

The Construction and Validation of a Group Home Environment Scale

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It is the purpose of this study to construct a statistically valid and reliable scale for the measurement of urban home environment. The scale which results from this study should differ from the scales constructed in the past particularly in that it attempts to measure the home environment by securing the necessary information from the child, thus making unnecessary the relatively slow and expensive practice of calling individually upon each home for the desired information. This scale should be suitable for group administration in the public schools under classroom conditions similar to those under which group intelligence and achievement tests are given.

The scale is intended to be of value in psychological, sociological, and educational diagnosis of the child and in curricular and extra-curricular guidance of the child. In addition to this useful purpose, which it should be capable of serving in any school system, it should also be useful in scientific study of relationships between home environment, personality, attitudes, intelligence, and other variables.

Thus far, the scale has been used only at the high school level; it is probable that it will be found useful at the lower levels, this, of course, must be determined by further experimentation.

Construction of the scale.—Since it is the avowed purpose of this study to produce an instrument which will measure the home environment in as many of its significant aspects as is practicable, the selection of relevant items is deliberately inclusive. Yet, although the elements of home environment touched upon by these items cover a wide range, a high degree of validity for almost every item in the scale is fairly certain; this is partly due to the use in this study of the discoveries of previous scholars who have attempted to measure home environment. Naturally, items which previous research have shown to have desirable discriminating power have also been given preference in this research. A majority of the items selected are of the objective single-statement, possession-non-possession type; some are original, some gathered from previous research, and all have been evaluated by a seminar of graduate students. All of the items are questions of fact which require objective responses. Typical items are such as these:

Is there a factory, railroad, or warehouse within two blocks of your home?

Are there any flowers or shrubs in front of your home?

Is there a piano in your home?

Does your family have an automobile?

Have you ever paid money to belong to any organization such as Boy or Girl Scouts, Boys' Club, 4-H, Hi-Y, YMCA, YWCA, etc.?

Most of the items are measures of aesthetic, cultural, economic, or social aspects of the home environment. Literary content of the home is measured by items covering books, newspapers, and magazines. One part of the scale measures the cultural level of the home as indicated by the magazines taken in the home; in order to secure this latter measure, it was necessary to assign weightings to popular and representative magazines, each magazine being weighted in proportion to its own cultural value. In order to secure a cultural weighting for each magazine, a list of 101 representative magazines was prepared and given to each of 44 competent judges, each judge being directed to assign a weight of 1, 2, 3, 4, or 5 to each magazine in accordance with his opinion of the cultural value of that magazine. The split-half reliability of the ratings of these 44 judges is $.96 \pm .02SE$. On the basis of the mean rating for each of the 101 magazines as assigned by these 44 judges, the cultural weights were assigned to the magazines. The 75 most representative magazines were then grouped into four cultural classes with a weight of 1, 2, 3, or 4 assigned to each magazine. In the scale, the child is directed to check each magazine taken in the home and the mean cultural weight of the magazines checked is taken as one of the more important measures of the cultural status of the home. The four classes include the following magazines. Magazines in the highest class which received a weighting of 4 include (the name of each magazine is followed by the mean rating of 44 judges):

Saturday Review of Literature 4.63, National Geographic 4.50, Harper's 4.50, Forum 4.50, Current History 4.45, Nation 4.44, Time, 4.42, New Republic 4.39, Reader's Digest 4.37, Etude 4.33, North American Review 4.21, Survey Graphic 4.19, American Mercurv 4.10, School and Society 4.00, Living Age 4.00, Frontiers of Democracy 3.93.

In the second class, magazines which received a cultural weighting of 3 include:

Scientific Monthly 3.87, Scientific American 3.86, Better Homes and Gardens, 3.71, Theater Arts Monthly 3.65, Asia 3.65, Life 3.63, Nation's Business 3.63, Travel 3.58, Harper's Bazaar 3.56, Hygeia 3.54, Vogue 3.53, House Beautiful 3.53, United States News 3.52, House and Garden 3.51, American Home 3.48, Parent's Magazine 3.45.

In the third class, magazines which received a cultural weighting of 2 include:

Good Housekeeping 3.39, Ladies' Home Journal 3.39, American Magazine 3.29, Look 3.28, McCall's 3.26, Cosmopolitan 3.23, Saturday Evening Post 3.20, Woman's Home Companion 3.15, Popular Mechanics 3.14, Outdoor Life 3.11, Pathfinder 3.09, Field and Stream 3.00, Redbook Magazine 2.97, National Sportsman 2.86, Collier's 2.83, Sports Afield 2.33, Radio Guide 2.24, Physical Culture 2.15, Liberty 2.13, Photography 1.93.

In the fourth class, magazines which received a cultural weighting of 1 include:

Argosy 1.86, College Humor 1.80, Screenland 1.63, Silver Screen 1.39, Western Story Magazine 1.26, Sweetheart Stories 1.24, Real Detective Magazine 1.20, Thrilling Adventures 1.15, True Story 1.14, Thrilling Detective 1.10, Thrilling Love 1.10, Thrilling Western 1.10, Ranch Romances 1.08, True Romances 1.06, True Confessions 1.06, Breezy Stories 1.00.

Incidentally, the correlation between cultural weightings and subscription price per year for the above magazines is $.55 \pm .09SE$.

An innovation introduced in this new scale is that of the cultural and economic pictocontinuum; units on this picture continuum may be either qualitative or quantitative. A cultural pictocontinuum of four quantitative categories is used to measure the number of books in the home. Even more interesting is the economic pictocontinuum which is used to measure the quality of chairs in the home; this latter continuum contains pictures of twelve representative chairs. The assumption was made that although there are many variations in types of chairs there are probably only a few popular basic kinds of chairs; these chair types were obtained from the fall 1939 catalogue of a large mail order business and the weighting assigned to each chair was computed on the basis of the mean retail price of all chairs of its kind in the Sears-Roebuck catalogue.

Other items in the scale include measures of housing, educational status, and occupational status. Housing status is obtained by dividing number of rooms in the home by the number of persons in the home. Educational status of parents is the mean score of both parents, each parent receiving a score between 0 and 5 according to grade level reached in school. Occupational status is simply the specific occupation of the father; when the scales are scored after administration, each occupation is given a weight depending upon classification as unskilled, semi-skilled, skilled, business and managerial, or professional.

All of the items just described were divided by the authors into four categories or sections. Section I measures the aesthetic level, Section II the cultural level, Section III the economic level, and Section IV the community prestige of the home. The latter section is intended to get at an important affective factor in the home—the ascendant atmosphere of the home as indicated by presence of elements which tend to raise the prestige of the family in community, neighborhood, or ethnic group. The first section is intended to measure the presence of certain objective elements in the home which should tend to provoke attitudes of aesthetic appreciation in children. The four sections will be regrouped later according to the results of a detailed item and factor analysis.

Administration of the tentative scale.—When completed the scale was administered to a population composed of high school seniors representing approximately 1,300 homes in Gary, one of the largest cities in Indiana. This population, containing considerable racial, national, religious, political, and socio-economic diversity, is divided into seven different high schools, each school differing notably from the other schools in the type of urban sociological area which it represents. Only high school seniors were used in order to exclude possible systematic differences which might be related to age of children reporting.

In each school the scale was administered to the seniors while they were gathered in a general assembly; they were given the following directions: "You are to answer the following questions about your home. Answers which you make will not influence your standing in any class

or course. Be accurate. You are to answer each question by encircling the true answer."

Investigation of methods of scoring the scale.—There are several possible methods of weighting the single statement items in the scale. The simple method is simply that of assigning one point for possession of the desirable item and zero for non-possession of the item. The differential method is based on the logical assumption that all items are not equally important or valuable to the home environment and that therefore items should be weighted in accordance with their cultural, economic, or other environment value. The sigma method is based on the assumption that desirable items which occur relatively frequently in the home environment should be weighted proportionally less than desirable items which occur less frequently. The latter method is rejected in this study because of the obvious probability that many desirable items which occur relatively frequently actually have greater cultural or economic value than many desirable items which occur relatively infrequently.

Simplicity and ease of scoring favor the simple method; however, on the possibility that a differential scoring system might yield scores significantly different from those yielded by the simple method, a differential system was worked out. Twenty competent judges were each given a list of the 65 simple-statement items in the scale and instructed to give each item two weightings of 1, 2, 3, 4, or 5 according to, first, cultural value of the item, and, second, economic value of the item. Thus two sets of mean ratings were secured for all the items. The split-half reliability of the judgments of cultural values is $.89 \pm .03SE$ and same for the economic values is $.93 \pm .03SE$. Having obtained a set of cultural weightings and a set of economic weightings for all items, the next step was to determine whether or not the two sets of weightings were closely enough related to justify combining them into one set of environmental weightings; as a matter of fact the correlation between the set of cultural weights and the set of economic weights is $.88 \pm .03SE$, which is increased to $.98$ when corrected for attenuation. This correlation was regarded as high enough to justify the combining of the two sets of weightings. The resulting differential weight for each item is therefore the average of the economic weight and the cultural weight

Finally, 100 of the papers from the group administration were selected at random from the entire population and each paper was scored according to, first, the simple method of scoring, and, second, the differential method of scoring. When the two sets of scores for the 100 randomly selected homes were correlated, the relationship was found to be $.97 \pm .006$, which was interpreted as adequate justification for adopting the simple method of weighting as the scoring system for this home environment scale. Apparently it makes little difference which method of scoring is used except that the differential method is considerably more uneconomical to use because of its relative complexity.

Analysis and validation of the scale.—The problem of validating the scale has been attacked from two angles. Both colored and white uni-

versity women's (composed almost entirely of school teachers) organizations in the subject city volunteered to make personal calls upon a sampling of the total population of homes represented by the 1,300 scales which were scored by high school seniors; these home-callers were instructed to go into each home, observe the home, interview a parent, and, while still in the home, fill out one of the home environment scales. Members of the white organization have at yet submitted no scales, but members of the negro organization called upon a total of 22 homes and filled out scales which may be compared with identical scales which were scored in group administration by children from the same 22 homes. The correlation between these 22 home scores and 22 group administration scores is $.80 \pm .05SE$; this correlation coefficient could be raised slightly by correcting for attenuation in the criterion scores.

The second measure of validity was secured by a more unique method. First, the mean home environment score of each of the seven high schools was obtained. Six of the seven high schools had senior enrollments ranging from 150 to 274, but the seventh high school, small and in a newly developed part of the city, had only 18 seniors; with so small a population in this latter school it is probable that the mean home environment score of this school is not representative of the mean socio-economic level of the neighborhood in which the school is located; however, much greater confidence can be placed in socio-economic interpretations of data obtained from the six large schools. Second, 20 prominent school officials ranked the seven schools after reading the following directions: "You are requested to rank the seven Gary high schools in order, from 1 to 7, from the high school possessing the smallest proportion of students from homes of high socio-economic status to which you will assign a rank of 1 to the high school possessing the largest proportion of students from homes of high socio-economic status to which you will assign a rank of 7, with the other five schools being assigned ranks 2, 3, 4, 5, and 6." The reliability of these rankings from 20 judges as shown by average intercorrelation was .96. From these 20 rankings a mean ranking for each school was obtained. Finally, the mean home environment score of the schools which were obtained from group administration of the scale were correlated with the mean rankings of the schools which were obtained from the ratings of 20 judges. When the small high school of only 18 enrollment is excluded from the computations, the rank difference correlation between the group administration averages and the average judge ratings is 1.00; if the small high school is included—and there appears to be ample justification for excluding it—the correlation is lowered to $.81 \pm .11SE$.

The problem of ascertaining the reliability of the scale was also attacked from two angles. First the reliability of the scale was determined by split-half techniques with a sample of 200 of the 1,300 papers. The reliability was found for each of the four sections (.37, .58, .47, and .56 respectively); using Lindquist's method of z transformations and weighting each correlation for number of items in its section an average correlation of .51 was obtained. This correlation represents the reliability coefficient of a scale $\frac{1}{4}$ the length of the present scale, therefore applying

the Spearman Brown prophecy formula to this r of .51 for a test four times longer, a reliability coefficient of .81 is obtained for the total scale. The split-half reliability for the entire scale, using the Spearman-Brown formula for a scale twice as long, is $.84 \pm .03SE$.

Second, a measure of reliability was secured by isolating all twins and siblings in the total population of 1,300 and correlating these pairs of scores from the same home; 29 such pairs were obtained from the total population and the Pearson product-moment correlation for same was found to be $.66 \pm .10SE$, but the interchangeable correlation was .57. However, when three poor items were dropped from the scale, this correlation was increased to .86.

Although an intensive item analysis has not yet been performed practically all items in the scale are indicated to be valid; one exception is the chair pictocontinuum which under the present mean method of scoring fails to discriminate satisfactorily; the correlation between the mean chair scores and the remaining items in the economic section is $.20 \pm .09SE$. This item was dropped from the scale.

Correlations which have been computed between parts of the scale include that between the average magazine score and the total environment score with 1,304 cases, which is $.45 \pm .02SE$. Correlation between occupation of father and total environment score is $.59 \pm .02SE$. Correlation between total environment score and education of mother is $.45 \pm .02SE$; between total environment score and education of father the coefficient is $.48 \pm .02SE$. The aesthetic (I) section correlates $.43 \pm .02SE$ with the cultural (II) section. Aesthetic section correlates $.43 \pm .02SE$ with the economic (III) section. Between aesthetic section and the community prestige (IV) section, the correlation is $.44 \pm .02SE$. Cultural section correlates $.44 \pm .02$ with economic section. The cultural section correlates $.52 \pm .02SE$ with community prestige. The correlation between the economic section and community prestige is also $.52 \pm .02SE$. An additional correlation between total environment score and number of children in the family yields a coefficient of $-.19 \pm .03SE$.

When an intensive item analysis is completed and certain items are discarded with consequent regrouping of items, it is expected that this scale will prove to be a valuable instrument in helping to give the school a better understanding of the child as well as in assisting in the study of many variables potentially related with home environment.