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Age and Sex Differences in the Responses of Adolescents to the Hand Test

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Age and Sex Differences in the Responses

of Adolescents to the Hand Test

(TITLE)

BY

Sonya R. Castle

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
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Age and Sex Differences in the Responses
of Adolescents to the Hand Test

Sonya R. Castle

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Abstract

The purpose of the present study was to investigate age and sex differences in the responses of adolescents to the Hand Test (Wagner, 1962). This instrument was administered to 44 14-year olds (26 males and 18 females), 40 15-year-olds (23 males and 17 females), 45 16-year-olds (19 males and 26 females), and 34 17-year-olds (13 males and 21 females) who were enrolled in grades 9, 10, 11, and 12 of a public high school. Data for the 24 Hand Test variables was normalized using a Z-score transformation on the group mean of all subjects to allow for simultaneous analysis of the effects of age, sex, and interactions. Each of the 24 variables was analyzed separately with 4 (Age) X 2 (Sex) analysis of variance. From the results of the analysis of variance, it appeared that there was an age difference for the variable of Exhibition; $F = 3.22$, $p. < .01$. However, post hoc analyses involving a oneway test for trends and a Scheffe's multiple comparison found a significant nonlinear trend for this variable; $F = 4.78$, $p. < .03$. The Scheffe's comparison indicated that none of the four age group means were significantly different from one another. Thus, the raw score mean for the variable of Exhibition increased across the 14-year-old, 15-year-old, and 16-year-old group, and then decreased at the 17-year-old level.

A significant difference with regard to the main effect

of sex of subject was found for the variables of Exhibition and Crippled. Males gave both more Exhibition and Crippled responses. Three Hand Test variables exhibited Age X Sex interactions: Direction, Tension, and Environmental. Fourteen-year-old females gave the most responses scored as Direction, while 14-year-old and 17-year-old males gave the least. With regard to Tension responses, 15-year-old males gave the least responses, and 17-year-old females gave the most. For the Environmental variable, 15-year-old females gave the least responses, and 17-year-old males gave the most.

The small number of sex differences in responses found in this investigation suggests that sex roles may be changing, in that our society is becoming more androgynous, and thus differences in sex roles are becoming less pronounced. The lack of age differences and the small number of interactions found in this study indicates that the personality, as measured by the Hand Test, is relatively stable across the late adolescent years.

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Statement of the Problem

A review of the literature finds that little research has been done investigating age and sex differences in the responses of adolescents to projective techniques. However, what research there is does suggest that these differences do indeed exist. Differences have been found both with responses to the Rorschach and Rosenzweig's Picture Frustration Study. For example, Ames, Metraux, and Walker (1959) found a slow increase in number of responses given by adolescents age ten to sixteen, an increase in human movement responses, and a downward trend of refusals. They also found that girls tend to give a fuller, more precise, and more detailed response while boys tend to be less precise and more global in approach. When Rosenzweig (1969) administered Rosenzweig's Picture Frustration Study to tenth grade students, he found that males are more aggressive, both positively and negatively, than females.

The Hand Test has been used to investigate this issue with children and adults only. However, studies involving both of these populations have indeed found differences. When Stoner (1978) looked at sex differences in the responses of second grade children, significant differences were found on eleven of the 24 variables. After administering the Hand Test to kindergarten and second grade children, Stoner and Spencer (1984) found significant age, sex, and age X sex

interactions. The younger children gave more Exhibition, Tension, Bizarre, and Failure responses. Girls gave more Active, Description, Withdrawal, and Aggression responses, while boys gave more Passive responses. Interactions were found on seven variables. Just as Ames, Metraux, and Walker (1959) concluded that some responses considered to represent disturbance are found with some frequency in normal children and adolescents; likewise, Stoner and Spencer found that many responses given by the children in their study would be considered indicators of pathology in adults, and therefore that these results should not be interpreted in terms of adult norms, but rather as normal responses with children.

Two studies involving adults found significant age effects with no main effects for sex, or interactions (Panek, Wagner, and Avolio, 1978; and Panek and Rush, 1985). A third study however, found significant age differences, three sex differences, and three interactions (Stoner, Panek, and Satterfield, 1982).

Only one study has involved adolescents and the Hand Test. Nace (1983) administered this instrument to boys and girls in grades 6, 7, and 8 and found only one significant sex difference. Boys gave more Exhibition responses. With regard to age, five differences were found between the responses of 12-year-olds and 13-year-olds.

Therefore, it appears that no studies have been done

investigating age and sex differences in the responses of older adolescents to projective measures. The purpose of the present investigation is to use the Hand Test with a population apparently not yet investigated -older adolescents, and thereby add to the existing literature concerning age and sex differences that may be present in the responses of subjects to projective measures.

Research Hypotheses

The following hypotheses were tested:

1. It is expected, that just as Rosenzweig (1969) found, that males will give significantly more responses classified as Aggression.
2. It is expected that females, being more verbally fluent, will give more total responses.
3. It is expected that in agreement with Ames, Metraux, and Walker (1959) that there will be an increase in the number of responses across the four age groups.

A review of the literature suggests that few studies have investigated age and sex differences in the responses of adolescents to projective measures. It appears that the Rorschach, Rosenzweig's Picture Frustration Study, and the Hand Test are the only projective techniques that have been used to investigate this issue, and even studies involving these techniques have not looked at the responses of older adolescents.

The Rorschach and Rosenzweig's Picture Frustration Study have both been used to investigate age and sex differences during adolescence. Ames, Metraux, and Walker (1959) found that the Rorschach response does continue to change in a somewhat patterned and predictable way from the ages of ten to sixteen, and that sex differences in responses do exist during the adolescent years. Their study indicates that characteristic changes are discernible from year to year during the adolescent period, but that the rate of change slows down, while sex differences increase in size. For example, Ames, Metraux, and Walker found that there is a slow increase in number of responses given by adolescents aged ten to sixteen. The percentage of Whole (W) Responses, overall, tends to decrease, while the percentage of Detail Responses (D), or common responses not using the entire blot, increases, and the percentage of Rare Detail (Dd) responses, or responses involving less frequently used areas, (but not

rare responses), stays the same. The percentage of FC responses (a category of color responses which is considered to be an index of adaptive affectivity) increases. They also found that there is an increase in human movement responses, and a downward trend of refusals. Their study confirms that some responses considered traditionally to represent disturbance may actually be found with some frequency in normally functioning children and adolescents.

With regard to sex differences, Ames, Metraux, and Walker (1959) found that "boys tend to be more global in approach, to be less productive of responses, to be slightly less precise in form, and to produce fewer of the enlivened determinants" (p.292). Girls were found to "give a response that tends to be fuller, more detailed, and more precise, richer in the use of enlivened determinants -human movement, color, and shading -and more responsive to human forms" (p. 292).

Rosenzweig (1969) administered the adolescent form of Rosenzweig's Picture Frustration (PF) Study to 224 10th graders. The PF Study is a semiprojective measure consisting of a series of 24 cartoon-like pictures each showing two figures involved in a commonly occurring socially frustrating situation. The subject must study the picture and write in the correct response. Responses are scored as to type of aggression: obstacle-dominance, need-persistence, and ego defense (Rosenzweig, 1969). Rosenzweig found that sex

differences exist during adolescence with males being more aggressive (positively and negatively) than females.

Hand Test studies with adolescents have primarily been concerned with delinquents (Hoover, 1978). Oswald and Loftus (1967) found that delinquent boys produce fewer Affection responses reflecting less positive interpersonal attitudes. Delinquents produced more Aggression responses "supporting the hypothesis that delinquents produce more responses associated with hostile or hurtful attitudes and behavior toward others" (p. 65). The normal group produced more Passive responses indicating that subjects in the normal group tend to be more compliant and socially submissive than subjects in the delinquent group. Delinquents also gave more Description and Failure responses. Generally, research such as the work of Oswald and Loftus has substantiated the value of the acting out score for differentiating delinquents from normals (Hoover, 1978).

Two studies that have involved the use of the Hand Test with children report significant age and sex differences. Stoner (1978) found significant sex differences on 11 of 24 Hand Test variables. This study involved second grade children and found that girls gave significantly more Exhibition and Failure responses, took longer to organize and verbalize a perception (AIRT), and longer to respond to the cards (H - L), which reflected the hesitation in responding

to the cards. Boys gave significantly more Active, Environmental, Description, Withdrawal, and Pathology responses; had a higher Acting Out Score (AOS); and gave a greater number of responses.

Stoner and Spencer (1984) administered the Hand Test to kindergarten and second grade children and found significant age, and sex, and age X sex interactions. Second grade children gave more Affection and Crippled responses, and took longer to respond to the cards (High - Low). The kindergarten children gave more Exhibition, Tension, and Bizarre responses, and also failed more often than older children to give scorable responses (Failure). The authors noted that these responses would be indicators of disturbance or pathology in adults, but not children. Girls gave more Active, Description, Withdrawal, and Aggression responses, while boys gave more Passive responses. Stoner and Spencer found that seven variables exhibited Age X Sex interactions: Exhibition, Action, Description, Withdrawal, total Responses, and Pathological. Younger females gave more Exhibition responses than older females, and this trend was reversed with the older females. Older girls gave the most Active responses, and younger males fewer Active responses. Older females also gave more Environmental responses, while younger boys gave fewer responses. "The older females gave more Description responses, with the trend reversed with the

younger females" (p. 601). The same interaction was found for Withdrawal. The older girls gave more responses (R), while the older boys gave fewer responses. The older females had the highest Pathological score, while the younger group had the lowest. The authors concluded that age differences appeared to be linked to development in cognitive maturation, verbal fluency, and social maturity in that the performance of the kindergarten children was less mature than that of the second grade children. Sex differences, the authors state, appeared to favor the older females, who developmentally are more advanced in verbal skills. The authors state that the fact that younger children gave Failure, Bizarre, and Tension responses, that there were Age X Sex interactions on Pathological and Withdrawal scores, and the fact that older females gave more Withdrawal responses implies that "these results should be interpreted as normal responses with children, and not interpreted quantitatively in terms of known adult norms" (p. 601).

Three studies have investigated age and sex differences with adult responses to the Hand Test. Panek, Wagner, and Avolio (1978) administered the Hand Test to 175 females ranging in age from 17 to 72 years. Subjects were divided into one of seven groups, based on age. Twelve of the 26 Hand Test variables were found to differ significantly among the groups. Significant differences among the age groups

were found for Dependence, Communication, Exhibition, Direction, Acquisition, Maladjustive, Withdrawal, Average Initial Reaction Time, High Minus Low, Pathology, Repetitions, and Emulations.

A study by Stoner, Panek, and Satterfield (1982) investigated age and sex differences on the Hand Test across the life span using 75 males and 75 females ranging in age from 20 to 86 years. The effects of educational level and verbal ability were statistically partialled out. Subjects were placed into one of three groups based on their age. Results showed that there were significant age differences among the groups for eight of the variables. Older adults were found to give more responses classified as Affection, and Dependence, but gave less Active, Aggression, and Acquisition responses. Older adults also gave less Total Responses and had both a lower High - Low score, as well as a lower Acting Out Score. Significant differences among the groups were found with regard to the effect of sex of subject for three variables in that males exhibited more Withdrawal, Pathology, and Description responses across the life span than females. Three Hand Test variables were found to have significant Age X Sex interactions: Passive, Average Initial Reaction Time, and Repetitions.

Panek and Rush (1985) also looked at age and sex differences in responses given to the Hand Test with adult

subjects. Subjects were placed into one of two groups based on their age. The mean age of the first group was 22.47, while the mean age of the second group was 64.87.

Significant effects for age were found with younger adults giving a higher percentage of Affection, Exhibition, Aggression, and Acquisition responses, while older adults gave a higher percentage of Dependence responses. No significant effects were found for the effect of sex or the age by sex interaction.

It appears that the only study investigating age and sex differences in the responses of adolescents to the Hand Test is one by Nace (1983). Subjects in this study were 104 boys and girls in grades 6, 7, and 8. Nace found a significant difference on only one category between the sexes with boys giving significantly more Exhibition responses. When the responses of 12-year-olds were compared with the responses of 13-year-olds, five significant differences were found. The 12-year-olds had a higher median score on Active and Environment, while 13-year-olds had a higher median on Directive, Withdrawal, and Failure.

Thus the available literature does indicate that there are significant age and sex differences in the responses of children, adolescents, and adults to projective measures, whether it be the Rorschach, Rosenzweig's Picture Frustration Study or the Hand Test. It is further apparent that studies

involving older adolescents are lacking. In fact, it appears that no research has been done with this particular age group and the Hand Test. Therefore, the purpose of the present study is to investigate this issue.

Method

Subjects

Subjects were 163 students in Grades 9, 10, 11, and 12 enrolled in the regular classroom at the public high school at Paxton, IL. Subjects were placed into one of four age groups based on their chronological age. The breakdown is as follows: 44 fourteen-year-olds, 26 males and 18 females, 40 fifteen-year-olds, 23 males and 17 females, 45 sixteen-year-olds, 19 males and 26 females, and 34 seventeen-year-olds, 13 males and 21 females.

Apparatus

The Hand Test is a projective technique which utilizes pictures of hands as a projective medium. It is based on the assumption that the subject will project prototypal behavioral tendencies onto the stimulus. The stimuli are presented on ten cards. The first nine cards show a picture of a hand in various positions. The subject is asked what the hand might be doing and his responses are recorded verbatim along with initial response time per card. The last card is blank. When this card is presented, the subject is asked to imagine a hand on the card and tell what the hand

might be doing (Wagner, 1962).

Responses are classified into one of 15 categories; Affection, Dependence, Communication, Exhibition, Direction, Aggression, Acquisition, Active, Passive, Tension, Crippled, Fear, Description, Bizarre, or Failure. Once the responses have been scored, summary scores are then computed. The four summary scales are: Interpersonal (Affection + Dependence + Communication + Exhibition + Direction + Aggression), Environmental (Acquisition + Active + Passive), Maladjustive (Tension + Crippled + Fear), and Withdrawal (Description + Bizarre + Failure). Next the total number of responses is computed (Failures are not included in this total). Then the Average Initial Response Time is computed by totaling the ten initial response times in seconds, and dividing by the number of responses. The High-Low score is computed by subtracting the lowest initial response time from the highest initial response time. The Pathological score is obtained by adding the total number of Maladjustment scores to two times the total number of Withdrawal scores. Lastly, the number of repetitions of the same response is counted (Wagner, 1962).

Procedure

Subjects were tested individually and the purpose of the study was explained to each subject. They were told that they would be taking the Hand Test which involved responding to pictures of hands. Subjects were informed that the

purpose of the study was to see whether there might be any differences in responses given by males or females, or whether there might be differences in responses given by adolescents of various ages. If the student agreed to participate, the experimenter proceeded by giving the Hand Test according to standard administration procedures. Testing took place in a quiet corner of the classroom, or in a separate room, and the age and sex of each subject was recorded on the protocol . Responses given were scored blind by a psychologist experienced at so doing, according to the procedures described by Wagner in the manual (Wagner, 1962).

Results

Data for 24 variables of the Hand Test were normalized using a Z-Score transformation to allow for simultaneous analysis of the effects of age, sex, and interactions. Each of the 24 variables was analyzed separately with a 4(Age of Subject) X 2(Sex of Subject) analysis of variance. Results of these analyses are presented separately in terms of significant age effects, sex of subject effects, and significant interactions.

From the results of the analysis of variance, it appeared that there was an age difference for the variable of Exhibition, $F = 3.22$, $p. < .01$. However, post hoc analyses involving a oneway test for trends and a Scheffe's comparison resulted in a significant nonlinear trend, $F = 4.78$, $p. < .03$.

Results of the Scheffe's comparison indicated that none of the group means were significantly different from one another. Thus for the variable of Exhibition, there was a significant quadratic function whereby the raw score mean for this variable increased across the 14-year-old, 15-year old, and 16-year-old group, and then decreased at the 17-year-old level.

With regard to sex of subject, two of the 24 variables were significant; these were Exhibition $F = 6.43$, $p < .01$, and Crippled $F = 6.04$, $p < .02$. Three Hand Test variables exhibited Age X Sex interactions in the absence of significant main effects: Direction $F = 2.69$, $p < .05$., Tension $F = 3.60$, $p < .02$, and Environmental $F = 3.40$, $p < .02$.

Discussion

With regard to the significant quadratic function or inverted U, found for the variable of Exhibition, it is important to note that the 16-year-old group had the highest raw score mean for this variable, while the raw score mean decreased at the 17-year-old level, thus breaking the linear trend. Responses classified as Exhibition suggest a need to be the center of attention, and a need for praise (Wagner, 1962, p. 21). It is possible that since 16 is the age at which most adolescents receive their driver's license that this is in part responsible for the peak in the raw score mean which is found with this age group. Having a driver's

license gives adolescents a sense of freedom and adds to their prestige in the eyes of their peers (Rice, 1978). This, coupled with the fact, that sixteen is the age at which many teenagers begin to date, and thus may be acting out somewhat more than teens of other ages in an attempt to get the attention of the opposite sex, perhaps best explains this increase up to the age of sixteen. Winch (1971) (cited in Newman & Newman, 1979) states that dating is also a means of achieving status. Thus adolescents look forward to this time, and then perhaps once they have their license and have begun to date, the need to be the center of attention is not as great or important as it once was, and thus the decrease at the 17-year-old level.

Like Nace (1983), this study also found that males gave more Exhibition responses. A need for attention by males has been observed by Beatrice and John Whiting (1975) (cited in Stockard and Johnson, 1980) who studied boys and girls from six cultures between the ages of three and eleven, and found that boys "seek dominance and attention more than girls" (p. 148), and that this behavior does not change significantly over time.

The present investigation also found that males gave more responses classified as Crippled indicating ". . . all types of inferiority, whether it be intellectual, emotional, volitional or physical" (Wagner, 1962, p. 23). This once

again, may be related to the later adolescent years being the time of dating. Since in our society, it is usually the male that asks the female for a date, it may be that males experience more rejection than females when asking for a date, and that this leads to feelings of inferiority. It may also be that since females tend to reach physical maturity before males, that males are still very concerned with their physical development, and thus experience anxiety and some feelings of inferiority concerning their growth and appearance.

Three significant Age X Sex interactions were obtained in the absence of significant main effects on the variables of Direction, Tension, and Environmental (Acquisition + Active + Passive). With regard to Direction, results indicated the highest scores were given by 14-year-old females, and this trend was reversed for 14-year- and 17 year-old males. Wagner (1962) states that the purpose of directing others is control. Since this testing was done in the fall, it may be that the 14-year-old females were still adjusting to a new school. Once in high school, they were now the youngest and had less control than when they were in junior high, where they would have been the oldest and thus in a somewhat superior position. Thus, the high number of responses scored as Direction may indicate an attempt to hang on to that sense of control and superiority. It should be

noted that the 14-year-old males had a low raw score mean value for this variable, which may indicate that issues of control and dominance are not as important to males, and therefore the 14-year-old males relinquished this more easily; while the 17-year-old males simply appear unconcerned about these issues. It is also true that by the age of 17, the importance of peer group conformity has declined while independence in judgments has increased. The older adolescent is more confident about his or her competences, and therefore less defensive and less in need of reassurance (Newman & Newman, 1979). Thus older adolescents are not as concerned as younger adolescents, especially younger females, with issues of control.

For Tension responses, 15-year-old males gave the least responses, and 17-year-old females gave the most responses indicating ". . . an expenditure of energy which is keenly felt, yet accomplishes little, -an internal straining in the face of external difficulties" (Wagner, 1962, p. 23). This interaction might best be explained by the fact that during the adolescent years, females tend to be more mature than males, and thus it may be that the 17-year-old females are thinking more about their future than males, and are experiencing some anxiety concerning it. They are likely to be more concerned about where they will go to college, where they will find a job, and when they will marry.

With regard to the Environmental score (Acquisition + Active + Passive), 15-year-old females gave the least responses, and 17-year-old males gave the most. Environmental responses are ". . . assumed to represent generalized attitudes toward the impersonal world, i.e., a readiness to respond to or come to grips with the environment in a characteristic fashion" (Wagner, 1962, p. 21). Environmental responses suggest "the extent to which the individual is concerned with environmental pursuits and the energy he is willing to invest in their attainment" (Wagner, 1962, p. 21). It thus appears that 17-year old males are more willing than 15-year-old females to work for what they want. This might perhaps be due to the fact that many 17-year-old males have part-time jobs, and have gained an idea of the cost and work that it takes to attain various items, such as a car, more so than 15-year-old females who may not be old enough to have a part-time job. Parents expect older adolescents to show responsibility in many areas, including performance of family chores, earning and spending money, care of personal belongings and room, use of the family car, use of the telephone, doing work for others outside the house, and use of family property such as furniture and tools (Rice, 1978). Society in general also has certain expectations for the older adolescent. One may be expected to hold a job, marry, serve the country, attend church, and

vote (Newman & Newman, 1979).

Thus the findings of this study did not support any of the research hypotheses; that is, males did not give more responses classified as aggression, females did not give more total responses, and the number of responses given did not increase across the four age groups. This relative lack of sex differences in responses may best be explained by the fact that sex roles are apparently becoming more similar, as people are becoming more androgynous. Also, it is important to note that studies finding the aforementioned differences took place in the 60's and early 70's and thus are somewhat dated. The Supreme Court decision on abortion, the promotion of the Equal Rights Amendment, Affirmative Action guidelines, and Title IX of the Higher Education of 1972 were all attempts to create changes at the institutional level which would prohibit discrimination on the basis of sex and move us toward a more androgynous society (Kaplan & Bean, 1976).

Most young women still expect to marry and have children, with the great majority expecting to combine marriage with work outside the home, yet young women today also expect to attain monetary as well as personal gains from employment (Rogers, 1978). They also expect their family role to be somewhat different from that of their mothers. "They look forward to a more equalitarain relationship, and if they are employed they expect their husbands to help with

household chores and children (Rogers, 1978, p. 110). Loft (1973) (cited in Rogers, 1978) states that this change has gained a large boost from the feminist movement. Chess, Thomas, and Cameron (1976) (cited in Rogers, 1978, p. 110) claim that "adolescent girls now take for granted that they will work and have quite definite career goals." More American women are attempting to combine the "modern role" with the "traditional feminine role" by combining careers and receiving an education with getting married and raising families; and in order to perform both roles successfully, these women are becoming more assertive, goal-directed, and highly flexible (Jersild, Brook, and Brook, 1978).

Thus the small number of sex differences found in this study, as well as the lack of traditionally expected differences, seems to indicate that we are moving toward a more androgynous society. It also appears that recent social changes, such as the feminist movement, as well as the higher number of women pursuing a career, are leading to somewhat of a breakdown concerning traditional sex roles, and thus the small number of sex differences detected in the responses of adolescents to the Hand Test.

This study, finding only a curvilinear trend regarding age for the variable of Exhibition, and only three interactions in the responses of older adolescents to the Hand Test, seems to support the stability of the personality

(as measured by this instrument) across this particular age group. Thus, while the Hand Test is sensitive to age and sex differences, individuals using this instrument with adolescents do not need to be overly concerned, as few differences in responses actually exist. The stability of the personality found in this investigation with high school age subjects, as well as past studies involving both children and adults, seems to indicate that the personality, as measured by the Hand Test, is relatively stable across the lifespan.

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Table 1

Raw Score Means and Standard Deviations for Hand Test Categories for Male and Female 14-, 15-, 16-, and 17-year-olds

Categories	14-year-olds				15-year-olds				16-year-olds				17-year-olds			
	M(N = 26)		F(N = 18)		M(N = 23)		F(N = 17)		M(N = 19)		F(N = 26)		M(N = 13)		F(N = 21)	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
AFF	1.08	.98	1.33	.98	1.26	.86	1.35	.86	1.26	.87	.96	.66	.92	.49	1.24	1.00
DEP	0	0	.06	.24	.13	.46	.06	.24	0	0	.19	.40	0	0	.10	.30
COM	1.04	.96	1.55	1.25	1.00	1.17	1.41	1.12	1.37	1.01	1.31	1.32	2.00	.82	1.38	.80
EXH	.15	.37	.06	.24	.26	.45	.12	.33	.47	.61	.27	.45	.31	.63	.05	.22
DIR	.54	.81	1.28	1.36	.57	.84	.41	.51	.79	.79	.58	.90	.54	.78	1.05	1.16
AGG	2.03	1.22	1.67	.84	1.96	1.11	1.88	.86	1.74	.93	1.46	.76	1.38	.87	1.62	1.12
ACQ	1.46	1.56	1.11	1.28	1.22	.95	1.06	1.03	1.11	.99	1.35	1.13	1.23	.93	1.33	.86
ACT	3.15	1.29	2.89	1.32	3.00	1.41	2.71	.99	2.84	1.30	3.19	1.06	3.85	1.28	2.76	1.14
PAS	.54	.86	.39	.61	.48	.59	.35	.49	.26	.45	.58	.58	.46	.78	.43	.68
TEN	.58	.95	.22	.55	.13	.34	.53	.62	.16	.50	.31	.55	.15	.38	.62	.67
CRIP	.12	.33	0	0	.09	.29	.06	.24	.21	.42	.04	.20	.08	.28	0	0
FEAR	.27	.72	.11	.32	.48	.67	.12	.33	.37	.68	.38	.64	.31	.48	.29	.72
DES	.12	.33	.06	.24	.09	.42	.12	.33	.32	.95	.04	.20	.08	.28	.05	.22
FAIL	.35	.75	.28	.57	.13	.34	.47	.80	.32	.67	.42	.99	.46	.88	.24	.44
BIZ	0	0	0	0	.04	.21	0	0	0	0	0	0	0	0	0	0
INT	4.85	2.09	5.94	1.51	5.17	1.75	5.24	1.03	5.58	2.36	4.73	1.69	5.15	1.21	5.43	1.25
ENV	5.15	1.93	4.44	1.46	4.70	1.46	4.12	.78	4.21	1.32	5.12	1.56	5.54	1.71	4.52	1.21
MAL	.96	1.25	.33	.59	.70	.76	.71	.69	.74	.81	.73	.92	.54	.66	.90	1.22
WITH	.46	.81	.33	.77	.26	.54	.53	.94	.63	1.07	.46	.99	.54	.88	.29	.46
R	11.08	2.13	10.78	1.11	10.78	.90	9.59	2.62	10.74	1.41	10.65	1.44	11.31	1.44	11.05	1.02
AIRT	4.55	2.99	4.29	1.28	4.09	1.19	3.96	1.11	3.43	.97	4.38	2.44	3.65	1.25	3.87	1.49
H-L	10.85	8.08	10.83	6.88	9.43	4.05	7.76	4.75	8.16	4.17	12.77	12.75	9.00	5.26	9.33	6.69
PATH	1.88	1.86	.94	1.89	1.22	1.24	1.88	2.00	1.79	1.58	1.65	2.08	1.62	2.14	1.48	1.21
REP	.73	.87	.44	.78	.65	.88	.47	.51	.53	.84	.35	.56	.31	.63	.52	.75

Table 2

Raw Score Means and Standard Deviations for Hand Test Categories for Groups By Age

	14-year-olds		15-year-olds		16-year-olds		17-year-olds	
	(N = 44)		(N = 40)		(N = 45)		(N = 34)	
	M	SD	M	SD	M	SD	M	SD
AFF	1.18	.97	1.30	.85	1.09	.76	1.11	.84
DEP	.02	.15	.10	.38	.11	.32	.06	.24
COM	1.25	1.10	1.18	1.15	1.33	1.19	1.62	.85
EXH	.11	.32	.20	.41	.36	.53	.15	.44
DIR	.84	1.12	.50	.72	.67	.85	.85	1.05
AGG	1.89	1.08	1.93	1.00	1.58	.84	1.53	1.02
ACQ	1.32	1.44	1.15	.98	1.24	1.07	1.29	.87
ACT	3.05	1.29	2.88	1.24	3.04	1.17	3.18	1.29
PAS	.48	.76	.43	.55	.44	.55	.44	.70
TEN	.43	.82	.30	.52	.24	.53	.44	.61
CRIP	.07	.26	.08	.27	.11	.32	.03	.17
FEAR	.20	.59	.33	.57	.38	.65	.29	.63
DES	.09	.29	.10	.38	.16	.64	.06	.24
FAIL	.32	.67	.28	.60	.38	.86	.32	.64
BIZ	0	0	.03	.16	0	0	0	0
INT	5.30	1.94	5.20	1.47	5.09	2.02	5.32	1.22
ENV	4.86	1.77	4.45	1.24	4.73	1.51	4.91	1.48
MAL	.70	1.07	.70	.72	.73	.86	.76	1.05
WITH	.41	.79	.38	.74	.53	1.01	.38	.65
R	10.95	1.78	10.28	1.91	10.69	1.41	11.15	1.18
AIRT	4.44	2.42	4.03	1.14	3.98	2.00	3.79	1.39
H-L	10.84	7.53	8.73	4.39	10.82	10.24	9.21	6.10
PATH	1.50	1.91	1.50	1.62	1.71	1.87	1.53	1.60
REP	.61	.84	.58	.75	.42	.69	.44	.70