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A Comparison of "High Causally" and "Low Causally" Oriented Sixth Grade Children on Personality Variables Indicative of Mental Health¹

By ROLF E. MUUSS

Abstract. Two tests served as selection criteria for "high" and "low" causally oriented groups, the Social Causal Test and the Physical Causal Test. They were administered to 280 sixth graders. The "Highs" (N 90) were defined as those above the group mean on both tests, "Lows" (N 73) as those falling below both means. The 12 item Intolerance of Ambiguity Scale and the 24 item Children's Antidemocratic Attitude Scale were administered to all subjects. The "Highs" showed significantly less antidemocratic attitude and less intolerance of ambiguity than the "Lows". The differences remained significant if subjects were matched on IQ scores.

The purpose of this study was to investigate whether and to what extent sixth grade children who are high causally oriented toward their environment differ from children who are low causally oriented on measures that are generally considered as indices of mental health. The term causal orientation, as used in this paper, needs some clarification.

A causal orientation toward one's environment involves an understanding of the lawfulness of cause-effect relationships as well as an awareness of the probabilistic nature of knowledge. In the social environment, a causal approach implies a recognition of the dynamic complexity of human motivation and an awareness of antecedents and consequences of behavior.

HYPOTHESIS

The hypothesis of this study is that children who are high causally oriented toward their environment will differ from low causally oriented subjects on the criterion variables. In agreement with the basic hypothesis under investigation in the Preventive Psychiatry Research Project at the State University of Iowa it is assumed that the difference will be in the direction which is, generally speaking, considered as indicative of mental health. The subhypotheses that follow for this particular study are that subjects who are high causally oriented in terms of the selection criteria will differ from low causally oriented subjects in the following ways:

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1. They will be more reluctant to agree with statements that are indicative of intolerance of ambiguity. Intolerance of ambiguity is considered as a general trait, characterized by a need to structure an unstructured situation, to avoid ambiguous stimuli, by a tendency to resort to black-white solutions and to maintain a "status quo" rather than to take a chance (2). Obviously the concept, intolerance of ambiguity, is closely related to rigidity.
2. They will have a more democratic attitude and will show more tolerance toward ethnocentrism.
3. In agreement with other research findings (6) it is hypothesized that ethnocentrism is positively related to intolerance of ambiguity.

PROCEDURE

In order to test the above hypotheses, a series of group tests were administered to 280 sixth grade pupils in the public schools of a midwestern community of 80,000. The tests were administered during the last two months of the 1957-58 school year. About half of the subjects came from experimental classes with special emphasis on the dynamics of human behavior, while the other half came from regular classes, and served as control for the experimental classes in another research study. No further implication will be discussed concerning the fact that the total group was made up from experimental and control classes except that in the analysis in Tables 1 to 3, the data will be analyzed for both groups separately, in order to show that it is predominantly the degree of causal orientation that accounts for the differences and not only participation or non-participation in an experimental class. Thus the data in rows 2 and 3 in each of the Tables 1 to 3 are presented in order to indicate that the experimental classes are not taught a special way to answer tests of this nature. From the total of 280 students, a group of high causally oriented subjects, henceforth referred to as the "Highs" and a group of low causally oriented subjects, henceforth referred to as the "Lows" were selected. Two tests were administered for the selection of the "Highs" and the "Lows", the Social Causal Test (Part I has a reliability of $r = .63$ and Part II has a reliability of $r = .77$) and the Physical Causal Test (reliability of $r = .80$).

The correlation between IQ and the Social Causal Test is $r = .08$ (N 260) and the correlation between IQ and the Physical Causal Test is $r = .58$ (N 251). It is this latter fact that explains that the "Highs" significantly differ from the "Lows" in IQ scores. It will be shown that this fact does not invalidate the data of this study since the criterion variables are relatively unrelated to IQ and since differences between the "Highs" and the "Lows" remain significant if IQ is controlled.

For the purpose of the study, the "Highs" were defined as all those subjects who fell above the group mean on both selection criteria. The "Lows" are those subjects who fell below the group mean on both selection criteria. Out of 280 subjects, 168 met the selection criteria. In order to measure whether differences existed between the "Highs" and the "Lows" the following test was administered to all subjects. It consisted of three combined scales, the items of which were randomly interspersed, yielding three different scores:

1. A 12 item *Intolerance of Ambiguity Scale* was combined from several tests known to be reliable. Since this form of the ambiguity scale has not been published previously, the individual items will be presented: (The answer in parentheses is scored as indicative of intolerance of ambiguity.)

1. I often wish people would be more definite about things (1). (agree)
2. I don't like to undertake any project unless I have a pretty good idea as to how it will turn out (1). (agree)
3. It is annoying to listen to a teacher who cannot seem to make up her mind about what she really believes (1). (agree)
4. People who seem unsure and uncertain about things make me feel uncomfortable (1). (agree)
5. A person should always stick to a decision he makes (3). (agree)
6. There are just two kinds of boys, the regular boys and the no-goods (3). (agree)
7. It is best to do most things at the same time and in the same way each day (3). (agree)
8. The best leader gives specific instructions so that those under him have nothing to worry about (3). (agree)
9. Nobody can feel love and hate towards the same person (6). (agree)
10. It is always better to have a definite course of action than to be changing back and forth among several possibilities (6). (agree)
11. It is better to keep on with the present method of doing things than to take chances with a new method (6). (agree)
12. It is better to take a chance than to let your life get into a rut (6). (disagree)

2. The 24 item *Children's Antidemocratic Attitude Scale* was adopted from Gough, Harris, Martin and Edwards (4). Agreement with each of the 24 items was interpreted as indicative of antidemocratic attitude or as "related to prejudicial attitudes toward minority groups" (4). Again the socially more acceptable answer is the "disagree" answer.

3. Since all, except one, of the answers from the two above scales are scored "agree" as the "undesirable" response and "disagree" as the socially more acceptable response, a need was felt to break the set in case an individual would mark all answers "disagree". Therefore a ten item *Break Set Scale* was designed with each of the items having a high probability of being answered "agree".

RESULTS

The findings of this analysis are reported in Tables 1 to 3. In each instance the number of subjects, the mean number of responses and the standard deviation for both the "Highs" and the "Lows" are reported. The difference between both groups is compared by way of t test and the obtained t is designated with the conventional levels of significance. In each instance the t test is computed four times. First it is done for the total number of subjects from the high and the low groups, second for the high and low subjects who came from the experimental groups and third for the high and low subjects who came from the control groups. Finally, an analysis is made of differences between 32 high subjects and 32 low subjects who are matched on IQ. Thus the data reported in the last row might be considered as a method to control for IQ.

Homogeneity of variances was tested for each of the variables and the ratio between the group variances is reported in the first row of each table. In Table 2 where the ratio is larger than two, the level of significance of the t is so great that statistical adjustment appears to be unnecessary.

Looking at each of the three tables separately we find:

Table 1 shows the data from the *Intolerance of Ambiguity Scale*. The obtained t of 5.05 is significant at far beyond the .01 level. Thus we can reject the null hypothesis that high causally and low causally oriented children are not different in respect to the number

Table 1

Comparison of the Mean Number of "Ambiguous Responses" of the High and Low Groups on the "Verbal Intolerance of Ambiguity Scale".†

	High Group			Low Group			t
	N	M	SD	N	M	SD	
All Subjects	90	5.19	1.79	73	6.68	1.92††	5.05***
Experimental Subjects only	60	5.07	1.94	23	6.17	2.20	2.065*
Control Subjects only	30	5.43	1.41	50	6.92	1.72	4.148***
Subjects matched on IQ	32	5.00	1.64	32	6.50	1.87	3.358***

†An increase in score indicates an increase in "Intolerance of ambiguity".

††Ratio between group variances for all subjects = 1.14703

*Significant at or below the .05 level

**Significant at or below the .01 level

***Significant at or below the .005 level

of ambiguous responses made on a verbal intolerance of ambiguity scale. These data retain their significance if analyzed separately for

those children who came from experimental classes and those who came from control classes. They also remain significant if analyzed for 32 High and 32 Low subjects matched on IQ. The idea that difference in intelligence does not account for the difference in responses to the intolerance of ambiguity scale is further supported by the correlation of the Ambiguity Scale to IQ, which for our total sample of N 232 subjects is $r = -.07$, not significant.

Table 2 reports the data for "Highs" and "Lows" on the *Children's Antidemocratic Attitude Scale*. The difference between both groups results in a t ratio of 6.68 which is significant at far beyond the .01 level. We can reject with an extremely high level of confidence the null hypothesis that high causally and low causally oriented children are not different in respect to antidemocratic responses made on the CADS. The difference remains significant if

Table 2

Comparison of the Mean Number of "Agree Responses" of the High Group and the Low Group on the Children's Antidemocratic Attitude Scale (CADS).†

	High Group			Low Group			t
	N	M	SD	N	M	SD	
All Subjects	90	4.39	2.29	73	7.55	3.45††	6.676***
Experimental Subjects only	60	4.57	2.51	23	6.65	3.45	2.59**
Control Subjects only	30	4.03	1.72	50	7.96	3.37	6.794***
Subjects matched on IQ	32	3.97	1.85	32	6.75	3.16	4.229***

†An increase in score indicates an increase in "antidemocratic attitude".

††Ratio between group variances for all subjects = 2.27036

*Significant at or below the .05 level

**Significant at or below the .01 level

***Significant at or below the .005 level

analyzed separately for both the experimental and the control groups. However, the difference is not as great for the experimental classes as it is for the control classes. This is obviously due to lower mean scores of the "Lows" in the experimental groups. The same data analyzed for subjects who are matched on IQ remain significant at far beyond the .01 level. The correlation of the CADS and IQ in our sample of N 232 was $r = -.24$, significant at the .01 level. Even though there is a significant negative relationship between IQ and CADS, the actual size of the correlation is so small that it only accounts for a small part of the difference between the "Highs" and the "Lows", a fact which is supported by the t test made for the 32 high and 32 low subjects matched on IQ.

Table 3 reports the data from the 10 item *Break Set Scale*. The mean "disagree" score for both groups is low; $M = 1.73$ for the "Highs" and 1.78 for the "Lows" which indicates that the break-set items operated in the assumed direction. The differences between the "Highs" and the "Lows" are not significant, so we may accept the null hypothesis that the two groups do not differ in respect to the

Table 3

Comparison of the Mean Scores of the High and Low Groups on the Ten Item "Break Set Scale"†

	High Group			Low Group			t
	N	M	SD	N	M	SD	
All Subjects	90	1.73	1.76	73	1.78	1.89††	0.0017
Experimental Subjects only	60	1.53	1.68	23	2.09	2.26	1.057
Control Subjects only	30	2.13	1.86	50	1.64	1.67	1.176
Subjects matched on IQ	32	1.47	1.60	32	1.41	1.69	0.149

†An increase in score indicates an increase in "disagree" responses
 ††Ratio between group variances for all subjects = 1.1532

break set items. We did not expect any difference on this scale since the Break Set Scale was designed to elicit "agree" responses and not to be used as an index of mental health. It is interesting to observe, however, that for the experimental subjects, the "Highs" have a smaller mean (1.53) on the Break Set Scale than the "Lows" (2.09). For the control group this trend reverses itself and the "Highs" have a larger mean (2.13) than the "Lows" (1.64). However, since the differences are not significant and since the t tests for both the total group and the matched IQ group are nearly zero, we have to assume that chance is operating.

The correlation between the Intolerance of Ambiguity Scale and the Children's Antidemocratic Attitude Scale is $r = .41$ (N 232) significant at the .01 level. This is in agreement with the findings by O'Connor (6) who reported a significant correlation of $r = .55$ between a different ethnocentrism scale and an ambiguity scale which has four items in common with our scale. Thus we can reject the null hypothesis that ethnocentrism is not positively related to intolerance of ambiguity.

SUMMARY AND CONCLUSIONS

From 280 sixth grade subjects a group of 90 high causally and 73 low causally oriented subjects were identified. A series of tests which are, generally speaking, considered as indicative of mental health were administered to all subjects. In this paper, the results for two of these tests, the Children's Antidemocratic Attitude Scale and the Intolerance of Ambiguity Scale, were reported and analyzed. The "Highs" showed significantly less antidemocratic attitude and less intolerance of ambiguity than the "Lows". The differences remained significant if subjects were matched on IQ scores.

In a previous study (5) dealing with the same subjects, the "Highs" differed significantly from the "Lows" in that the former made fewer guesses and guessed later if confronted with perceptual ambiguous stimuli. It was also shown that guesses made by the "Highs" were more in the nature of hunches or hypotheses while for the "Lows" such guesses are more rigid, final and judgmental.

A further study in preparation for publication gives evidence that the "Highs" show less anxiety, more security and more honesty than the "Lows".

The data taken together give support for the hypothesis that high causally oriented children differ from low causally oriented children on such indices of mental health as a perceptual intolerance of ambiguity scale, a verbal intolerance of ambiguity scale, an anxiety scale, a scale of children's antidemocratic attitude, honesty and an observational measure of security.

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