Recreational Activity Clustering Among Adolescents

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Data on participation in 15 recreational activities were obtained from a sample of 2,760 junior and senior high school students. Interrelationships among activities were examined by use of a hierarchical clustering procedure for males and females within each of the following four age groups: 11–12, 13–14, 15–16, and 17–18.

The data indicated that the two a priori designated clusters of outdoor recreation and competitive recreation activities were of limited value for categorizing interrelated activities. However, the clustering procedures suggested that if the outdoor recreation and competitive recreation clusters were defined more narrowly, many of the activities within them did interrelate. A third group of activities emerged which had a very low relationship to the other two clusters and to each other. They were given the generic title "unique recreation activities" to indicate their relative independence.

Key words: adolescents, recreational activities, activity clusters.

Leisure interests are the focal point of many young people's lives (Carter 1968). Sports and outdoor recreation activities are an important subset of these leisure interests. Such activities play a substantial role in facilitating peer group status, prestige and role structure among adolescents (Jones 1946; Tuddenham 1951; McGraw & Tolbert 1953; Gordon 1955; Coleman 1961).

An earlier study by Crompton, Lamb and Vedlitz (1979) reported differences in participation in outdoor recreation activities between male and female adolescents and between different adolescent age groups. The age variable was significant at the 0.01 level for eight of the nine outdoor recreation activities investigated. The sex variable was similarly significant regarding five of the activities. The study suggested...
that it may be inappropriate to regard outdoor recreation participation as consistent or homogeneous throughout adolescence, since there exist a number of relatively narrowly defined age cohorts within that stage.

This study represents an extension of the earlier study in two ways. First, it seeks to identify patterns of interrelationships among adolescents' outdoor recreation activities, within age and sex cohorts. Second, it extends the investigation beyond outdoor recreation activities by including competitive recreation activities to determine whether or not there is stability across adolescent age and sex cohorts among groups of related sport and outdoor recreation activities.

If relatively strong relationships between activities are identified, and if they remain stable across age groups, perhaps activities may be substituted for one another without substantially reducing the satisfaction an individual derives from participation (Hendee & Burdge 1974). Further, the theory of continuity holds that if the activities of youth are known, it is possible to predict activity patterns throughout life (Sessoms 1980). Leisure researchers have produced a body of empirical evidence suggesting that an individual's choice of leisure activities in childhood and in adolescent years is a useful predictor of adult recreation patterns (Hendee, Callon, Marlow & Brockman 1968; Bevins, Bond, Corcoran, McIntosh & McNeil 1968; Burch 1969; Soffranko & Nolan 1972; Yoesting & Burkhead 1973). This suggests that identification of related activities among adolescents will suggest potential substitutable activities, not only for present adolescents but for future adult populations. The conceptual development of this thesis has been fully explored in an earlier paper in this journal by the same authors, and for that reason is not repeated here (Crompton, Lamb & Vedlitz 1979).

Methodology and Procedures

A self-administered questionnaire was given to 2,760 junior and senior high school students in Garland, Texas in the spring semester. The students were asked to report how many times during the past year they had participated, outside of school, in fifteen recreational activities considered by education and recreation leaders as most likely to be available to adolescents in the community.

Based upon the findings of previous researchers (Witt 1971; Hendee & Burdge 1974); boating, fishing, canoeing, picnicking, camping, horseback riding, bicycling, hiking, and swimming were designated, a priori, as outdoor recreations. Golf, baseball/softball, racketball, tennis, basketball, and football/soccer were designated as competitive recreations.

The sample size represented 17.4% of the total 11–18 year-old enrollment in the school system. Garland is a relatively homogeneous middle-class suburb of Dallas. The population is 96% white; 42% of all residents are under the age of 18. Given the relative homogeneity of the community, it seems reasonable to assume that the sample is representative of Garland's adolescent population. (For a more detailed discussion of sample selection procedures, limitations of the sample, and the justification for using recall data of this type, see Crompton, Lamb & Vedlitz 1979).

It was reasoned that the characteristic desire of adolescents to develop new interests (Rapoport & Rapoport 1975) is facilitated by changes in the school milieu as they move from junior to senior high school. The change in school may be considered to have a useful demarcation point for differentiating between early and late adolescence. Accordingly, for the purpose of this study, respondents were grouped into four age categories: 11–12 (n = 575), 13–14 (n = 1035), 15–16 (n = 701), and 17–18 (n = 469).

In each age category males and females were represented relatively evenly. The total sample was comprised of 1,354 males and 1,406 females.

Analysis

Pearson's r correlation coefficients were computed to assess interrelationships among the fifteen activities for both male and female samples in each of the four age groups. A review of the correlation matrices indicated that few of the fifteen recreational activities related at very high levels in any of the adolescent age and sex cohorts. Although the r coefficients were far below the maximum, the obtained values were not considered unusually low when viewed from the perspective of values obtained in other studies of recreation activities (Buse & Ensh 1977) or even in other behavioral fields such as sociology (Blau and Duncan 1967). Nevertheless, if the two or a priori designated activity categories were reasonably exclusive, the within group correlations for both the nine outdoor recreation activities and the six competitive recreation activities would be comparatively high. In contrast, the correlations between activities across the two activity categories should be comparatively low.

Analyses of the mean within group correlations by sex and age cohort were relatively low, ranging from .24 to .35 for outdoor recreations, and .15 to .27 for competitive recreations. The mean between group correlations ranged from .13 to .29. These results indicate that outdoor recreations and competitive recreations were not mutually exclusive clusters of activities among this adolescent population.

Development of Activity Clusters

Since the data indicated a discrepancy between the empirical inter-relationships obtained and the two or a priori designated activity categories, a decision was made to investigate the nature of the activity interrelationships in more detail without the a priori constraints. A hierarchical clustering procedure was used to develop activity clusters with the correlation coefficients serving as the input data (Johnson 1967). The use of hierarchical clustering rather than factor analysis was perceived to have at least two advantages. First, it provided for observation of direct relationships between activities, rather than the relationship of each activity to some underlying, imaginary, common dimension. Second, cluster analysis facilitates the measurement of the strength of the activity relationships between and within clusters, and graphically displayed these relationships.

The Johnson hierarchical procedure starts by placing each point in its own cluster. In this case there were 15 unit clusters. At the next level there is a search of the dissimilarity matrix for the smallest value, that is, the two profiles that are closest together. This pair of profiles form the first cluster. At the next level, a third point joins the first two or a second two-point cluster is formed, based upon various criterion functions for assignment. Eventually all points are grouped into one large cluster (Johnson 1967). Separate hierarchical clusters were developed for each sex at each different age group level. These are exhibited in Figures 1 and 2.

The clusters may be interpreted in the following way. Using Figure 1, females, age 11–12 as an example, the figure may be viewed as a group of tree branches, growing from left to right. The joining of activities, or branches, into clusters is indicated by the vertical lines. The closer activity clusters or activities join to the right of the figure, the stronger their relationship to one another. The length of the lines and the correlation coefficients they represent are scaled at the bottom of each cluster.
Figure 1 — The Hierarchical Clustering of Selected Recreation Activities in Four Age Groups of Adolescent Males.
presentation. The shorter the length of the vertical line from the right of the figure, the stronger the correlations between the activities and activity clusters joined by that vertical line. In this figure, for example, the point at which biking and swimming join is the shortest vertical line from the right, because this is the strongest activity correlation. Dropping down from the vertical joining line to the correlation level indicator at the bottom of the figure, the correlation between these two variables is approximately .64. The level at which the cluster “biking and swimming” joins with the variable tennis to form a new cluster is somewhat further from the right of the figure and thereby a weaker correlation—in this case approximately .385.

Although the relationships are not very strong, the nature of the clusters suggests that there is an affinity between some activities within the outdoor recreations and the competitive recreations sets. The groupings are not, however, as strong or as broad as had been originally hypothesized. The data do suggest that this modest affinity remains fairly consistent across age groups. Complete consistency across age groups was not expected. A primary distinguishing feature of the leisure activity patterns of adolescents is their kaleidoscopic involvement in a wide range of different activities. This contrasts with other life cycle stages in which activity patterns are considered to be more stable and predictable (Godfrey and Parker 1976).

Differences in the activity interrelationships were observed between males and females. In the female sample, three activities clustered together in each of the four age groups. They were picnicking, swimming, and hiking. Biking was clustered with these activities in three of the four age categories, as was camping. Generally, picnicking, swimming, hiking and biking may be characterized as being easily accessible to adolescents, with few constraints to satisfying participation for that age group. Facilities are likely to be readily available; travel, equipment and use costs are low; minimal levels of skill are required; and these activities lend themselves to family as well as peer participation, so that if adolescents move from a family centered leisure milieu to a peer centered leisure milieu participation in these activities will not be disrupted. The relationship of camping to picnicking, swimming, hiking, and to a lesser extent, biking, may be explained by their complementary relationships. An adolescent camping experience is likely to facilitate participation in these other activities.

For the male sample there were no clusters of outdoor recreation activities consistent across age groups of the size found in the female sample. However, there were some interesting patterns. In the male sample, there was more clustering on water-based outdoor recreations. The clusters were small, but boating and fishing, picnicking and swimming, and swimming and fishing clustered in three of the age groups. Again, the first two relationships may be partially explained by the complementary nature of the activities, but the explanation for the relationship between swimming and fishing is less obvious.

The second clustering of related activities exhibited by the data was organized sports. In most age groups of both sexes this set was comprised of baseball/softball, basketball, football/soccer, and tennis. In the male sample, these activities also tended to cluster with biking and hiking. The reasonably consistent grouping of the four core activities in this set across the age and sex variables indicates that if a respondent participated in one of these individually popular ballgames, there is a good chance that he or she also participated in the other three. The hand-eye coordination required by each of these activities translates so well to the others that if an individual is sufficiently skilled to enjoy participation in one of them, he or she is likely to participate in one of the traditional ballgames all year round.

A third group of three activities consistently emerged in each age group in the female sample, and also in two of the four age groups in the male sample. These activities were racquetball, golf, and canoeing. These activities had a very low relationship not only with the other two clusters, but also with each other. The distance of their relationship to each other along the horizontal axis implies that they may most appropriately be considered as unique activities, independent of each other and of the competitive sports and outdoor recreations sets. This independence suggests that these are very specialized activities in which participants concentrate almost to the exclusion of all other activities. This group was given the generic title “unique recreation activities” to indicate their relative independence.

**Discussion**

The study sought to identify discrete groups of interrelated activities within four adolescent age groups, and to examine any sex or age differences within these activity clusters. The data indicated that the a priori designated clusters of both outdoor recreation and competitive recreation activities were of limited value for categorizing interrelated activities. However, the clustering procedure identified an affinity between some activities within each of these two categories.

The term “organized sports” may be superior to “competitive recreations” for describing the more narrowly defined set of interrelationships which emerged in the study. This narrower cluster includes baseball/softball, basketball, football/soccer and tennis, but excludes golf and racquetball, which were included in the a priori competitive recreations grouping. However, “outdoor recreations” still appears to remain the most useful term for categorizing the other major groupings of activities because the procedure suggested that only canoeing was inappropriately categorized in this cluster. A third group of activities which consistently emerged had a very low relationship to the other two clusters and to each other. They were given the generic title “unique recreation activities,” to indicate their relative independence. Although their degree of affinity fluctuated across age groups, these three groupings of activities appeared fairly consistently at each level, suggesting that there is a reasonable amount of stability in the interrelationships between activities throughout the adolescent life cycle stage.

The observed similarity of activity groupings of male and female adolescents was not totally unexpected. It is supported by findings reported by others. For example, Rosenberg and Sutton-Smith (1960) reported that girls were increasingly coming to prefer what were formerly male play activities. They found that traditionally male games such as baseball, soccer and camping did not show significant differences between the sexes. Child and Child (1973) commented that this change over time did not represent such a convergence of the play roles of the two sexes as an expansion in the scope of girls’ leisure activities. It seems likely that this trend has continued since the Rosenberg and Sutton-Smith study, and has been accelerated by the more recent Title IX regulations which require that males and females be given equal recreational opportunities in school systems (Greendorfer 1977).

It was suggested in the introduction to this paper that an important implication of demonstrating the interrelatedness of recreation activities is the possibility that activities in the same cluster provide similar satisfactions. Thus, for some people, certain of these activities may be substitutable with little loss of satisfaction (Hendee & Burdge 1974). While the complementary/substitutability issue was not specifically addressed in this study, the clustering of the activities lends itself to interpretation in
these terms. For example, the relationship of camping to picnicking, swimming, and hiking may be classified as complementary. In contrast, the four activities constituting the core of the organized sports cluster are considered substitute activities, since they require similar skills and are not perceived as being contingent upon each other.

The similar cluster patterns exhibited by males and females suggest that in terms of the range of activities pursued, the future "leisure careers" of the sexes may be similar. The broadening of the female activity range and the narrowing of the male activity range shown by the data as adolescent age increases indicates that female leisure careers may be more eclectic than those of males. Males are more inclined to cease participating in competitive recreations than they are in outdoor recreations as they reach the higher adolescent age levels. Hence, more carryover into adult leisure may be expected among males in outdoor recreations than in competitive recreations.

Finally, it must be recognized that the "case study" nature of this study limits its generalizability. Garland is a predominantly white, young, middle class suburb of a growing sun belt city. For this reason the results of this study must be regarded as exploratory rather than definitive. Further research, using subjects from different regions, with different backgrounds and experiences, is needed before the findings of this study can be generalized to other adolescent populations.

References


