factors cannot be invoked to explain the field dependence of latter borns. The absence of a clear relationship to first-born or last-born status differs from Stewart's (1967) results. This difference may be due to the fact that a different measure of field articulation was used, or due to the fact that Stewart studied a college population. It is possible that Stewart's Ss came from smaller

families than the Ss in the present study. The results of the present study parallel somewhat the findings of Smart (1963) and Navratil (1959), that latter born Ss from large families were over-represented among a group of aocoholics.

From Witkin's theory of field articulation one could make numerous speculations as to why the fifth and later born are over-represented among field dependent Ss. One of the central aspects of psychological differentiation is that of a well-defined sense of "self" and "non-self." It may be the case that the latter born in large families receive less individual attention from parents than their early-born siblings. In the early stages in the growth of the family, the parents may have more time to devote to the children, but this decreases progressively as more children are born. Such children may be treated less as individuals and more like members of a crowd. It may also be the case that such children are subtly "unwanted," in contrast to their early born siblings. Another possibility is that biological changes take place in the mother after a certain number of births. Such changes have not been isolated, but they could conceivably affect field articulation.

The field-dependent performance of Ss from families where male siblings outnumber female siblings by 3:1 or more lends itself to a similar interpretation. It is possible that a male child growing up in a predominantly male environment finds less opportunity to define himself as distinct from his siblings. This can be viewed from a transactionalist view of the self, as set forth by George Mead (1913). In Mead's view, the sense of self develops as the individual interacts with the social and physical world. The greater the variety of such experiences

and modes of interaction, the more differentiated will be the sense of "self."

The association between maternal age and extreme performance on the CF-1 is interesting, but difficult to interpret. The fact that the distribution of I.Q. scores and mother's ages was similar to the CF-1 findings suggests the possibility that I.Q. may have contributed to the relationship between CF-1 and maternal age. However, Thurstone studied the relationship between I.Q. and maternal age, and was unable to find any clear relationship within the normal I.Q. range (Thurstone, 1931). The results suggest the need of a further study to examine why and how maternal age could be related to field articulation. Since later-born children tend to have older mothers, it is possible that some of the variability of CF-1 scores attributed to maternal age may actually be accounted for by ordinal position.

The fact that the level of father's education was related to the child's field independence is also very significant. Reppen (1967) found that socio-economic status was positively related to field independence. This finding could also be interpreted from the standpoint of the nature of parent-child interaction. The patterns of parent-child interaction among families in higher socio-economic groups may resemble those which Witkin (1962) has described as promoting field independence, while those patterns most common among lower socio-economic groups may resemble the IID ("interaction inhibiting differentiation") mothers described by Witkin.

Oral dependent responses on the Group Rorschach: Because Ss differed in their total response outputs, it was necessary to define

"oral dependency" by the proportion of oral dependent responses to total responses by each S. It was assumed that this would give a reasonable measure of "oral dependency," as was done in previous studies (Bertrand and Masling, 1969; Masling et al., 1967). There is some reason to believe that this assumption is not satisfactory. Since each S had an equal time to respond, oral dependency could have been defined in terms of the absolute raw score of oral responses. However, because first borns gave a greater total response output, it was possible that a high raw score would be affected by such factors as "conformity" to test instructions. The initial response to a Rorschach blot is considered by many clinicians to be more significant than subsequent responses. However, no weighting system could be found to assign a value to initial responses. Furthermore, in estimating the value of a particular Rorschach response, clinicians may attach particular importance to a single response that is central to some personality trait. In the case of oral dependency, some responses may be considered more central than others.

About all one can say about "oral dependent" responses is that certain groups have been found to give a greater percentage of them, and these groups have been described as showing characteristics of the "orally dependent" personality.

Oral receptive responses: The only family characteristic which seems to be related to oral receptive responses is that of the last-born position, and the strength of this relationship is questionable. The findings are similar to those of Masling (Masling et al., 1968), but the reasons for such findings are unclear. They suggest that last borns are somewhat more concerned about being taken care of.

Oral aggressive responses: The presence of an over-representation of first-borns among the oral aggressive group is not surprising. The first-born is considered to be more verbal, largely because of more initial interaction with adults. If one has greater verbal facility, it is likely that he will use this to his advantage to assert himself in social situations. One component of good verbal ability may well be oral aggressiveness. This relationship has not been established, but suggests the need for further research. A psychoanalytic interpretation of these results would be that first-borns experience greater frustration in meeting their dependency needs, and this frustration leads to oral aggressive behavior. It is possible, however, that frustrated dependency needs may lead to other forms of aggressive behavior, and that oral aggressiveness is merely one of several resolutions to this kind of frustration.

Relationships among dependency measures: The lack of a clear relationship between CF-1 and either of the oral dependent categories, and the lack of a significant relationship between the two measures of oral dependency suggests that each of the three measures has different determinants. The results also suggest that if one wishes to rate individuals on "dependency," the use of these measures together would give a better estimate than the use of one of them alone. This also points to the complexity (or perhaps the confusion) involved in the use of "dependency" in personality literature. It is reminiscent of the problems encountered in the development of a dependency scale from the MMPI (Navran, 1954). The difficulty in arriving at a universally valid measure of dependency may be evidence that there are several different types of dependency which are quite distinct. It suggests that the

usage of the term "dependency" in personality lacks precision and probably leads to a great deal of confusion in clinical assessment.

The relevance of results for psychopathology: The fact that the fifth or later born Ss were over-represented in a normal but field-dependent group, and that the same ordinal positions were over-represented among a group of alcoholics (Navratil, 1959; Smart, 1963) suggests that field dependency may be a sign of a predisposition to alcoholism, and not merely a result of it. This result also suggests that male children who are fifth or later born (as well as those who have a high proportion of male siblings) may lack a well-developed sense of their individuality and social identity. The implications of the oral dependent results are less clear, but these results provide some interesting suggestions for further research.

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APPENDICES

Appendix A

Dissertation Prospectus

Scientific interest in the familial characteristics of ordinal position, family size, and parental age at birth developed in the latter part of the 19th Century with the writings of Galton on heredity and eugenics (Gregory, 1958). Early investigators of the relationship between these variables and human behavior included Greenwood and Yule (1914), Pearson (1914), and Heron (1907). The statistical methods employed in some of the early studies led to questionable conclusions (Gregory, 1958; Tsuang, 1966).

Early dynamic psychiatry recognized the importance of this area of investigation. Although Freud acknowledged the importance of ordinal position for the future development of the individual, he did not elaborate on its specific consequences (Freud, 1953). The Adlerian movement stressed the importance of birth order in shaping human personality. Adler's views were based on clinical impressions, and were subject to a gradual evolution in the course of his career. In his earlier writings, he felt that "restless neurotics" were most frequently second-born children (Adler, 1956). Much later, he felt that the oldest and youngest children had more psychological problems (Ansbacher and Ansbacher, 1956). Brill (1922) remarked that it would be best for the individual as well as the race if there were no only children because of their supposed susceptibility to physical and psychological abnormalities.

The relative lack of integration of birth-order research with other theoretical frameworks in psychology has been pointed out by Kammeyer (1967). He says that there has been "no systematic consideration

of the interpretative theoretical connections between birth order and its correlates." He emphasizes that birth order "in the nuclear family, when it is used as a research variable is only an indicator of some other phenomena."

The current interest in population control promises to give new impetus to the study of the behavioral effects of family size, and ordinal position. If a whole society begins to limit families to two children, for example, it is important to know how personalities are affected by family size and ordinal position. Hopefully, this new impetus will profit from improved methods of investigation and from more recent work which has attempted to integrate the study of these variables with various theoretical viewpoints in psychology. Some of these include role-playing theory (Bragg, 1969), learning theory (Sears, Whiting, Nowles and Sears, 1953), and social interaction patterns (Schachter, 1959).

Ordinal position and behavior: First-born children have been described as "more dependent" in a number of studies (Becker, Lerner and Carroll, 1964; Haeberle, 1958; Sampson and Hancock, 1967; Schachter, 1959; Sears et al., 1953). Most of these involved clinical ratings by teachers or psychologists. First-borns have also been described as "more dependent on interaction with other people to alleviate their anxiety," (Schachter, 1959), more anxious during school testing (Sarason, 1969), and less likely to participate in dangerous sports (Nisbett, 1968). However, Masling, Weiss and Rothschild (1968) found that last borns gave more oral dependent responses on the Rorschach.

Stewart (1967) found that last-born male college students were more field independent on the EFT than a comparable group of first-borns.

A random group of male students scored at an intermediate level. He failed to find any relationship between the EFT and dependency scores on Leary's Interpersonal Check List. It should be pointed out that Stewart's findings may not be generalizable to the general population for several reasons. Birth order has been shown to interact with college status (Altus, 1966; Schachter, 1963). Also, college students more frequently come from middle-class white families. Such families may tend to be smaller than those in the general population, such that "last borns" may often be only second or third born.

Bragg (1969) suggests that first-borns are more dependent on adults (teachers, parents, etc.) while later-borns are more dependent on their peers. He feels that this situation arises quite naturally from the fact that later-born children have more family models to imitate as they are learning social behavior. The degree of identification with parents is made less intense by the presence of other role-models. The system of rewards and punishments within this family is different for later borns than for first borns. The first born is older and bigger than his sibling(s). Hence the latter born must conform more often to the wishes of the older children. The younger children may feel unable to compete with the older ones for the approval of parents, and thus seek social approval more in their peer group.

Hilton (1967) found that mothers of first-borns were rated as significantly more "interfering" and inconsistent in disciplining their children than were mothers of later-borns. These first-borns were also rated as more dependent. This pattern of mothering was found by Witkin (Witkin, Dyk, Faterson, Goodenough and Karp, 1962) to be associated with field dependent behavior.

Re-analyzing previous studies, Gregory (1958) found an over-representation of youngest children among patients with psychoneurotic and personality disorders. Similar findings are reported by Breslin (1968). The youngest position has also been associated with schizophrenia (Granville-Grossman, 1966; Gregory, 1958), but so has the first-born position (Solomon and Nuttall, 1967; Sundararaj and Sridhara Rama Rao, 1966). The last born position has also been associated with alcoholism (Bakan, 1949; Breslin, 1968; de Lint, 1964; Navratil, 1959; Tsuang, 1966), and yielding behavior (Masling et al., 1968).

Maternal Age: The age of the mother at the birth of the child has likewise been found to be associated with certain psychological differences. Children whose mothers were over 30 at parturition were over-represented among patients exhibiting neuroses, psychoses and disorders associated with alcoholism (Breslin, 1968). Patients who were diagnosed as psychoneurotic or as having personality disorders were found to have older mothers than a control group of hospital patients (Gregory, 1958). A psychiatric population including diagnoses of schizophrenia, affective disorder, pathological personality, reactive depression, immature personality, epilepsy and alcoholism were found to have mothers who were significantly older at parturition than mothers in the general population (Tsuang, 1966). Of these groups, the mothers of the alcoholics and the epileptics were among the oldest (Tsuang, 1966).

Sibling Constellation and Family Size: Newbert (1969) found that the middle-born of three boys was less anxious than his brothers; and that the middle born of three girls was more serious, depressed, anxious and worrying than her sisters. She also found that girls with

an older brother and younger sister were more "composed, relaxed and easy-going" than their siblings; that middle-born girls with two brothers were more "placid, phlegmatic and emotionally mature" than their brothers. The results of a pilot study (McDonagh, 1970) indicate that the ratio of male to female siblings among a population of heroin addicts shows a preponderance of male siblings. Thurstone (1931) found that boys seen at a mental health clinic more often had male siblings next oldest or youngest to them, while no such relationship was found for girl patients. Swift and Spivack (1968) found that only children and children with four siblings or more were significantly more "overly reliant" on teachers than were children from intermediate-sized families.

Spacing: Next-to-youngest children who were diagnosed as neurotic, psychotic or as having disorders associated with alcoholism were found to be spaced at a greater interval from their youngest sibling than those of a non-psychiatric population (Breslin, 1968). Such children were "the youngest" for several years until the birth of their younger sibling.

Summary of literature on family characteristics: The above studies suggest that certain family characteristics have a direct bearing on the development of the child's behavior patterns. There is evidence that these variables are related to ratings of dependency and to several psychiatric diagnostic groups, particularly that of alcoholism. All of these variables, however, have not been related to direct measures of dependency in the same population.

Field articulation: The concept of "field articulation" refers to an individual's ability to differentiate his experiences as emanating

either from within himself or from the environment (Witkin et al., 1954; 1962). One who is able to differentiate his experiences in this manner is said to possess "field articulation," as psychological experiences are considered to exist in a complex field. Field articulation exists to varying degrees in the general population. Individuals who rank high in field articulation perform better at perceptual tasks in which they are required to separate an item from an embedding context (or "field"). Superior performance on such tasks is referred to as "field independence," whereas poor performance is known as "field dependence."

Among psychiatric patients, those who are field dependent are described as having "strong uncompensated feelings of inadequacy, passivity, and helplessness (Witkin et al., 1962)." Witkin feels that much of this dependency is rooted in "a lack of developed sense of separate identity," which he describes as poor "psychological differentiation." He maintains that the field dependent (or "global") approach to field articulation tasks "mirrors deep aspects of psychological make-up," (Witkin et al., 1962, p. 206). Some groups that have been found to be field dependent include: ulcer patients (Gordon, 1953), obese people (Pardes and Karp, 1958), and asthmatic children (Fishbein, 1958). Independent clinical assessments of dependency have not always agreed with field dependent performance (Crutchfield, Albrecht and Woodworth, 1962; Stewart, 1967). The example of ulcer patients illustrates the complexity of this relationship. Although these patients saw themselves as being self-reliant and independent, ratings by physicians indicated that they were "over-striving," in an attempt to compensate for deep-seated feelings of dependency and passivity.

Field independence has been positively correlated with scores on intelligence tests (Goldstein, Neuringer, Reiff and Shelly, 1968; Reppen, 1967), however, Witkin's analysis of this situation is that the subtests on the WAIS and WISC which involve analytical ability are responsible for such correlations. Witkin finds no clear-cut relationship between field articulation and scores on verbal subtests, although field dependent children were frequently found to be more verbally expressive (Witkin et al., 1962).

Oral dependency: The oral dependent personality has been described by Blum (1953) as being extremely dependent on others for the maintenance of his self-esteem. Affection, food and drink may be particularly important to him, but he yearns for them passively. Typically, he relies on others to fulfill psychological and physical needs, rather than actively seeking their fulfillment. When these needs or expectations are frustrated, the oral dependent individual may become "orally aggressive." A typical display of oral aggressiveness may include "biting sarcasm," and other verbal outbursts. Psychoanalytic theory considers obese individuals, ulcer patients and alcoholics to be oral dependent. Most characterizations of oral dependent subjects have been derived from clinical impressions, but there have also been attempts to measure oral dependency objectively on the Rorschach (Schafer, 1954). Groups which have been found to give more oral dependent responses on the Rorschach include alcoholics (Bertrand and Masling, 1969) and yielders in a conformity situation (Masling et al., 1968). Of particular interest here is the fact that last-born subjects were found to be over-represented among the oral dependent yielders.

The present experiment: The above findings suggest that there is a relationship between certain family characteristics and behavior. Of the familial characteristics, only ordinal position has been examined in relation to oral dependency (Masling et al., 1968) and field dependency (Stewart, 1967). Ordinal position has also been related to alcoholism (Bakan, 1949; Breslin, 1968; de Lint, 1964; Navratil, 1959; Tsuang, 1966), which Witkin (1962) has, in turn, linked to field dependency. If field articulation is a stable variable, as Witkin has maintained, then one might expect the same familial characteristics that are linked to alcoholism to be associated with field dependency. Stewart (1967) obtained results not consistent with this hypothesis, but there is a question as to his population and family size of his Ss. There is a need, therefore, to examine the relationship of field articulation to several familial characteristics. Oral dependent behavior is of interest because it, too, may vary not only as a function of birth order, but as a function of other familial variables as well. The nature of "dependency" needs to be clarified by relating different ratings of dependency to one another. Field dependency has not clearly been related to oral dependency. The central problem of this study is to determine whether certain family characteristics contribute to dependency. A secondary purpose is to determine the relationship of two dependency measures to one another.

Subjects: Ss will be male high school students from two small, predominantly white, Midwestern communities. This population was chosen because it was felt that the results of a previous study of birth order and field articulation (Stewart, 1967) may have been affected by the college status of the Ss.

Test instruments: Ss will be given a preliminary questionnaire to obtain information concerning birth order, family size, sibling constellation and parental age. This information is necessary to determine how the independent variables are distributed in the population. When this has been determined, two measures of dependency will be administered: the Hidden Figures Test and the Group Rorschach. The Hidden Figures Test is an adaptation of Thurstone's Gottschaldt test, a measure of field articulation. It is published by Educational Testing Service of Princeton, N.J., under the title "Flexibility of Closure, form CF-1." It consists of 32 complex patterns in which one of 5 geometric figures is embedded. Ss are instructed to determine which of the 5 figures is included in the complex patterns, and to indicate their answer in multiple-choice fashion. The test is suitable for group administration, and is rated as being of "high difficulty." The suggested time for administration is 20 minutes.

Significant correlations have been reported between the HFT and the EFT (+.77, $P<.01$; +.69, $P<.01$), by Phillips (1957) and Goodman (1960), respectively. Significant correlations have also been reported between the HFT and the Rod and Frame Test by several experimenters (Crutchfield, Woodworth and Albrecht, 1958; Goodman, 1960; Rudin and Stagner, 1958).

The Group Rorschach will be used to measure oral dependency. Blots will be presented by means of a slide projector, and Ss will be asked to give only two responses to each slide. Answer sheets will include a Rorschach location chart so that Ss may indicate the areas of the blot used in the percept.

Scoring procedures: Scoring of the CF-1 will include the correction for guessing on multiple choice tests suggested by Nunnally

(1959). One-fourth of wrong answers will be subtracted from the number of correct answers. Scoring of the Rorschach for oral dependency will follow the criteria outlined by Schafer (1954). In addition to these, Blum's suggestion to include smoking and drinking responses will be followed. Two psychologists will serve as judges, and will be instructed to give one point for each oral dependent response.

Chi Square tests will be used to determine which of the familial characteristics are over-represented in the field dependent and oral dependent groups. It is expected that the same familial characteristics that have been linked to alcoholism and/or drug addiction will be over-represented in both dependent groups. In addition to this, first-borns should also be over-represented in the field-dependent group, but not in the oral dependent group.

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APPENDIX B

RESEARCH QUESTIONNAIRE #1

John McDonagh, psychologist
U. S. Public Health Service

In the spaces provided below, please fill in the following information: Your name, age, and sex; a list of your brothers and sisters in your family, and the age of each, (you do not need to list their names, just indicate whether they are brothers or sisters); and the age of your parents, (if you're not sure, please estimate their age and indicate that it is an estimate). All of this information will be kept confidential, and is for research purposes only.

_____ Age: _____ _____ _____

Name years months Sex

List of brothers & sisters: Age: (years & months)

Father's age: _____

Mother's age: _____

Thank you for your co-operation. Some of you may be asked to take part in the second stage of the research, which will consist of a brief test on geometric figures, and another brief questionnaire.

APPENDIX C

RESEARCH QUESTIONNAIRE

NAME: _____

This test is one in which you will be asked to use your imagination. A series of slides will be presented to you which are pictures of ink-blots. Each time a slide is presented, you will be asked to write down what you see, with the help of your imagination. There are no right and wrong answers to this test. Just ask yourself what these slides remind you of or what they look like, and let your imagination do the rest. Try to give two answers to each slide. If a slide reminds you of more than two different things, write down only the first two that occur to you. Attached to this answer sheet, you will find black and white pictures of each of these blots. Use a pencil to indicate which parts of each blot you used to make your response.

Brief description of response:

Slide 1: Response 1: _____

Response 2: _____

Slide 2: Response 1: _____

Response 2: _____

Slide 3: Response 1: _____

Response 2: _____

Slide 4: Response 1: _____

Response 2: _____

Brief description of response:

Slide 5: Response 1: _____

Response 2: _____

Slide 6: Response 1: _____

Response 2: _____

Slide 7: Response 1: _____

Response 2: _____

Slide 8: Response 1: _____

Response 2: _____

Slide 9: Response 1: _____

Response 2: _____

Slide 10: Response 1: _____

Response 2: _____

APPENDIX D

TABLE 1

COMPARISONS OF CF-1 MEANS AMONG GROUPS

Group	N	$\bar{X}$	SUM X	SUM X^2	s^2
1	20	6.575	131.50	1229.750	19.2177
2	11	9.05	99.50	1233.500	33.347
3	12	6.56	78.75	689.438	15.703
4	17	5.62	95.50	691.783	9.70
5	32	8.16	261.00	4000.063	60.36
6	25	7.72	193.00	1966.375	19.8506

RESULTS OF t-TESTS OF MEAN DIFFERENCES

DIFFERENCES BETWEEN $\bar{X}$s	F max/min	t value	critical t value (at P = .05)
A) $\bar{X}_2 - \bar{X}_4 = 3.43$	3.42	1.8	2.29 (10,16)
B) $\bar{X}_5 - \bar{X}_4 = 2.54$	6.22	1.62	2.06 (16,31)
C) $\bar{X}_2 - \bar{X}_3 = 2.49$	2.12	1.195	2.22 (10,11)
D) $\bar{X}_5 - \bar{X}_3 = 1.60$	3.80	.90	2.12 (11,31)

TABLE 2

COMPARISONS OF MEAN DIFFERENCES
AS A FUNCTION OF TIME OF DAY (CF-1)

TIME	GROUPS	N	$\bar{X}$	SUM X	SUM X^2	s^2
8:00-10:00	A(1,2,5)	63	7.81	492.00	6463.313	43.2746
10:00-11:30	B(3,6)	37	7.34	271.75	2655.813	18.3311
1:30-2:30	C(4)	17	5.62	95.5	691.783	12.6082

DIFFERENCES BETWEEN $\bar{X}$s	F max/min	t value	critical t value (at P = .05)
1) $\bar{X}_a - \bar{X}_c = 2.19$	3.353	1.84	2.062 (64,16)
2) $\bar{X}_b - \bar{X}_c = 1.72$	1.454	1.547	2.082 (36,16)
3) $\bar{X}_a - \bar{X}_b = 0.47$	2.306	0.435	2.012 (62,36)

TABLE 3

COMPARISON OF MEAN CF-1 DIFFERENCES
BY ORDER OF TEST PRESENTATION

ORDER OF PRESENTATION	GROUPS	N	$\bar{X}$	SUM X	SUM $\bar{X}$	s^2
CF-1/Rorschach	(3,5,6)	69	7.721	532.75	6655.875	37.3898
Rorschach/CF-1	(1,2,4)	48	6.802	326.50	3155.0325	19.8756

DIFFERENCE BETWEEN MEANS	F MAX/MIN	t-value	critical t-value (at P = .05)
$\bar{X}_{cr} - \bar{X}_{rc} = .919$	1.8812	0.9399	2.001

"cr" = CF-1 followed by Rorschach
"rc" = Rorschach followed by CF-1

TABLE 4

CHI SQUARE TESTS FOR CF-1 AND FAMILY CHARACTERISTICS

a) Sex ratio of Siblings and CF-1

		FI	Int.	FD
LF*	O	4	12	14
	E	8.93	12.50	8.57
BF*	O	21	23	10
	E	16.07	22.50	15.43

$\chi^2 = 9.616$, df = 2, $P < .01$.

"LF" refers to unbalanced sex ratio of sibs.
"BF" refers to balanced ratio.
"FI" = field independent
"Int." = intermediate on the CF-1
"FD" = field dependent
* excludes Ss from two-child families.

b) Ordinal Position and CF-1 (a = ordinal position)

		a1	a2	a3, a4	a5
FI	O	10	6	13	1
	E	7.17	9.73	11.0	2.06
Int.	O	12	25	21	0
	E	14.89	19.84	21.33	3.92
FD	O	6	7	9	7
	E	6.94	8.42	10.66	2.00

$\chi^2 = 23.356$, df = 6, significant at P = .001.

Kolmogorov-Smirnov one sample test for small samples applied to subjects who are fifth or later born: ($D = \max. S_{10}(X) - F_0(X)$)

	FI	Int.	FD	
Fo(x)	.256	.744	1.00	(expected cumul. proportion)
Sn(x)	.125	.125	1.00	(observed cumul. proportion)

D=.619, N=8, significant at P = .01.

TABLE 4 (contd.)

CHI SQUARE TESTS FOR CF-1 AND FAMILY CHARACTERISTICS

c) Mother's Age and Field Independence:

		FI	Int.	FD
c1	O	17	46	17
	E	20.48	39.71	19.81
c2	O	13	12	12
	E	9.47	18.37	9.16

χ^2 = 6.388, df = 2, P = .05.

d) Family Size and Field Independence:

		FI	Int.	FD
b2 3	O	13	25	8
	E	11.31	21.87	10.93
b4	O	7	13	7
	E	6.64	12.84	6.42
b5	O	10	20	14
	E	10.82	20.92	10.46

Chi Square = 2.124, df = 4, n.s. at P = .30.

"b2 3" = two and three child families; combined here because of low expectancies in cells.
"b5 " = families with five or more children.

"c1" = Ss whose mothers were 29 or younger at parturition.
"c2" = Ss whose mothers were 30 or more at parturition.

TABLE 5

RELATIONSHIP BETWEEN IQ MEASURES,
SEX RATIO OF SIBLINGS AND ORDINAL POSITION

5a) Non-language I.Q. and Sex Ratio of Siblings:

		≥ 106	105 ≤
LF	O	7	6
	E	6.77	6.23
BF	O	18	17
	E	18.23	16.77

$\chi^2 = 0.022$, df = 1, n.s. at P = .80.

5b) Language I.Q. and Sex Ratio:

		≥ 100	99 ≤
LF	O	7	6
	E	6.77	6.23
BF	O	16	19
	E	16.77	18.23

$\chi^2 = 0.251$, df = 1, n.s. at P = .50.

5c) Total I.Q. and Sex Ratio:

		≥ 98	97 ≤
LF	O	5	8
	E	6.5	6.5
BF	O	19	16
	E	17.5	17.5

$\chi^2 = 0.950$, df = 1, n.s. at P = .30.

LF = families where the ratio of male to female siblings was 3:1 or greater.
BF = families where the ratio of male to female siblings was less than 3:1, and includes only families with 3 or more siblings.

TABLE 5 (contd.)

RELATIONSHIP BETWEEN IQ MEASURES,
SEX RATIO OF SIBLINGS AND ORDINAL POSITION

5d) Total I.Q. and Ordinal Position:

Ordinal Position	I.Q. ≥ 114	{99,113}	98≤	Total
≥5	2	4	2	8
4≤	12	21	12	45

5e) Data from Table 5d converted to expected and observed cumulative proportions of fifth and later-born Ss.

	I.Q. ≥114	{99,113}	98≤	D	
$S_{10}(X)$	.2500	.7500	1.000	.014	p>.20
$F_0(X)$	.2642	.7358	1.000		N=8

5f) Language I.Q. and Ordinal Position:

Ordinal Position	I.Q. ≥ 112	{95,111}	94≤	Total
≥5	3	3	2	8
4≤	9	25	10	44

5g) Data from Table 5f converted to expected and observed cumulative proportions of fifth and later-born Ss.

	I.Q. ≥112	{95,111}	94≤	D	
$S_{10}(X)$	.3750	.7500	1.000	.144	p>.20
$F_0(X)$	.2308	.7692	1.000		N=8

TABLE 5 (contd.)

RELATIONSHIP BETWEEN IQ MEASURES,
SEX RATIO OF SIBLINGS AND ORDINAL POSITION

5h) Non-language I.Q. and Ordinal Position:

Ordinal Position	I.Q. ≥ 116	I.Q. {96,115}	I.Q. 95≤	Total f
≥ 5	2	4	2	8
4≤	11	23	10	44

5i) Data from Table 5h converted to expected and observed cumulative proportions of fith and later born Ss.

	I.Q. ≥ 116	I.Q. {96,115}	I.Q. 95≤	D	
$S_{10}(X)$	.2500	.7500	1.000	.019	p>.20
$F_0(X)$	.2500	.7692	1.000		N=8

$S_{10}(X)$ = observed cumulative proportion

$F_0(X)$ = expected cumulative proportion

$D = \max. S_{10}(X) - F_0(X)$

TABLE 6

RELATIONSHIP BETWEEN I.Q. AND MOTHER'S AGE AT PARTURITION

a) Mother's Age and non-language I.Q.

		≥ 116 IQ	{96 , 115}	96 ≤
c1	O	5	17	5
	E	6.75	14.02	6.23
c2	O	8	10	7
	E	6.25	12.98	5.77

χ^2 = 2.766, df = 2, sign. at P = .30 but n.s. at .20

b) Mother's Age and language I.Q.

		≥ 112 IQ	{94 , 111}	93 ≤
c1	O	6	12	9
	E	6.23	14.54	6.23
c2	O	6	16	3
	E	5.77	13.46	5.77

χ^2 = 3.502, df = 2, n.s. at P = .20

c) Mother's Age and Total I.Q.

		≥ 114 IQ	{99 , 113}	98 ≤
c1	O	5	16	6
	E	7.27	12.46	7.27
c2	O	9	8	8
	E	6.73	11.54	6.73

χ^2 = 4.028, df = 2, sign. at P = .20 but n.s. at .10

c1 = Ss whose mothers were 29 or younger at parturition.
c2 = Ss whose mothers were 30 or more at parturition.

TABLE 7

RELATIONSHIP BETWEEN FATHER'S EDUCATION, CF-1 PERFORMANCE AND I.Q. MEASURES

a) Father's education and CF-1:

no. of years		FI	Int.	FD	(*)
≥ 16	O	12	11	5	
	E	6.94	14.37	6.69	
{9,15}	O	15	39	17	
	E	17.59	36.44	16.96	
8 ≤	O	1	8	5	
	E	3.47	7.19	3.34	

χ^2 = 6.523, .02 P .05, df = 2
(lines show how categories were combined)

* N = 113, because data on father's education was not available in four cases.

b) Years of father's education and Total I.Q.

no. of years	I.Q.			
	≥ 114	{113,99}	98 ≤	
≥ 16	5	6	5	f
{15,9}	8	16	6	f
8 ≤	1	2	2	f

f = observed frequency

TABLE 7 (contd.)

RELATIONSHIP BETWEEN FATHER'S EDUCATION, CF-1 PERFORMANCE AND I.Q. MEASURES

c) Data from Table 7b converted into cumulative observed and expected proportions:

No. of years		Total I.Q. ≥114	{113,99}	98≤	N	D	
≥ 16	$S_{10}(X)$	.3125	.7857	1.000	16	.08	p>.20
	$F_0(X)$	.2745	.7059	1.000			
{9,15}	$S_{10}(X)$	.2667	.8000	1.000	30	.08	p>.20
	$F_0(X)$	.2745	.7059	1.000			
8 ≤	$S_{10}(X)$	.2000	.6000	1.000	5	.11	p>.20
	$F_0(X)$	.2745	.7059	1.000			

$S_{10}(X)$ = observed cumulative proportion
$F_0(X)$ = expected cumulative proportion

D = max $S_{10}(X) - F_0(X)$, notation as per Siegel (1956).

d) Language I.Q. and Father's education:

No. of years	Language I.Q. ≥112	{113,95}	94≤	
≥ 16	6	7	2	f
{9,15}	5	18	7	f
8 ≤	1	2	2	f

TABLE 7 (contd.)

RELATIONSHIP BETWEEN FATHER'S EDUCATION, CF-1 PERFORMANCE AND I.Q. MEASURES

e) Data from Table 7d converted to cumulative observed and expected proportions:

No. of years		Language I.Q. ≥ 112	{113,95}	94≤	N	D	
≥ 16	$S_{10}(X)$	.2400	.7800	1.000	15	.16	p>.20
	$F_0(X)$	.4000	.8667	1.000			
{9,15}	$S_{10}(X)$	.2400	.7800	1.000	30	.07	p>.20
	$F_0(X)$	.1667	.7667	1.000			
8 ≤	$S_{10}(X)$	.2400	.7800	1.000	5	.18	p>.20
	$F_0(X)$	.2000	.6000	1.000			

f) Years of father's education and non-language I.Q.:

No. of years	Non-language I.Q. ≥116	{115,96}	95≤
≥ 16	5	7	3
{15,9}	7	18	5
8 ≤	1	1	3

g) Data from Table 7f converted to cumulative observed and expected proportions:

No. of years		Non-language I.Q. ≥116	{115,96}	95≤	N	D	
≥ 16	$S_{10}(X)$	.2600	.7800	1.000	15	.07	p>.20
	$F_0(X)$	.3333	.8000	1.000			
{15,9}	$S_{10}(X)$	.2600	.7800	1.000	30	.07	p>.20
	$F_0(X)$	.2333	.8333	1.000			
8 ≤	$S_{10}(X)$	.2600	.7800	1.000	5	.38	p>.20
	$F_0(X)$	.2000	.4000	1.000			

TABLE 8

ORAL DEPENDENT RESPONSES AND TIME OF DAY

a) Oral receptive responses and time of day:

Groups		m<	≥ m,+1Q<	≥+1Q,+ 2Q<	≥+2Q
A	O	26	22	10	6
	E	20.98	24.13	11.54	7.34
B	O	9	18	7	3
	E	12.13	13.95	6.67	4.25
C	O	5	6	5	5
	E	6.88	7.92	3.79	2.41

χ^2= 8.757, df = 6, significant at P = .20 but not at .10.

b) Oral aggressive responses and time of day:

Groups		-1Q<	≥ -1Q, m<	≥ m,+1Q<	≥ +1Q,+2Q<	≥ +2Q
A	O	24	7	10	14	9
	E	23.61	7.34	12.07	11.02	9.97
B	O	12	5	11	4	5
	E	13.65	4.25	6.98	6.37	5.76
C	O	9	2	2	3	5
	E	7.74	2.41	3.96	3.61	3.27

Because of the frequency of cells with expectancies less than 5, Chi Square was computed after combining categories, (shown by heavy lines). χ^2= 4.801, df = 4, significant at P = .3, but not at .20.

"m" = median
A included groups 1, 2 & 5 (8:00 to 10:00)
B included groups 3 & 6 (10:00 to 11:30)
C included only group 4 (1:30 to 2:30)

TABLE 9

ORAL DEPENDENT RESPONSES AND ORDER OF PRESENTATION

a) Oral receptive responses and order of presentation:

Groups		m<	≥m,+1Q<	≥+1Q,+2Q<	≥+2Q
RC	O	18	21	8	7
	E	17.70	20.36	9.74	6.20
CR	O	22	25	14	7
	E	22.30	25.64	12.26	7.80

χ^2 = 0.788, df = 3, n.s. at P = .80.

b) Oral aggressive responses and order of presentation:

Groups		-1Q<	≥-1Q,m<	≥m,+1Q<	≥+1Q,+2Q<	≥+2Q
RC	O	19	7	10	9	9
	E	19.92	6.20	10.18	9.29	8.41
CR	O	26	7	13	12	10
	E	25.08	7.80	12.82	11.71	10.59

χ^2 = 0.341, n.s. at P = .95.

"RC" = Rorschach/CF-1
"CR" = CF-1/Rorschach
m = median

TABLE 10

RORSCHACH TOTAL RESPONSE OUTPUT AND BIRTH ORDER

Response Output		FB	MB	LB
20	O	19	12	13
	E	10.46	21.28	12.26
{18-19}	O	9	24	11
	E	10.46	21.28	12.26
17≤	O	1	23	10
	E	8.06	16.44	9.48

χ^2 = 20.592, df = 4, significant at P = .001.

FB = first borns
MB = middle borns
LB = last borns

TABLE 11

ORAL RECEPTIVE RESPONSES AND
FAMILIAL CHARACTERISTICS

a) Ordinal Position:

		a1, a2	a3	a4
m <	O	20	13	8
	E	23.19	10.42	7.39
≥ m, +1Q <	O	25	12	8
	E	25.45	11.43	8.11
≥ +1Q	O	24	6	6
	E	20.36	9.15	6.49

χ^2 = 2.94, df = 4, n.s. at P = .50.

b) Family Size:

		m <	≥ m, +1Q <	≥ +1Q +2Q <	≥ +2Q
b2, b3	O	15	18	8	8
	E	16.47	18.07	8.84	5.62
b4	O	26	27	14	6
	E	24.53	26.93	13.16	8.38

χ^2 = 2.04, df = 3, n.s. at .70.

c) Balanced vs. Unbalanced Families (excluding 2-child families):

		m <	≥ m, +1Q <	≥ +1Q, +2Q <	≥ +2Q
BF	O	27	27	8	7
	E	25.64	24.95	11.78	6.93
LF	O	10	9	9	3
	E	11.36	11.05	5.22	3.07

χ^2 = 4.70, df = 2, significant at P = .10; n.s. at .05.

TABLE 11 (contd.)

ORAL RECEPTIVE RESPONSES AND
FAMILIAL CHARACTERISTICS

d) Maternal Age:

		m<	≥ m,+1Q<	≥ +1Q,+2Q<	≥ +2Q
c1	O	28	32	16	8
	E	27.90	31.30	15.0	9.52
c2	O	13	14	6	6
	E	13.10	14.70	7.00	4.48

χ^2 = 0.271, n.s. at .99.

e) Birth Order:

		+1Q<	≥ +1Q,+2Q<	≥ +2Q
LB	O	23	4	7
	E	23.97	6.13	3.90
NLB	O	63	18	7
	E	62.03	15.87	10.10

χ^2 = 4.50, n.s. at P = 20 (df = 2).

"NLB" = non-last born.

e') Birth Order:

		+2Q<	≥ +2Q
LB	O	81	27
	E	77.90	30.10
NLB	O	7	7
	E	10.10	3.90

χ^2 = 3.858, df = 1, significant at P = .05.

"c1" = mothers 29 and younger
"c2" = mothers 30 and older

TABLE 12

ORAL AGGRESSIVE RESPONSES AND FAMILIAL CHARACTERISTICS

a) Birth Order:

		.10<	≥.10, .145<	≥.145
FB	0	10	11	8
	E	13.77	10.46	4.76
MB	0	25	24	10
	E	28.03	21.30	9.68
LB	0	23	9	2
	E	16.15	12.27	5.58

χ^2 = 10.02, df = 4, significant at P = .05, but not at .02.

b) Sex Ratio of Siblings: (N = 101)

		-1Q<	≥-1Q, m<	≥m, +1Q<	≥+1Q, +2Q<	≥+2Q
LF	0	14	2	5	6	4
	E	11.36	3.07	5.53	5.22	5.83
BF	0	23	8	13	11	15
	E	25.64	6.93	12.47	11.78	13.17

χ^2 = 2.904, df = 4, n.s. at P = .70.

c) Maternal Age:

		-1Q<	≥-1Q, m<	≥m, +1Q<	≥+1Q, +2Q<	≥+2Q
c1	0	29	7	15	17	15
	E	30.16	8.84	15.00	15.00	13.61
c2	0	16	6	7	5	5
	E	14.39	4.16	7.00	7.00	6.39

χ^2 = 2.96, df = 4, n.s. at P = .50.

TABLE 12 (contd.)

ORAL AGGRESSIVE RESPONSES AND FAMILIAL CHARACTERISTICS

d) Family Size:

		-1Q<	≥ -1Q, m<	≥ m, +1Q<	≥ +1Q, +2Q<	≥ +2Q
b2	O	8	3	4	5	1
	E	7.74	2.24	3.79	3.79	3.44
b3	O	9	3	8	3	5
	E	10.33	2.98	5.05	5.05	4.59
b4	O	12	2	2	7	4
	E	9.96	2.88	4.87	4.87	4.43
b5	O	16	5	8	7	10
	E	16.97	4.90	8.29	8.29	7.54

$\chi^2 = 3.346$, df = 6, n.s. at P = .70.

TABLE 13

PHI COEFFICIENTS AMONG DEPENDENCY MEASURES

a) CF-1 and oral receptive:

			CF-1	
			m<	≥ m
OR	m<	O	24	17
		E	20.5	20.5
	≥ m	O	34	41
		E	37.5	37.5

$\chi^2 = 1.848$, df = 1, $\phi = .126$, significant at P = .20 but not significant at P = .10.

b) CF-1 and oral aggressive:

			CF-1	
			m<	≥ m
OA	m<	O	30	23
		E	26.5	26.5
	≥ m	O	28	35
		E	31.5	31.5

$\chi^2 = 1.702$, df = 1, $\phi = .121$, significant at P = .20 but not significant at P = .10.

c) Oral aggressive and oral receptive:

			OA	
			m<	≥ m
OR	m<	O	19	22
		E	20.74	20.26
	≥ m	O	39	42
		E	37.26	43.74

$\chi^2 = 0.035$, df = 1, $\phi = .017$, not significant at P = .80.

"OR" = oral receptive
"OA" = oral aggressive

TABLE 14

CRITERIA FOR ORAL DEPENDENT RESPONSES AS PER SCHAFER (1954)

Dependent orientation; orality; preoccupation with supply and demand.

a) Supply; oral-repective orientation.
   1. Food: meat, vegetables, candy, ice cream, boiled lobster.
   2. Food sources: breasts, udders, nipples, cornfield.
   3. Food objects: syrup jar, frying pan, decanter, cornucopia, table setting.
   4. Food providers: waiters, bakers, cooks, mother bird with worm.
   5. Passive food receivers: chicks with open beaks, nursing lambs, fetus, fat person, big belly, pig, person eating.
   6. Food organs: mouth, lips, tongue, throat, stomach, umbilical cord, navel.
   7. Supplicants: (if thematic context is conspicuously "oral"), beggar, person praying, hands raised in supplication.
   8. Nurturers and Protectors: nurse, cow, mother hen, bird on nest, good fairy, protective angel.
   9. Gift, givers: Santa Claus, Christmas tree, Christmas stocking.
   10. Good luck: wish bone (other than near popular middle orange on Card X), horseshoe.
   11. Oral erotism: figures kissing or nuzzling, lips and lipstick.

b) Demand; oral-aggressive orientation.
   1. Devourers: birds, beasts and persons of prey and their oral and clawing parts, such as lion, tiger, shark, crocodile, vampire, Dracula, wolf, coyote, vulture, octopus, wild boar, tapeworm, crab (other than the popular side blue "crab" and the common side gray and upper gray "crab" on Card X), spider, spider web, claws, teeth, eagles beak, fangs, tusks, jaws, cannibals. Tomato worm, mosquito, and the like may be regarded as defensively minimized "devourers."
   2. Devouring: carcass, animals clawing, biting, chasing or eating other animals or persons.
   3. Engulfing, overwhelming figures and objects: woman with enveloping cloak, witch, octopus, pit, vise, trap, spider.
   4. Depriving figures and objects: breast-plates or brassiere (in heavily "oral" context, these seem to stand for barriers in the way of the desired object - the breast), flat-chested (i.e., breastless) woman, witch.
   5. Deprivation: beggar, scarecrow, emaciated face, wasteland, steer skull in desert (if prevailing emphasis is on "oral" rather than decay themes).
   6. Impaired or denied oral capacity: mouthless face, toothless face, false teeth, dentists' tools.

TABLE 14 (contd.)

CRITERIA FOR ORAL DEPENDENT RESPONSES AS PER SCHAFER (1954)

7. Oral-verbal assault: persons or animals arguing, spitting, yelling, sneering, sticking tongues out.
8. Burdens: (if "oral" themes are emphasized, these images may relate to feelings of being "drained" or "sucked dry"): ox, yoke, camel, mule, man weighted down by pack, Atlas.

TABLE 15

ORAL DEPENDENT AND CF-1 SCORES FOR EACH SUBJECT

Ss.	CF-1	R	Ag	TO	Ss.	CF-1	R	Ag	TO
1.	5.50	.0	.050	.050	20.	10.00	.100	.150	.250
2.	7.75	.0	.175	.175	21.	*	*	*	*
3.	8.50	.125	.0	.125	22.	2.5	.105	.053	.158
4.	12.00	.100	.0	.100	23.	-0.25	.0	.125	.125
5.	12.75	.200	.0	.200	24.	10.25	.150	.150	.300
6.	-0.75	.0	.050	.050	25.	7.75	.059	.118	.177
7.	*	*	*	*	26.	2.00	.222	.0	.222
8.	**	.050	.250	.300	27.	7.75	.0	.0	.0
9.	6.25	.0	.0	.0	28.	8.75	.0	.158	.158
10.	-0.75	.059	.117	.177	29.	3.00	.0	.053	.053
11.	10.75	.0	.111	.111	30.	10.00	.0	.059	.059
12.	5.75	.0	.200	.200	31.	11.50	.053	.158	.211
13.	-1.75	.0	.0	.0	32.	7.00	.050	.200	.250
14.	4.75	.053	.0	.053	33.	6.25	.053	.053	.105
15.	6.50	.050	.100	.150	34.	4.75	.050	.100	.150
16.	4.25	.0	.225	.225	35.	7.75	.050	.150	.200
17.	5.00	.100	.200	.300	36.	13.75	.200	.150	.350
18.	3.75	.0	.158	.158	37.	1.50	.175	.0	.175
19.	2.75	.0	.083	.083	38.	3.75	.200	.050	.250

R = proportion of oral receptive scores
Ag = proportion of oral aggressive scores
TO = proportion of all oral dependent responses
CF-1 = Flexibility of Closure score corrected for guessing.
* only child, eliminated from analyses.
** invalid test, eliminated from analyses involving test where asterisk appears.

TABLE 15 (contd.)

ORAL DEPENDENT AND CF-1 SCORES FOR EACH SUBJECT

Ss.	CF-1	R	Ag	TO	Ss.	CF-1	R	Ag	TO
39.	6.00	.200	.250	.450	62.	2.25	.100	.300	.400
40.	9.00	.050	.200	.250	63.	12.00	.053	.0	.053
41.	6.75	.056	.056	.111	64.	6.00	.0	.0	.0
42.	9.00	.100	.200	.300	65.	4.50	.0	.094	.094
43.	**	.200	.100	.300	66.	22.00	.0	.316	.316
44.	5.00	.050	.050	.100	67.	**	.053	.0	.053
45.	5.00	.0	.067	.067	68.	8.00	.050	.150	.200
46.	7.25	.118	.118	.235	69.	0.25	.053	.105	.158
47.	2.50	.059	.059	.118	70.	6.26	.0	.150	.150
48.	**	.154	.0	.154	71.	14.00	.059	.059	.118
49.	5.75	.053	.0	.053	72.	16.00	.050	.275	.325
50.	4.00	.056	.167	.222	73.	9.25	.150	.050	.200
51.	7.75	.105	.053	.158	74.	0.00	.050	.100	.150
52.	2.75	.050	.150	.200	75.	4.75	.0	.0	.0
53.	2.00	.0	.450	.450	76.	13.75	.111	.056	.167
54.	11.00	.050	.150	.200	77.	2.50	.091	.0	.091
55.	10.75	.050	.0	.050	78.	4.00	.050	.0	.050
56.	**	.063	.063	.125	79.	10.50	.091	.091	.182
57.	5.00	.063	.125	.188	80.	11.00	.0	.039	.039
58.	9.75	.050	.125	.175	81.	6.00	.063	.063	.125
59.	19.00	.105	.105	.210	82.	13.00	.0	.389	.389
60.	11.75	.0	.200	.200	83.	9.75	.100	.150	.250
61.	5.75	.200	.133	.333	84.	3.75	.0	.105	.105

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TABLE 16

Ss FROM FAMILIES WITH A RATIO OF 3:1 OR GREATER, MALE TO FEMALE SIBLINGS

S	a	b	c	d	e	S	a	b	c	d	e
6.	3	3	25	26	-	65.	3	3	35	116	-
10.	1	4	28	-	17	69.	2	5	28	23	46
13.	4	4	36	84	-	78.	1	6	20	-	24
17.	3	5	28	38	45	83.	3	4	31	72	24
23.	2	4	20	15	49	84.	7	12	33	18	18
35.	2	4	26	13	17	89.	3	4	38	23	26
37.	1	6	21	-	23	94.	4	4	31	64	-
38.	3	3	34	144	-	98.	4	4	35	42	-
39.	2	3	29	14	51	99.	2	4	32	25	29
49.	3	3	26	62	-	100.	3	4	34	17	16
51.	2	4	24	14	96	105.	3	5	27	49	31
52.	1	3	28	-	48	109.	2	7	25	12	16
55.	3	3	28	74	-	110.	3	7	26	17	44
56.	3	8	19	12	17	113.	3	3	31	96	-
64.	3	4	25	17	33	115.	6	9	28	22	19

N = 30

TABLE 17

FAMILIAL CHARACTERISTICS OF SUBJECTS

a	birth position
b	number of children in family
c	mother's age at parturition
d	age difference between subject and next oldest sibling (in months)
e	age difference between subject and next youngest sibling (in months)
f	age of subject (years/months)
g	years of formal education (mother)
h	years of formal education (father)
i	father's occupation

TABLE 17 (contd.)

FAMILIAL CHARACTERISTICS OF SUBJECTS

	a	b	c	d	e	f	g	h	i
1.	2	2	25	78	-	14/10	12	12	welder
2.	2	2	32	28	-	15/8	12	8	trader-repairman
3.	1	3	23	-	22	14/8	12	11	correctional officer
4.	1	2	28	-	156	15/0	12	12	automobile plant
5.	4	5	35	68	14	16/5	16	11	correctional officer
6.	3	3	25	26	-	16/11	10	8	assembly line - car mfg.
7.	1	1	29	-	-	15/7	12	11	excavator
8.	1	6	25	-	12	16/3	9	6	factory worker
9.	1	2	19	-	18	17/1	9	10	truck driver
10.	1	4	28	-	17	15/0	11	14	engineer at car mfg.
11.	3	3	22	36	-	17/8	13	12	credit union manager
12.	1	3	17	-	57	15/7	12	12	technician
13.	4	4	36	84	-	16/4	13	14	electrical engineer
14.	5	5	33	24	-	15/9	12	12	auto starter repairman
15.	2	3	29	38	86	17/0	10	11	factory worker
16.	1	4	20	-	42	16/1	12	10	contractor: plastering
17.	3	5	28	38	45	16/3	?	12	airline company
18.	2	4	22	21	92	16/5	16	16	unemployed
19.	1	4	25	-	23	15/9	8	8	farmer
20.	1	2	24	-	18	15/7	14	16	industrial engineer
21.	1	1	36	-	-	16/0	12	12	city employee
22.	3	4	23	60	26	15/9	11	12	farmer
23.	2	4	20	15	49	15/5	12	8	car mfg. plant

TABLE 17 (contd.)

FAMILIAL CHARACTERISTICS OF SUBJECTS

	a	b	c	d	e	f	g	h	i
24.	2	2	21	30	-	16/2	14	18	teacher
25.	2	6	24	20	15	15/6	12	14	personnel officer
26.	2	5	23	22	15	16/4	12	12	?
27.	2	2	27	63	-	14/10	12	12	salesman
28.	3	6	24	14	12	14/10	12	12	car mfg. plant
29.	2	2	22	32	-	15/1	12	?	roofing/painting
30.	3	3	29	24	-	16/11	12	12	foreman - car mfg. plant
31.	1	3	19	-	22	16/8	12	14	experimental - car mfg. plant
32.	4	4	38	158	-	17/5	12	8	retired - car mfg. plant
33.	1	3	23	-	26	17/6	13	12	state hospital
34.	2	3	24	27	50	15/4	13	12	state hospital
35.	2	4	26	13	17	15/6	14	12	warehouse foreman
36.	1	4	19	-	21	16/6	12	12	welder
37.	1	6	21	-	23	15/0	12	12	foreman - car mfg. plant
38.	3	3	34	144	-	15/0	12	8	groundkeeper
39.	2	3	29	14	51	15/8	18	24	pastor
40.	1	4	23	-	32	16/9	12	12	farmer
41.	2	2	28	31	-	17/9	12	10	woodworker
42.	1	2	20	-	19	16/6	12	10	store owner; postal worker
43.	2	2	25	120	-	16/10	12	4	assembly line worker
44.	2	2	25	35	-	15/7	12	16	carpenter foreman
45.	2	2	24	54	-	14/10	10	11	auto driver
46.	2	3	23	28	27	15/7	12	12	pipe fitter

TABLE 17 (contd.)

FAMILIAL CHARACTERISTICS OF SUBJECTS

	a	b	c	d	e	f	g	h	i
47.	4	5	34	28	54	15/11	12	19	dentist
48.	2	2	27	22	-	16/9	15	8	car mfg. plant
49.	3	3	26	62	-	16/11	12	15	draftsman
50.	2	2	25	23	-	14/7	12	8	retail sales clerk
51.	2	4	24	14	11	16/11	8	7	car mfg. plant
52.	1	3	28	-	48	16/0	14	12	general foreman, car plant
53.	1	3	18	-	22	15/9	12	15	tool die maker
54.	4	4	36	34	-	17/6	17	12	horticulturist
55.	3	3	28	74	-	15/2	12	9	unemployed
56.	3	8	19	12	17	17/10	12	12	engineer
57.	3	5	?	24	55	14/10	10	12	purchasing agent
58.	1	3	23	-	42	15/11	12	18	principal
59.	1	2	22	-	200	16/9	10	11	telephone line tester
60.	4	6	32	12	36	16/5	12	11	car mfg. plant
61.	1	3	19	-	58	16/5	11	10	machine operator
62.	1	9	19	-	12	16/9	10	13	factory worker
63.	4	4	42	15	-	15/10	16	19	Ph.D. geology
64.	3	4	25	17	33	17/0	16	20	psychiatrist
65.	3	3	35	116	-	17/0	11	8	retired prison officer
66.	1	3	25	-	14	17/4	16	16	landscape architect
67.	3	3	39	96	-	16/6	12	12	state hospital
68.	2	8	25	12	12	15/4	12	16	assistant superintendent
69.	2	5	28	23	46	16/8	12	13	used car salesman

TABLE 17 (contd.)

FAMILIAL CHARACTERISTICS OF SUBJECTS

	a	b	c	d	e	f	g	h	i
70.	3	5	29	48	60	15/6	11	10	maintenance worker
71.	2	4	33	138	36	15/9	12	12	truck driver
72.	3	7	26	12	46	15/11	14	16	automotive supplier
73.	3	3	37	29	-	15/5	12	12	building supervisor
74.	3	3	40	156	-	14/5	12	12	press operator
75.	2	4	19	12	12	15/6	12	10	welder
76.	1	6	22	-	48	17/8	12	10	contractor
77.	3	5	33	25	23	14/6	12	12	clerk
78.	1	6	20	-	24	18/2	12	12	die maker
79.	2	3	24	36	96	17/6	11	12	worker
80.	2	5	23	11	93	16/9	12	12	group supervisor
81.	3	5	34	132	36	15/11	15	12	company representative
82.	3	3	28	61	-	14/8	18	16	bookkeeper
83.	3	4	31	72	24	15/9	12	10	factory worker
84.	7	12	33	18	18	16/9	12	12	mechanical engineer
85.	2	9	27	13	32	16/1	12	12	design engineer
86.	2	2	35	60	-	16/5	12	18	salesman
87.	2	2	32	72	-	15/8	12	14	factory
88.	6	11	34	28	24	16/2	16	14	accountant
89.	3	4	38	23	26	18/2	12	12	factory
90.	5	7	29	12	48	16/4	?	?	veteran
91.	1	2	21	-	13	16/2	12	12	foreman at auto plant
92.	3	5	26	36	43	16/3	13	12	salesman
93.	4	11	26	19	26	16/9	12	12	optician

TABLE 17 (contd.)

FAMILIAL CHARACTERISTICS OF SUBJECTS

	a	b	c	d	e	f	g	h	i
94.	4	4	31	64	-	16/10	12	6	factory supervisor
95.	3	7	25	36	24	15/1	12	8	set-up man
96.	2	6	25	21	39	15/8	12	16	civil engineer
97.	1	3	29	-	19	15/1	12	12	shipping-receiving
98.	4	4	35	42	-	14/9	13	8	worker
99.	2	4	32	35	29	16/7	16	16	Army officer
100.	3	4	34	17	16	15/1	16	16	Army officer
101.	2	4	26	24	27	15/1	12	12	techn. division, auto.
102.	4	10	29	11	21	15/1	18	16	principal
103.	2	4	26	37	32	16/0	12	8	aircraft mechanic
104.	2	6	31	13	12	17.0	16	17	personnel manager
105.	3	5	27	49	31	15/7	10	12	mechanic
106.	2	4	25	48	66	15/11	12	?	disabled
107.	4	6	32	13	48	15/6	12	12	truck driver
108.	3	7	32	47	23	16/7	12	12	truck driver
109.	2	7	25	12	16	17/1	14	12	plumber
110.	3	7	26	17	44	15/9	14	12	plumber
111.	1	5	22	-	13	16/11	14	16	electrical engineer
112.	2	5	23	13	45	15/10	14	16	electrical engineer
113.	3	3	31	96	-	15/11	12	12	mailman
114.	6	9	33	23	65	16/2	6	12	auto salesman
115.	6	10	28	22	19	17/5	12	12	electrician
116.	7	12	29	13	28	16/0	12	19	lawyer

TABLE 17 (contd.)

FAMILIAL CHARACTERISTICS OF SUBJECTS

	a	b	c	d	e	f	g	h	i
117.	2	4	33	24	12	17/8	16	19	lawyer
118.	4	5	31	27	35	17/1	16	16	paint salesman
119.	1	3	19	-	36	16/0	12	12	quality control, auto.
120.	4	5	41	47	27	16/11	14	19	lawyer (deceased)
121.	5	5	43	27	-	14/8	14	19	lawyer (deceased)
122.	2	2	35	71	-	16/0	12	8	wall washer
123.	3	5	32	16	29	15/6	12	19	physicist
124.	1	2	32	-	48	17/3	12	18	deceased
125.	9	17	30	11	11	16/7	12	12	machine tool & die

TABLE 18

DISTRIBUTION OF INDEPENDENT VARIABLES AMONG 117 SUBJECTS

ORDINAL POSITION (A) AND FAMILY SIZE (B)

	a1	a2	a3	a4	a5	a6+	sum
b2	7	12					19
b3	11	5	11				27
b4	5	11	5	6			27
b5	1	4	8	4	2		19
b6+	4	6	6	4	1	5	27
	28	38	29	14	3	5	117

DISTRIBUTION OF ORDINAL POSITION (A) AND MATERNAL AGE (C)

	a1	a2	a3	a4	a5	a6+	sum
c1	27	30	18	2	1	2	80
c2	1	8	11	12	2	3	37
							117

DISTRIBUTION OF MATERNAL AGE (C) AND SPACING BETWEEN S AND NEXT OLDEST SIB (D)*

	d1	d2	d3	sum
c1	23	23	21	67
c2	3	4	15	22
				89

* excluding first-born

"A" indicates ordinal position (a1=first-born, a2=second born, etc.).
"B" indicates the number of children in the family.
"C" refers to mother's age at parturition (c1=mothers 29 or younger; c2 =mothers who were 30 years or older at parturition).
"D" refers to the time interval between the birth of S and his next older sibling (d1=30 months or less; d2=31 to 53 months inclusive; d3=54 months or more).

TABLE 19

DISTRIBUTION OF ORDINAL POSITION (A) AND FAMILY SIZE AMONG 122 Ss

	a1	a2	a3	a4	a5	a6+	sum
b2	7	14					21
b3	11	5	12				28
b4	5	11	5	6			27
b5	1	4	8	4	2		19
b6+	5	6	6	4	1	5	27
	29	40	31	14	3	5	122

DISTRIBUTION OR ORDINAL POSITION (A) AND MOTHER'S AGE AT PARTURITION (C)

	a1	a2	a3	a4	a5	a6+	sum
c1	28	32	19	2	1	2	84
c2	1	8	12	12	2	3	38
	29	40	31	14	3	5	122

DISTRIBUTION OF MATERNAL AGE (C) AND SPACING BETWEEN S AND NEXT OLDEST SIB (D)

	d1	d2	d3	sum
c1	24	14	8	46
c2	17	4	16	37
	41	18	24	83