Published as a separate and in *The Journal of Psychology*, 1973, 84, 219-222.

PSYCHOLOGICAL TEST PERFORMANCE AND INDIGENOUS CONCEPTIONS OF INTELLIGENCE* [1]

Institute of Nutrition of Central America and Panama and Brandeis University

ROBERT E. KLEIN, HOWARD E. FREEMAN, AND RICARDO MILLETT[2]

SUMMARY

The psychological test performance of 10 seven-year-old boys from an isolated, rural Guatemalan village was compared with ratings of their intelligence made by 42 adult village members. The adults' judgments were found to correlate strongly with the children's performance on the Embedded Figures, Verbal Analogies, and Memory-for-Designs Tests.

A. INTRODUCTION

Cross-cultural studies of cognitive development frequently employ psychological tests originally developed and standardized on populations fundamentally different in cultural background from the subjects who are subsequently given the tests (1, 2, 3). Little is known about the congruence between scores on tests of intellectual abilities and estimates of intelligence by community members acquainted with the subjects.

The purpose of the present study was to compare, in an isolated Guatemalan village, preschool children's performance on tests of intellectual abilities with estimates of their "intelligence" by adults from their community. This exploratory study is part of a broad investigation of congruence between different social and psychological tests and indigenously judged social-role competence.

* Recommended by Jerome Kagan of the Editorial Board, received in the Editorial Office on April 14, 1973, and published immediately at Provincetown, Massachusetts.

[1] The data for this study are drawn from the Guatemalan growth and development project by Contract #PH43-65-640 of the National Institute of Child Health and Human Development, N. I. H. This investigation is part of a program of collaborative research on Uniform Measures of Social Competence by H. E. Freeman, J. Kagan, R. E. Klein, and A. K. Romney and is supported by grant GS-33047 of the National Science Foundation.

[2] Requests for reprints should be sent to Robert E. Klein at the address shown at the end of this article. The second and third authors are at Brandeis University.

B. Method

Systematic impressions of indigenous conceptions of intelligence were obtained in ethnographic interviews with adult members of an isolated, rural Guatemalan village. Considerable knowledge was available about this community of approximately 1000 Spanish-speaking inhabitants who barely subsist by the consumption and sale of agricultural production. This background information was accumulated as part of a long-term longitudinal study of nutrition and mental development taking place in this and three similar villages.

The most descriptive indigenous term for intelligence is *listura*. This word is most often translated back to English as "smartness." The behavioral characteristics used by adults in the village when describing children who are "*listo*" are "independence," "verbal facility," "good memory," "alterness," and a high level of physical activity.

Ten seven-year-old boys were selected randomly from the longitudinal study and photographed in a standing position against the same background. Randomly selected adults in this village were asked to name the boys in the photographs. This procedure was stopped after 42 judges were selected who knew all 10 boys. Each judge ranked the 10 boys on *listura*. The rankings were obtained by paired comparisons with use of the children's photographs.

A large number of psychological test scores were available on the subjects. Measures of perception, memory, and language were selected for this analysis. These tests will be discussed further in the Results section.

C. Results

There was a high degree of congruence among the ranking of the various judges. Agreement between any two judges averaged about 70%, and the relationship between judged ranks was significant at the .03 level. The rank-order matrix was subjected to multidimensional analyses, and the correlation between the resulting metric scale scores and the rank order was .95, suggesting that the ranks approximated the property of an interval scale. In Table 1, we show Pearsonian correlations between rank order scores and the psychological tests.

Although the values of the correlations are moderate to high, the sample size is small, and thus the confidence limits around the correlations are broad. Nevertheless, the results are provocative.

The *perception* measures are from an Embedded Figures Test. In this test, the child is scored on both how many correct responses he makes in locating figures embedded in complex pictures and the length of time between the

TABLE 1
CORRELATIONS BETWEEN RANK ORDER SCORES AND THE PSYCHOLOGICAL TESTS

Measures	r	p
Perception: *Embedded Figures Test*		
Number of correct responses	.75	$p < .02$
Response time	.49	$p > .10$
Language:		
Verbal Analogies	.57	$p < .10$
Picture Vocabulary Test-Naming	.34	$p > .10$
Picture Vocabulary Test-Recognition	.11	$p > .10$
Memory: *Memory-For-Designs Test*		
Trial 1	.55	$p < .10$
Trial 2	.52	$p > .10$
Trial 3	.61	$p < .10$

item presentations and his responses. Judged *listura* is highly correlated with children's correct test responses, and is moderately related to their response times. It is of interest that there is also a positive correlation ($r = .50$) between children's response time and number of correct responses on the Embedded Figures Test: children who have more correct responses take more time to answer. Thus, although adults emphasize high activity level in describing children who are "*listo*," these children are able to control their response rhythm and contemplate before answering when faced with a complicated task.

Of the three measures of *language*, one is moderately correlated with the judges' ratings. Responses on a Verbal Analogies Test are predictable from adult estimates of *listura*. However, there is a lower correlation between *listura* and the children's ability to name particular objects that appear in a set of pictures, and almost no relation between judge's estimates and recognition of the pictures that correspond with objects named by the examiner. The lack of correlation between judged *listura* and picture recognition is probably due to the relative ease of the task and the lack of variability in test scores.

The final three variables are scores for successive trials on the Memory-For-Designs Test. The designs are made up of four multicolored blocks. Children are given five seconds to study these designs and then must reconstruct them from memory. The correlations between *listura* and memory for designs are strong for all three trials.

D. DISCUSSION

The paired-comparison rating technique used here proved to be very useful. It was easily understood by the illiterate adult judges, and it provided very stable subject rankings.

However, since sample size is extremely small, the findings are only suggestive. Nevertheless, the popular conceptions of intelligence among adults in this rural Guatemalan village do show remarkable congruence with aspects of cognitive performance on tests adapted from batteries developed for use with urban children in the United States.

Expanded research efforts similar to this one may provide more systematic knowledge of the uniform characteristics of cognitive competence across cultures. Cultural variability and congruence in conceptions of cognitive development, along with the relationship of measures of cognitive development to social competence, are critical issues in the field of cross-cultural developmental psychology.

References

1. Cravioto, J., DeLicardie, E. R., & Birch, H. G. Nutrition, growth and neurointegrative development: An experimental and ecologic study. *Pediatrics*, 1966, **38**, 319-372.
2. Johnson, D. L., Johnson, C. A., & Price-Williams, D. The Draw-A-Man test and Raven Progressive Matrices performance of Guatemalan boys and Ladino children. *Rev. Interamer. Psicol.*, 1967, **1**, 143-157.
3. Klein, R. E., Gilbert, O., Canosa, C., & De León, R. Performance of malnourished in comparison with adequately nourished children on selected cognitive tasks (Guatemala). Paper presented at the Annual Meeting of the American Association for the Advancement of Science, Boston, Massachusetts, December, 1969.

Division of Human Development
Institute of Nutrition of Central America and Panama (INCAP)
Apartado Postal 11-88
Guatemala City, Guatemala