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ABSTRACT

Because of the limitations of previous related studies, this analysis was undertaken to examine in greater depth the relationship between television viewing, reading performance, and related reading activities. A synthesis of eight statewide assessments and an analysis of the 1984 National Assessment of Educational Progress were designed to examine the displacement hypothesis, i.e., activities are reorganized by children as a result of various media options. First examined was the relationship between television viewing and reading achievement for the statewide assessments; then, a more in-depth analysis of displacement was done by examining leisure reading and free time activities outside of the school context. Findings indicated that: (1) television viewing accounted for little variance in reading achievement; (2) television viewing did not displace the time spent in leisure reading; and (3) the amount of television viewed was not related to the displacement theories of functional similarity, physical and psychological proximity, and marginal fringe activities. Other studies plus this large scale secondary analysis indicate there are no deleterious effects of television on learning achievement, and it is suggested that future research should focus on other issues. Appended are 15 tables. (8 references) (CGD)

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Television and reading: A research synthesis

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Paper presented to the 1986 International Television Studies Conference

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Television's influence on reading achievement and school learning continues to be a major concern to educators and health professionals.The research literature, for the most part, consists of small-scale studies conducted with different age groups using diverse methodological strategies (Adams & Harrison, 1975; Hornik, 1978; Moldenhauer, & Miller, 1980; Morgan, 1980). As a result, there has been a lack of convergence across studies regarding the relationship between television and learning. Not unlike other fields of inquiry, however, two schools of thought have emerged: one which claims that there are no apparent effects, and the second, that the strength of the effects have been masked due to flaws in research designs.

Unfortunately this polarization has seriously limited progress in the field. Study designs often reflect researcher bias by assuming deleterious effects of television on learning. Most studies have not distinquished between different styles of learning and different media preferences. Furthermore, various research communities have tended to study only one aspect of the television-learning issue. For example, psychologists have developed important theories of how children comprehend information from television. Mass communications researchers have analyzed the functions of the media. This traditional specialization among disciplines, however, fails to relate the

parts to the whole. A dominant paradigm integrating information from cognitive psychology, education, and mass communications research does not exist.

In the light of these differences in research design, results, and methods of collecting data, the corpus of studies relating televiewing to reading achievement has left a number of important questions unanswered. Clearly the most important of these questions continues to be the issue of displacement. Does the time spent watching television displace reading time, and in the long run affect reading achievement? Are certain areas in reading more affected than others? Is there a differential effect for students at various age levels? Would children spend more time on leisure reading if it were not for television?

Our work began as an extension of the meta-analysis conducted by Williams, Haertel, Haertel, & Walberg (1982) on the impact of leisure-time television on school learning. Their synthesis indicated minimal effects between televiewing and achievement. However, most of the studies in the meta-analysis reported only simple bivariate relationships between the two media. Few studies controlled for background variables. In addition, most studies only analyzed achievement scores and time spent watching television. There was little information available to measure the relationship between out-of-school leisure time activities

and television viewing. We also questioned whether an analysis of school learning in general (which included reading vocabulary, spelling, mathematics, social studies and science) might mask effects on specific areas of school achievement such as reading. This analysis, therefore, was designed to examine the relationship between television viewing, reading performance and related reading activities in greater depth.

The theoretical assumption underlying most studies of television and reading achievement is one of displacement. Displacement effects refer to the reorganization of activities by children as a result of various media options. In the case of television, it implies that children tend to substitute television viewing for other activities that they would normally be engaged in during that time. Our review of the studies of the introduction of television in a community have even further articulated this hypothesis (Brown et al., 1974; Furu, 1971; Himmelweit et al., 1958; Schramm et al., 1961). These studies suggest that displacement may take the following forms:

1. Functional similarity: Children will sacrifice those media activities appearing to satisfy the same needs as television, only less effectively. This theory suggests that the time spent with other media, book reading, movies, radio, records, newspaper might be negatively associated with time spent watching

television.

2. Physical and psychological proximity: Children will sacrifice those activities which share the same physical space and provide more satisfaction. This hypothesis suggests that homework, household chores and family responsibilities might be negatively related to the amount of television viewed.

3. Marginal fringe activities: The more casual, unstructured activities, such as playing with friends, outdoor activities are more likely to be displaced. Therefore, informal activities such as getting together with friends, according to this hypothesis, might be sacrificed for television viewing but homework would not.

4. Functional reorganization: Children's media interests might change over time. As they grow older, children will lean toward those media that serve particular functions and that allow them increasing control, in terms of the selection of content and its accessibility. This hypothesis suggests a restructuring of media patterns across different age groups.

This study analyzes these hypotheses in terms of the television viewing-reading relationship. To answer our questions, data from eight statewide assessments and the 1984 National Assessment of Educational Progress were analyzed. Combining eight separate

statewide data sets, we examined the pattern of reading and viewing behavior of over two million students in elementary, intermediate and secondary grades. By standardizing scores, it was possible to identify broad trends regarding the relationship between the two media and to relate the magnitude and direction of the relationship to characteristics such as grade level, and socio-economic status. By using the 1984 National Assessment, in particular, profiles of leisure activities and their relationship to television viewing for three subgroups in the sample were measured.

The use of state-wide assessments had several advantages over other studies conducted on television viewing and reading achievement. First, of course, is the size of the sample. Together, these studies represent a significant database from all geographical locations in the U.S. Second, is the use of a standardized dependent measure. In one state, Rhode Island, a well-known reading achievement test was used to assess vocabulary, comprehension and study skills (Iowa Test of Basic Skills). In other states, an objective-based test was constructed and standardized usually based on the NAEP reading and writing test. Third, is the range of students. These data represent students at all levels of schooling and thus show the patterns of media preference as they change over time.

There are a number of limitations as well. For one, the demographic and attitudinal information was self-reported in items accompanying the test. There was no opportunity to observe students' reading or viewing habits either in the home or at school. Two, only the amount of television watching was assessed. No other television-related behaviors were measured. Third, IQ information was not available and the socio-economic variables, in some cases in particular, were weak.

This analysis, therefore, cannot predict causal connections. We will not be able to show that television 'causes' poor reading achievement. Neither can we say that television stimulates interest in other activities that 'cause' more leisure reading. But this analysis can determine the magnitude of the relationship between television viewing, reading achievement, and leisure reading for children at different age levels. It can also describe common leisure behaviors associated with those children who tend to watch a good deal of television as opposed to those who watch little or a more moderate amount. To this extent, this analysis is likely to provide a sound basis to accept or reject the displacement hypothesis.

Sample

In February, 1983, a letter was sent to the 50 state departments of public instruction in research and evaluation in the United States, requesting information on their statewide assessment measures. Specifically, we were interested in whether an attitudinal measure, containing a television-related question was included along with the overall reading assessments. All 50 states responded to our inquiry. Nine of these states reported conducting a statewide test in reading with an accompanying attitudinal measure. Eight states were able to provide us with a data-tape which included either the complete sample of students or a representative sample.

The characteristics of the assessments are reported in Table 1. Two states, Pennsylvania and California, used matrix-sampling, a method whereby each student takes only a portion of the total number of items for every subskill, broadening the scope of the instrument, while decreasing the time of administration. The grade levels measured ranged from grades 4 through 12. The objective-based tests considerably across assessments according to the number of items and the relative emphasis of skills. Comprehension items were far more numerous than the number of items in other categories.

As part of each state's attitudinal measure, students were requested to report the average amount of television viewed on a daily basis. This question was phrased in a number of ways. Several states requested information about the previous days' viewing. Other states asked only for weekday viewing information. In addition, different scales were used to measure the time spent viewing. California, for example, used a five point scale at grade 6, a seven point at grade 12, ranging from 1/4 hour of viewing to six or more hours. Connecticut asked students to report their televiewing behavior per day on a five point scale from less than 1 hour of viewing to more than 4 hours.

Socio-economic status was a control variable of interest in a number of studies in the sample. Here, again, the questions varied widely. Several states attempted to include a measure asking students the number of various items in the home (such as books, TV's, typewriters) as a broad SES measure. Pennsylvania included the most comprehensive indicator, requesting information on the mother's and father's occupation, educational level, and educational expectations. A number of states did not ask for any SES information.

The National Assessment of Educational Progress in reading and writing for 1983-1984, commissioned by the Federal Office of

Education, was also included in this analysis. Designed to measure educational progress for students ages 9, 13, and 17, this assessment provided a broad portrait of students' reading skills and attitudes toward reading. The assessment was designed to be generalized to an entire national population. Using a powerful variant of matrix sampling called balanced incomplete block spiralling which allowed for greater coverage of reading and attitudes, a larger pool of attitudinal variables were measured. The NAEP study, therefore provided additional information regarding outside academic and leisure activities and their possible linkage to television viewing and reading achievement.

Procedure

All information including the test booklets, summaries of assessment reports and data-tapes was requested from each state. Test booklets were examined and categories of skills in the broad areas of vocabulary, comprehension, and study skills were developed. For those states using matrix sampling, individual test booklets (California used 16 at grade 6; 18 at Grade 12) were analyzed. Due to the varied interpretation of what constituted these subskills in different states, each item on all tests was read and categorized. Broadly defined, vocabulary items included measures of word meaning; comprehension related to

main ideas and their applications, and study skills, to finding and interpreting information from other resources.

The grade levels measured in the assessment were grouped into class intervals: elementary (K-5), intermediate (6-9), and high school (10-12). The states were coded according to geographical location. Mean hours of viewing per day were recoded to establish specific number of hours. For example, responses of 0-1 hours, were recoded as .5 hours. In addition, scales were recoded to ensure that the numbers in each study indicated a similar direction. SES information was coded as a control variable when available according to the scale provided in each state.

Using the random function of the SAS program, we reduced the sample size of Michigan and California to include approximately 18,000 in each sample group. To summarize statistically the results of the assessments, all scores had to be expressed in a common scale or metric. Subskill scores for each grade level were standardized (mean of 0, S.D. 1) by calculating z scores from average distributions, and weighted according to sample size [1]. These standardized scores were placed on one data-tape to

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1. Whenever possible, dependent variables, vocabulary, comprehension, and study skills were regressed on socio-economic status and residuals were plotted against TV time

synthesize the results of the television viewing-reading achievement relationship.

The National Assessment of Education Progress was analyzed apart from the statewide assessment measures. Our intent here was to examine the relationships between reading performance, academic and leisure activities with television viewing as a method of testing the different theories of displacement.

Results

The displacement hypothesis assumes that, given the limited amount of leisure time students have available, television viewing will take precedence over other activities, including those more academic pursuits. In this respect, reading achievement is likely to be affected, as well as time spent on other outside activities.

The results that follow examine this hypothesis in two ways. The first part analyzes the extent of the relationship between reading achievement scores and television viewing time for students at three age levels using the statewide assessments. Following this broad overview, the second part of the analysis is

designed to more closely measure the different theories of displacement. Using the 1984 NAEP study, a large number of leisure and academic activities and their relationship to television viewing for three different subgroups in our population were analyzed. By examining measures related to school performance and leisure activities using two different datasets, these results are able to review the displacement hypothesis and its manifestations in a broad, yet, comprehensive manner.

Reading Achievement Scores and Television Viewing Time

This analysis includes a synthesis of eight statewide assessments in reading and self-reported television viewing time. By combining test results from states all across the country with time spent television viewing, it provides a strong measure of the relationship between the two media. Results are described by grade level to indicate trends in TV viewing at different ages. Reading performance is further detailed in terms of three separate subskills in reading: vocabulary, comprehension and study skills.

Cross-age comparisons of television viewing, noted in Table 2, indicated an inverse relationship between grade level and the amount of time spend viewing. On the average, 1/4 or more of the students at the elementary levels are watching more than four

hours daily. This pattern changes slightly at the intermediate level and quite dramatically at the high school level where a substantial number of students are watching less than one hour per day, and only a small portion are viewing more than four hours. These patterns appear to be consistent with previous research on children's television viewing habits (Brown et al., 1974 Comstock et al. 1978).

But these trends are not all that stable. The data indicate that there is considerable inconsistency among children at the same age level. Michigan, at all three levels, California, at the intermediate and high school levels show significant differences in television viewing time than other states in the sample. Michigan and California phrased the television question quite differently by asking in terms of the amount of time spent viewing 'yesterday'. These differences might then be indicative of the manner in which the item was measured.

However, looking within other states which asked the television question in a similar manner, it is apparent that these variations can not simply be related to differences in the question given. For example, students at the high school level in Connecticut compared to students at the same age in Maine show significant differences in their television viewing habits. Furthermore, these frequencies are not consistent with data from

the NAEP assessments (1980; 1984). The broad fluctuations among students at the same age level suggest that this self-reported item of the time spent viewing television may not be a reliable measure of actual viewing time.

Keeping in mind this limitation, combined regression analyses of the time spent viewing with reading achievement scores were run for all of the eight states in the study. Based on the summary reports of the assessments, there was reason to believe that some of the relationships between television and reading achievement might be curvilinear in form. Polynomial regressions were used to measure curvilinearity by regressing achievement scores on powers of the amount of viewing (see Table 3). To the extent that squared terms contributed significantly to the regression, the results can be interpreted as a description of some degree of curvilinearity.

In accordance with previous findings, the next three graphs show evidence of a curvilinear relationship between the amount of viewing and reading achievement (Tables 4a,b,c). These graphs describe the relationship for all students in the state samples for each reading subskill, controlling for sex and SES.[2]

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2. The vertical axis indicates the standardized reading scores. Note that they are represented in tenths of a percentile to illustrate the shape of the curve. The horizontal axis indicates the number of hours spent viewing on a daily basis.

These tables show a similar pattern. In most cases, students watching relatively moderate amounts of television (between 2-3 hours) had higher achievement scores than those who reported watching less. Scores from Rhode Island and California seemed somewhat atypical from other states. In these two cases, the relationship appeared to be more linear, indicating the more television viewed, the lower the achievement score. Four or more television hours per day appeared to strongly relate to lower achievement scores in all statewide assessments. The shape of the curves seemed similar for vocabulary and reading comprehension subskills; study skills appeared to be somewhat flatter than the other two.

The next three graphs describe the television viewing-reading achievement for each subskill across the three class intervals (Tables 5a,b,c). Note here that the metric for the vertical axis has been changed to reflect a more meaningful unit of analysis. (The area between z= -1 and z= +1 represents approximately 68 % of the normal curve; the area between z= -2 and z= +2, approximately 98%). Beyond the small variations between elementary, intermediate and high school regression lines, these graphs dramatically show the lack of a relationship between the two media. It suggests that the substantive results of the individual statewide assessment reports, as well as the

regression line reported in Williams, Haertel, Haertel, and Walberg (1982) were indicative of small, insignificant differences between those children who spend a good deal of time watching television and those who do not.

The power of this analysis is that, given eight different assessment instruments which measure a broad variation of reading skills, and television viewing, assessed in varied formats, no significant differences were reported across grade levels for the three reading skills. These patterns did not substantially change across different socio-economic status groups, for either gender, or in different regions of the country.

There is reason for expecting that the effects of television might not be evident in reading achievement scores. After all, despite the ability to control for socio-economic status, and gender, there are many confounding variables which might account for differential patterns of achievement. Compared to some of these important factors, such as the home environment, and school-related variables, the number of hours of television watched might appear to exert only a minor influence on achievement in reading and success in schooling.

Reading performance, leisure reading and out-of-school activities

Since television viewing takes place outside of school, we might assume a more direct association between the amount of viewing and out-of-school activities. This second part of the analysis is designed to further test the displacement hypothesis by examining the relationship between reading performance, leisure reading and other activities. The National Assessment of Educational Progress was most appropriate for this analysis. Many background variables were measured which included outside academic and leisure activities. However, as in the case of many secondary analyses, the variables included provide only a partial analysis of each displacement hypothesis. Table 6 lists the variables analyzed for each of these hypotheses in this section.

Functional Similarity

According to the theory of functional similarity, children will sacrifice other media activities appearing to satisfy the same needs as television only less effectively. Book reading, listening to music, newspaper reading, are some of the media activities generally considered to be functionally similar.

The NAEP '84 surveyed a large number of student's leisure time activities. Of these activities, leisure reading was most comprehensively measured. The analysis that follows first

reports the relationship between these leisure reading variables and television viewing, then briefly looks at the other media activities surveyed.

If television is taking time away from other, more academically oriented activities, it is natural to assume that its major influence would be in the area of time spent leisure reading. Table 7 shows the average amount of time spent reading for students ages 9, 13, and 17 from the 1984 assessment. The question on the assessment was phrased in two ways: one focusing on reading during leisure time, and the other, on reading for pleasure. In both graphs, students at the fourth grade level appeared to read the most; at the upper grade levels, interest in books declined, particularly at the high school level. During free time, students as they grow older increasingly read on a weekly rather than on a daily basis.

If students are watching television instead of leisure reading, significant inverse correlations between the two activities should be reported. These correlations would indicate the functional similarity of these activities; that is, given equal opportunity to read or to watch television, children would select the medium that most effectively satisfied their needs. However, Table 8 demonstrates quite powerfully that this is not the case. No significant relationship was reported between recreational

reading and television viewing. Nine-year old students who read the most, also watched the most television per day. Students, at the intermediate and upper grade levels, tended to read as well as watch a moderate amount of television.

Table 9 a,b, and c describe the interactive patterns between reading time, television time and average reading scores for all students in the sample (approximately 28,000). Students who rarely read and watched television at the elementary and intermediate levels, tended to score lowest in reading achievement. Differences in scores at the high school level, however, were significant. Those students who watched six hours or more per day scored lower on their reading performance test than others in the sample. But looking across this graph at the time spent reading, whether on a daily, weekly, or monthly basis, it is evident that the amount of leisure reading did not appear to be related to scores. These data suggest that television is not displacing leisure reading.

The NAEP '84 included additional leisure reading behavior variables. Using Pearson product moment correlations, these variables were analyzed along with the time spent reading and viewing (see Table 10). All the correlations are small, with the exception of one: reading for enjoyment. Those students who enjoyed reading spent their leisure time on the activity . This

finding, of course, is obvious. However, the relationship between time spent reading and enjoyment has often been overlooked. It suggests 'time' may not be the determining variable between whether one choses to read or watch television. Rather, a primary consideration in selecting a media activity might be perceived 'satisfaction'.

Cross-tabulations of other leisure activities were analyzed for three subgroups in the sample: hispanic, black, and white students from the NAEP 1984. These figures describe the media activities students engage in most during their leisure time (see Table 11). Nine and thirteen year old students clearly favored television viewing to other media activities. This pattern changed at the high school level where listening to music became the favorite activity. Reading books received low priority at all three grade levels. Nine year old students appeared to spend time playing video-games but their popularity declined for the older students. None of the students surveyed read newspapers on a regular basis.

Based on this analysis, there is no evidence to suggest that television viewing is displacing other media activities. Even as television viewing declines for the 17 year-olds, time spent reading books and newspapers during leisure time does not increase. To suggest then that students would be reading if it

were not for television viewing is to ignore a fundamental issue that underlies the principle of functional similarity. Media activities, determined to be functionally different from television, tend to remain unaffected by the medium. As a result, time spent leisure reading might be related to a completely different set of needs and gratifications than television viewing.

Physical and Psychological Proximity

According to the theory of physical and psychological proximity, activities most likely to be displaced by television will be those that share a similar space, but do not provide as much satisfaction to the child. Children tend to take the 'path of least resistence'. Given the opportunity to watch television or complete homework, the theory implies that the child will chose to do the easier activity of the two. Consequently, there should be a negative relationship between homework activities and television viewing.

Table 12 describes frequency distributions for three subgroups from the NAEP '84 on homework activities. The question was measured by asking students, "Yesterday, how much time was spent on homework". As might be expected, approximately 1/3 of the students in the fourth grade did not receive any homework. Of those nine-year olds that did, over 40% spent less than one hour

completing assignments. This pattern changes gradually with the older students. Over 1/4 of the 13 and 17 year-olds spent between one and two hours per night on homework activities. Still, the proportion of time spent on outside academic assignments remained rather minimal. More than 1/3 of the students at age 17 were not given or did not do homework the previous night. Differences between the three subgroups were negligible with the exception of students at the high school level. Hispanic students were not assigned or did not complete homework more than the other two groups.

Correlations between homework and reading performance scores were small (.06, .10, .13, for 9, 13, and 17 year-olds respectively). Television viewing and homework were negatively correlated for students at the upper grade levels (-.08; -.10) but again these relationships were small. These results do not indicate a significant relationship between television viewing and homework activities.

Marginal fringe activities

The theory of marginal fringe activities suggests that the more casual, unstructured activities, such as playing, spending time with friends, might be more readily displaced by television viewing than organized activities. From this perspective, we would expect that there would be negative relationships between

the amount of television viewed and other unstructured leisure activities rather than homework, or outside required reading.[3]

Frequency distributions of these unstructured leisure activities are shown in Table 13. Television watching is included to analyze the relative proportion of time spent viewing with other activities. Nine and thirteen year old students watched television more than any other unstructured activity. This pattern changed, however, for students at the high school level. Television watching became subsumed by other, more social activities. These students spent more time involved with friends, and sports activities than the more solitary activity of television viewing. While there are differences among the three subgroups on the relative emphasis of each social activity, this pattern appeared to be consistent throughout the high school level.

Correlations between spending time with friends and television viewing were small (.00, -.02, -.02) for each of the sample groups. This pattern was also reported for the relationship between television viewing and sports activities (.01, .00, -.02). These data indicate that there is no significant

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3. The question on the NAEP test asks "During your free time, which activity do you do the most." While we have included sports among these unstructured activities, we cannot state definitively that they are so.

relationship between television viewing and unstructured leisure time activities.

Functional Reorganization

Unlike the preceding theories of displacement, the theory of functional reorganization suggests a more comprehensive restructuring of activities as a result of television viewing. Rather than provoke piecemeal displacement, this theory hypothesizes that as new media become available, two changes are most likely to take place. First, new media offers new choices; outside leisure activities may become more diverse. Second, new media may displace particular functions of the older media, therefore fostering a change in the communications environment. For example, television tends to serve informational and entertainment functions. Movies, and radio, once serving similar needs, now fulfill more social functions. But media choices are not static. Based on their functionality, people select different options at different times in their lives.

A review of the data presented in this section indicates that media choices change as students become older. Nine year olds spend a good deal of time watching television. These students also play video-games, the new media, however, these games do not appear to have made significant inroads in available leisure time. Television viewing, once such a primary activity decreases

as students grow older. At the high school level, new demands are made on student's time. But these changes are probably not only related to time. Television viewing, reading, and video-games tend to be rather solitary in nature. As students grow older, they seem to turn to more social activities. Music, spending time with friends, and sports become more dominant in their lives. Media choices tend to be related to their social functions.

The theory of functional reorganization emphasizes the individual's role in selecting media. Mass media does not compel certain behavior; rather, the control lies within the individual to use mass media in certain ways. Media use therefore, can be characterized as an on-going process of reorganization, which is fostered by changes in the communications environment as well as changes in the needs of children as they grow older.

Conclusions

This synthesis of eight statewide assessments and analysis of the National Assessment of Educational Progress were designed to examine the displacement hypothesis. The study began by first looking at the relationship between television viewing and reading achievement for the statewide assessments, and then, at a

more in-depth analysis of displacement by examining leisure reading and free time activities outside of the school context.

Individual states' summary reports suggested a negative relationship between the two media: those watching more than 2-3 hours per day showed lower achievement scores than those watching a more moderate amount. But the combined synthesis indicated that these differences were extremely small. Television viewing accounted for little variance in achievement. Rather, it would be more accurate to describe these results as 'null findings'.

Television viewing did not appear to displace the time spent leisure reading. Leisure reading variables indicated that when students defined reading as an enjoyable activity, they tended to do more reading during their free time. This is certainly not surprising. However, it suggests what might really be the issue in the television and reading debate. Children enjoy television and often do not enjoy reading. Instead of blaming television for this phenomenon, it makes sense to try and change this attitude. Children often regard reading as a difficult school subject. We must develop ways to extend their understanding of its compelling uses outside the school setting.

The displacement theories of functional similarity, physical and psychological proximity, and marginal fringe activities did not appear to be related to the amount of television viewed.

Homework, sports activities, spending time with friends seemed independent of the time spent with television. However, it was evident that children's media activities change over grade levels. Changes in activities seemed to be related to the increasing social needs of youngsters at the intermediate and high school levels. These data strongly indicate a functional reorganization of media choices. Activities that give children access and control over their media environment become increasingly important as they grow older.

One limitation of this study, as well as other studies that measure television viewing, is the self-reported nature of the television variable. The variation in scores seen on the statewide assessments suggests that the television variable may lack reliability. Furthermore, these figures of reported television viewing by children tend not be corroborated by Neilson and Arbitron figures. Self-reported items may reflect attitudes toward viewing rather than actual viewing time. Before additional studies are conducted, it is imperative that the validity and reliability of this method of measuring television viewing be analyzed.

It is clear that more research on television, leisure reading and achievement is needed. But media effects studies, that is, research that analyze the predictive nature of the relationship

between the two media, are not needed. In addition to a large number of individual studies reviewed, a meta-analysis (Williams et al.) and, now, this large-scale secondary analysis indicate that there are no deleterious effects of television on learning achievement. On this basis, it seems reasonable to recommend that researchers refrain from producing additional studies of this nature. Rather than continue to describe what 'is' the relationship between television and learning achievement, perhaps we should turn to what could be.

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Table 1
Characteristics of Studies

State	Sampling	Grade Level	N	Dependent Measure
Rhode Island	Random Sample	4 8	2,785 3,985	Iowa Test of Basic Skills Vocabulary, comprehension, study skills
Texas	Random Sample	6	10,400	Objective-based test--44 reading items at grade 6
Pennsylvania	Matrix Sampling	5 8 11	32,000 34,000 37,000	Objective-based test, covering all major cognitive areas, as well as affective items. 200 items, 11 forms; 3 at grade 5, 4 at grade 8 4 at grade 11.
Connecticut	Random Sample	4 8 11	2,776 2,598 2,413	Objective-based test; 35 items, covering seven reading areas
Michigan	All students in grade levels	4 7 10	120,837 130,173 129,721	Objective-based test; 42 items including vocabulary, literal comprehension, interpretive reading, critical reading, and study skills.
California	Matrix Sampling	6 12	280,000 230,000	Objective-based test; 30 items, 8 reading items per test. 16 forms at grade 6, 18 forms at grade 12.
Maine	Random Sample Stratified Cluster Design	4 8 11	1,711 1,498 1,283	Objective-based test, 43 items across 9 subject areas
Illinois	Random Sample	4 8 11	2,500 2,381 2,261	Objective-based test of language arts and math, 7 vocabulary items, 18 comprehension items

Table 1 (cont.)

State	TV Question	SES Question	Year of Study	Time/year
Rhode Island	No. of hours of television watched per day	———	1981	fall
Texas	No. of hours watched the previous night	(Question asked but not transferred to data-tape	1978	spring
Pennsylvania	No. of hours watched from the time the child get home from school until bedtime	Parents occupation Parents education	1983	fall
Connecticut	No. of hours per day of TV viewed	No. of educational resources in the home	1979	4: Feb. 8: Oct. 11: April
Michigan	Yesterday, how much time was spent on TV viewing	Title I	1981-82	fall
California	Yesterday, how much time was spent on TV viewing--Grade 6 On a typical weekday how many hours viewed Grade 12	Parents Occupation	1980-81	6: April 12: Dec
Maine	On an average weekday how much time do you spend watching TV	———	1982-83	Dec.
Illinois	About how many hours a day do you watch TV	Parents Ed	1982-3	Fall

Table 2

Percentage of Students Watching TV

Elementary

Response Category	R.I.	Pa.	CT.	Mich.	Maine	Ill.
Less than 1 hour	10	10	7.4	29	15	7
1-Less than 2	18	17	19.4	27	23	12
2-Less than 4	42	40	40.9	18	34	34
4 or more	32	33	32.3	26	28	47

Intermediate

Response Category	R.I.	PA.	CT.	Mich.	Maine	Ill.	Texas	Calif.
Less than 1 hour	8	11	6.6	24	9	5	10	27
1 - Less than 2	22	19	23.8	30	23	14	32	23
2- Less than 4	45	43	51.8	24	44	49	33	28
4 or more	25	27	17.8	22	24	32	25	22

Table 1 (cont.)

State	Substantive Results of Assessment
Rhode Island	Fourth graders, watching two to three hours a day had higher achievement scores than others. Eighth graders, watching more than four hours a day showed a negative effect.
Texas	Students, reporting up to 2 hours of TV a day scored at the national average of above on all tests. Those watching more than 4 scored below national norms.
Pennsylvania	Substantial drop in achievement when students watched 5 or more hours of TV.
Connecticut	Students watching more than 4 hours of TV scored lower in reading than others watching a more moderate amount.
Michigan	Drop in achievement when substantial amount of TV was viewed.
California	Students watching a good deal of TV generally scored lower than those watching little or no TV.
Maine	Student who watched less TV (1-3 hours per day) did significantly better than those who watched more.
Illinois	Drop in achievement for those students who watched an excessive amount of television per day.

High School

Response Category	Pa.	CT.	Mich.	Maine	Ill.	Calif.
Less than 1 hour	29	23.6	34	18	9	30
1 - Less than 2	25	34.2	30	54	23	22
2 - Less than 4	33	36.3	23	14	50	32
4 or more	23	5.9	23	14	18	16

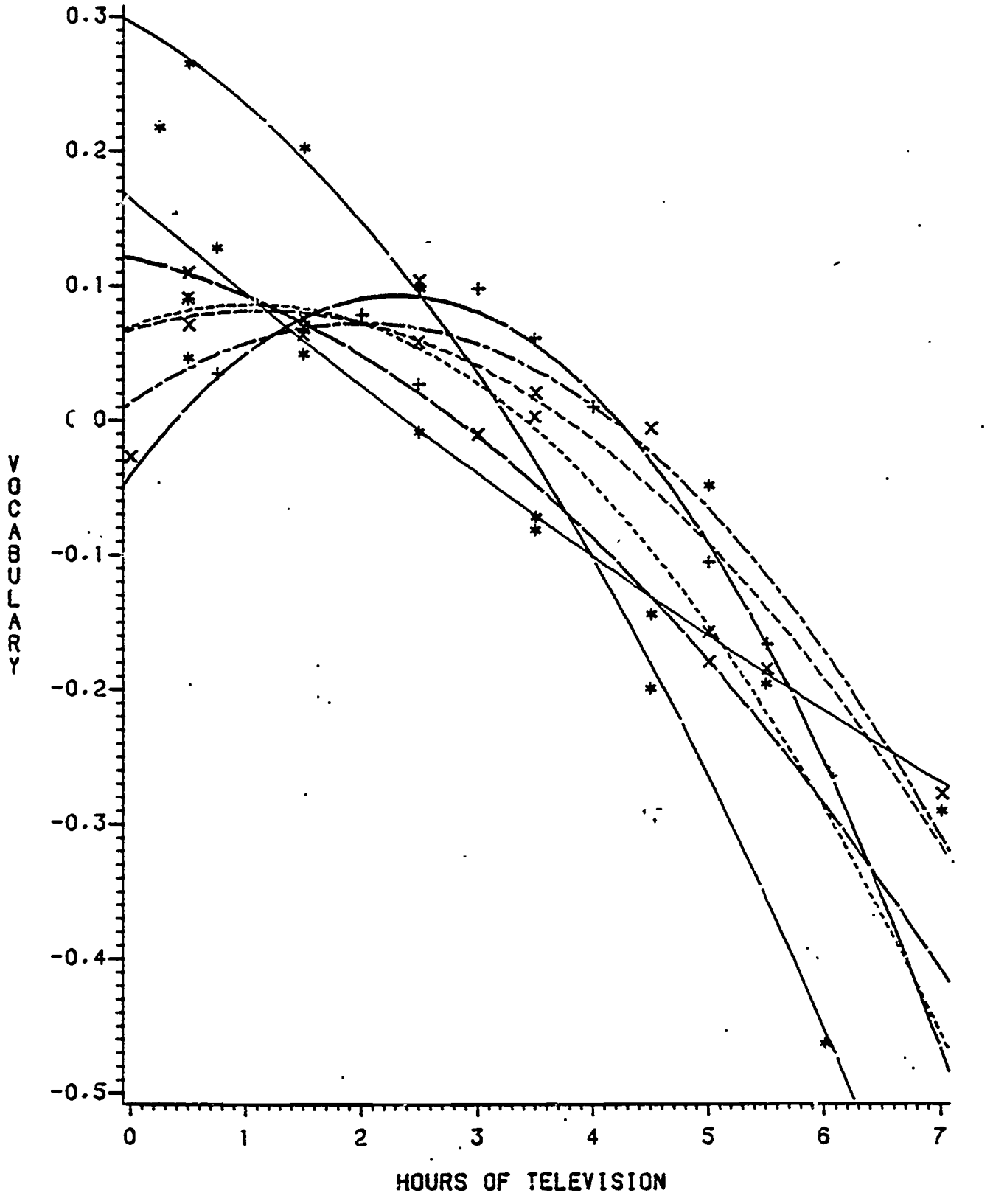
Table 3

Polynomial regression of achievement on Amount of viewing

rameter Estimate	Voc.	Comp.	St. Sk.
ementary			
Intercept	.02	.016	.03
Viewing	.08	.10	.05
Viewing Squared	-.02***	-.03***	-.02**
(Test for curvilinearity)			
rmediate			
Intercept	.04	.07	.001
Viewing	.04	.05	.05
Viewing squared	-.01***	-.02***	-.01***
gh School			
Intercept	.07	.14	.10
Viewing	.03	-.01	-.02
Viewing squared	-.02**	-.02**	-.01

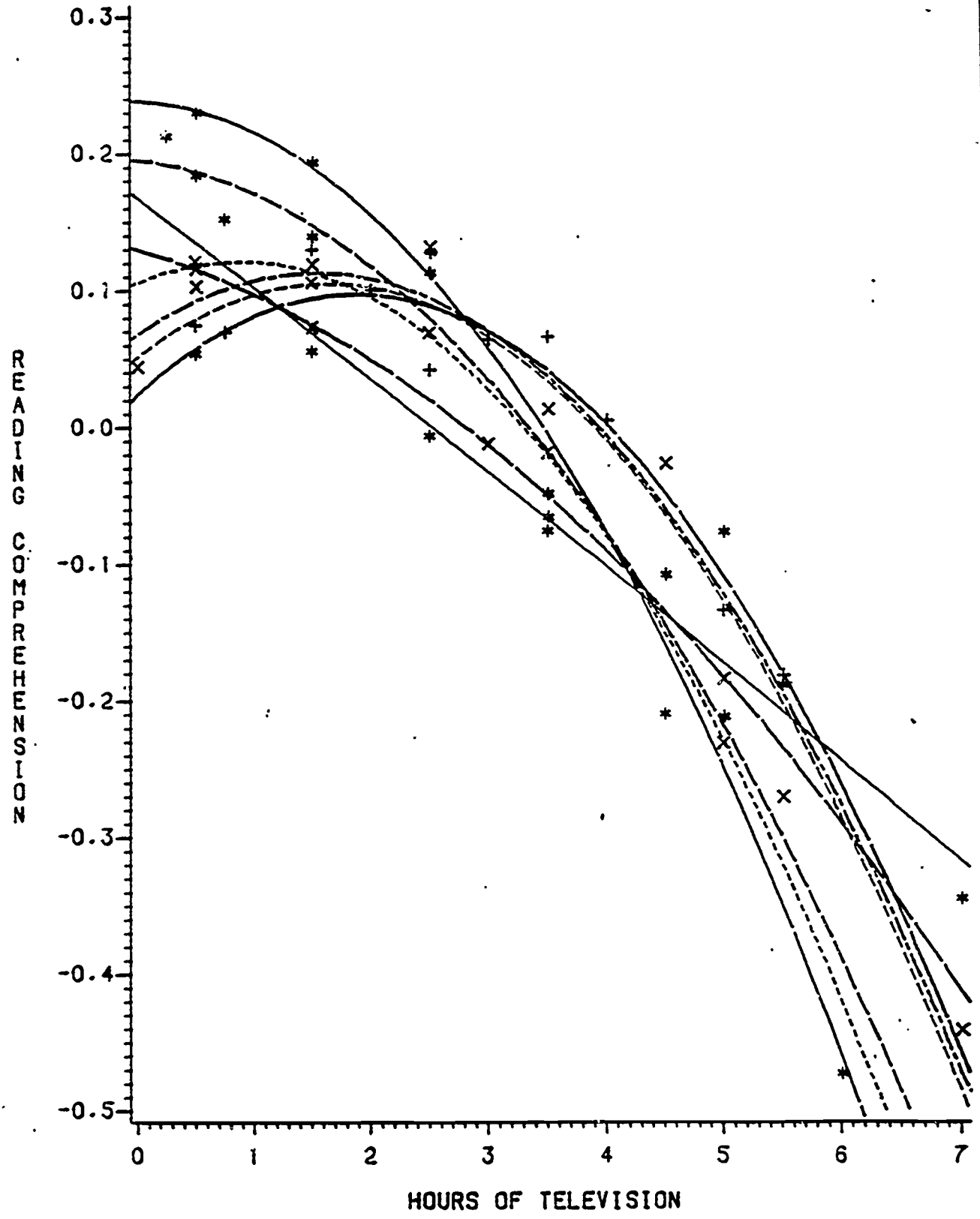
< .0001
< .01

OVERLAID PLOTS OF EIGHT STATES



SCORES WEIGHTED ACCORDING TO SAMPLE SIZE

OVERLAID PLOTS OF EIGHT STATES

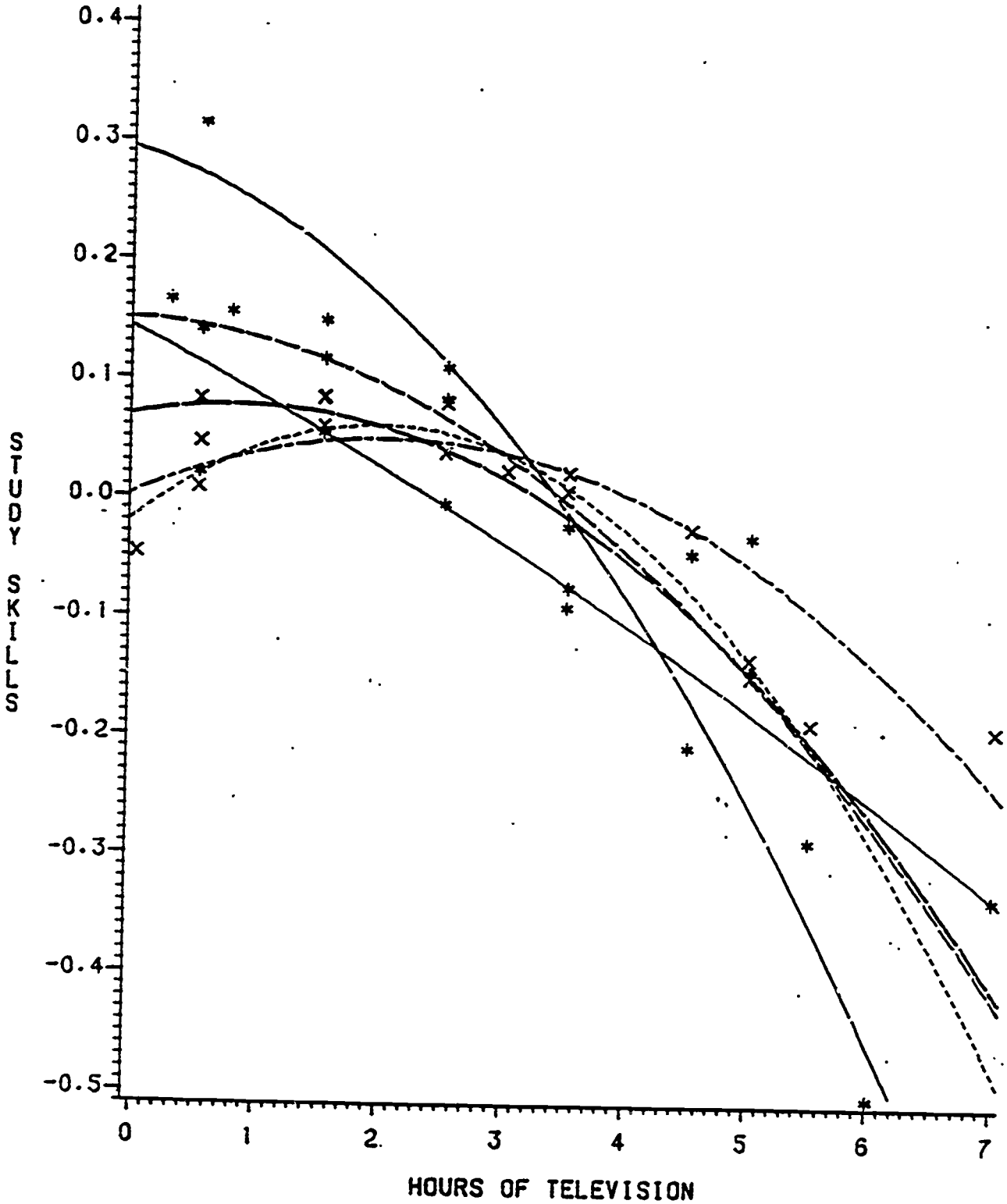


LEGEND: STATE

CALIFORN
MAINE
RHODE IS
CONNECTI
MICHIGAN
TEXAS
ILLINOI
PENNSYL

SCORES WEIGHTED ACCORDING TO SAMPLE SIZE

OVERLAID PLOTS OF EIGHT STATES

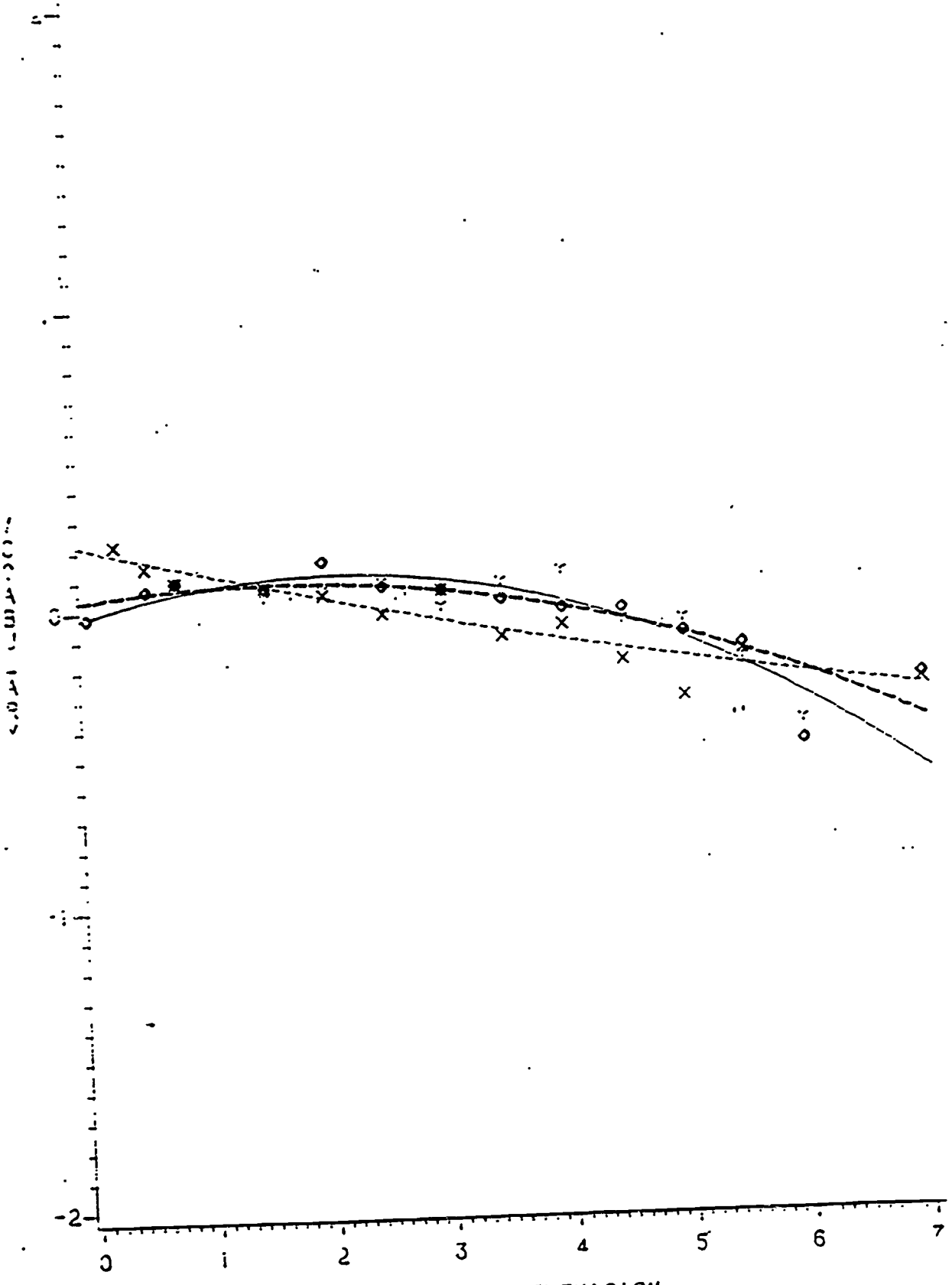


SCORES WEIGHTED ACCORDING TO SAMPLE SIZE

Table 4c

44

OVERLAID PLOTS FOR THREE LEVELS



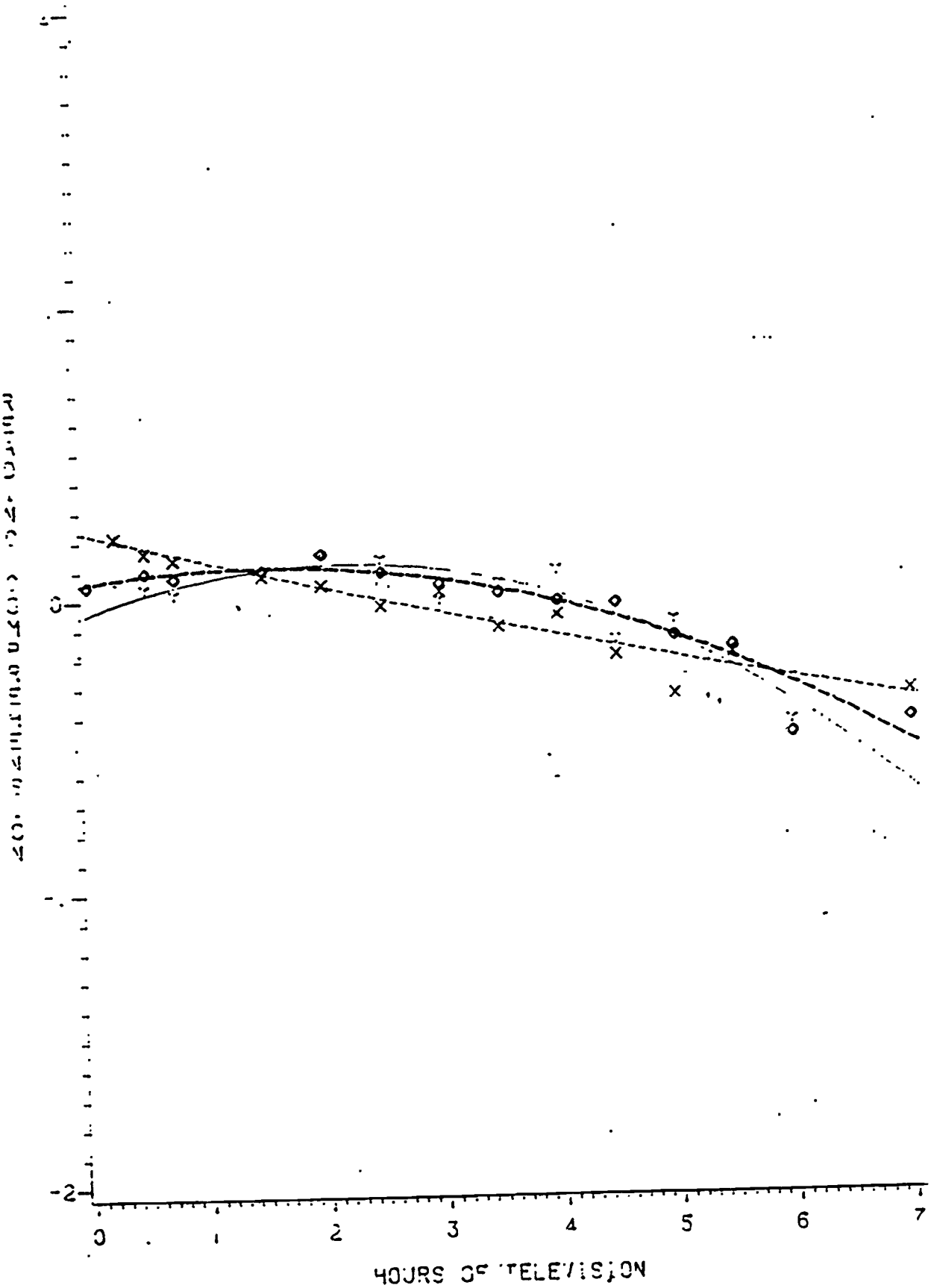
LEGEND: LEVEL ——— ELEMENTA *-*-* HIGH SCH ●-●-● INTERMED

QUADRATIC REGRESSIONS

STANDARD DEVIATION UNITS

SCORES WEIGHTED ACCORDING TO SAMPLE SIZE

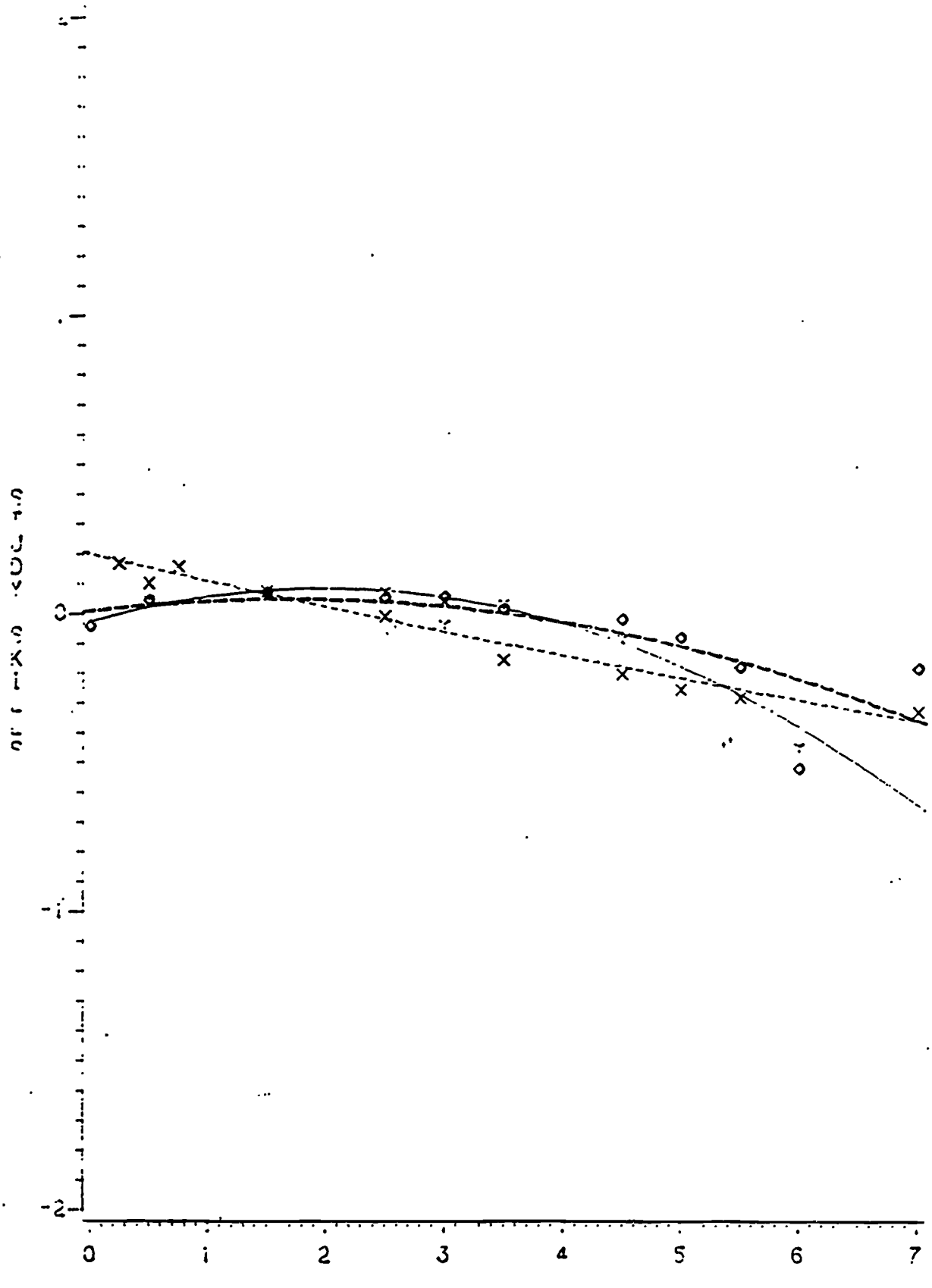
OVERLAID PLOTS FOR THREE LEVELS



LEGEND: LEVEL ELEMENTA x-x-x HIGH SCH INTERMED

QUADRATIC REGRESSIONS
STANDARD DEVIATION UNITS
SCORES WEIGHTED ACCORDING TO SAMPLE SIZE

OVERLAID PLOTS FOR THREE LEVELS



LEGEND: LEVEL ELEMENTA HIGH SCH INTERMED
QUADRATIC REGRESSIONS
STANDARD DEVIATION UNITS
SCORES WEIGHTED ACCORDING TO SAMPLE SIZE

Table 5c

Table 6

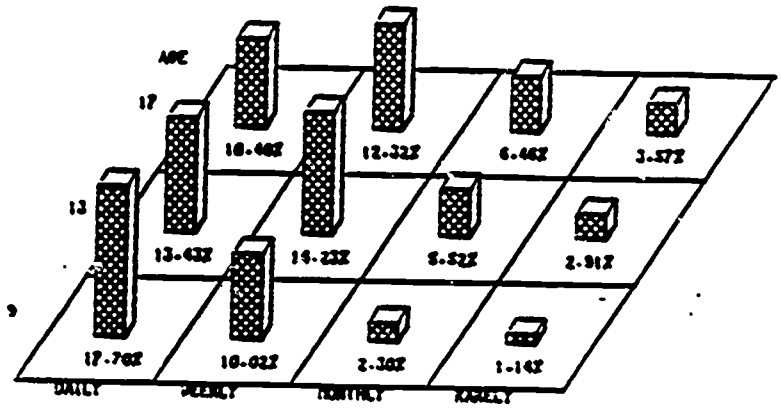
Out-of school leisure variables

Displacement Hypothesis	Variables analyzed
Functional similarity	Book reading Video games Newspaper reading Music
Physical and psychological proximity	Homework
Marginal fringe	Playing a sport Being with friends Snacking Shopping
Functional Reorganization	Changes in media activities over grade level

READING TIME

NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS 1983-84
TIME- THIRTEEN- AND SEVENTEEN-YEAR-OLDS

PERCENTAGE BLOCK CHART

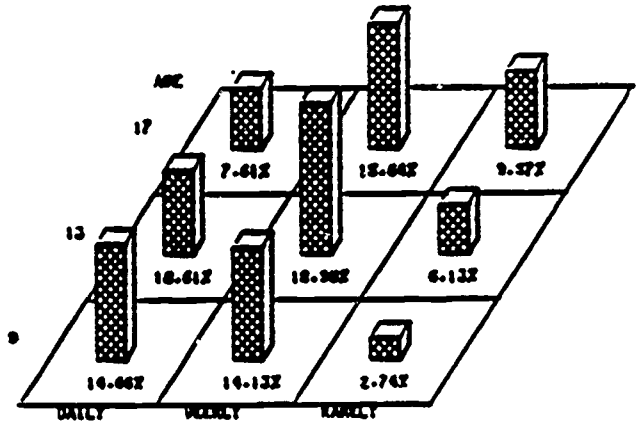


HOW OFTEN READS FOR FUN ON OWN TIME?

READING BOOKS

NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS 1983-84
TIME- THIRTEEN- AND SEVENTEEN-YEAR-OLDS

PERCENTAGE BLOCK CHART



WHEN FREE TIME, HOW OFTEN READ A BOOK?

RECREATIONAL READING AND TELEVISION TIME

NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS 1983-84
NINE- THIRTEEN- AND SEVENTEEN-YEAR-OLDS

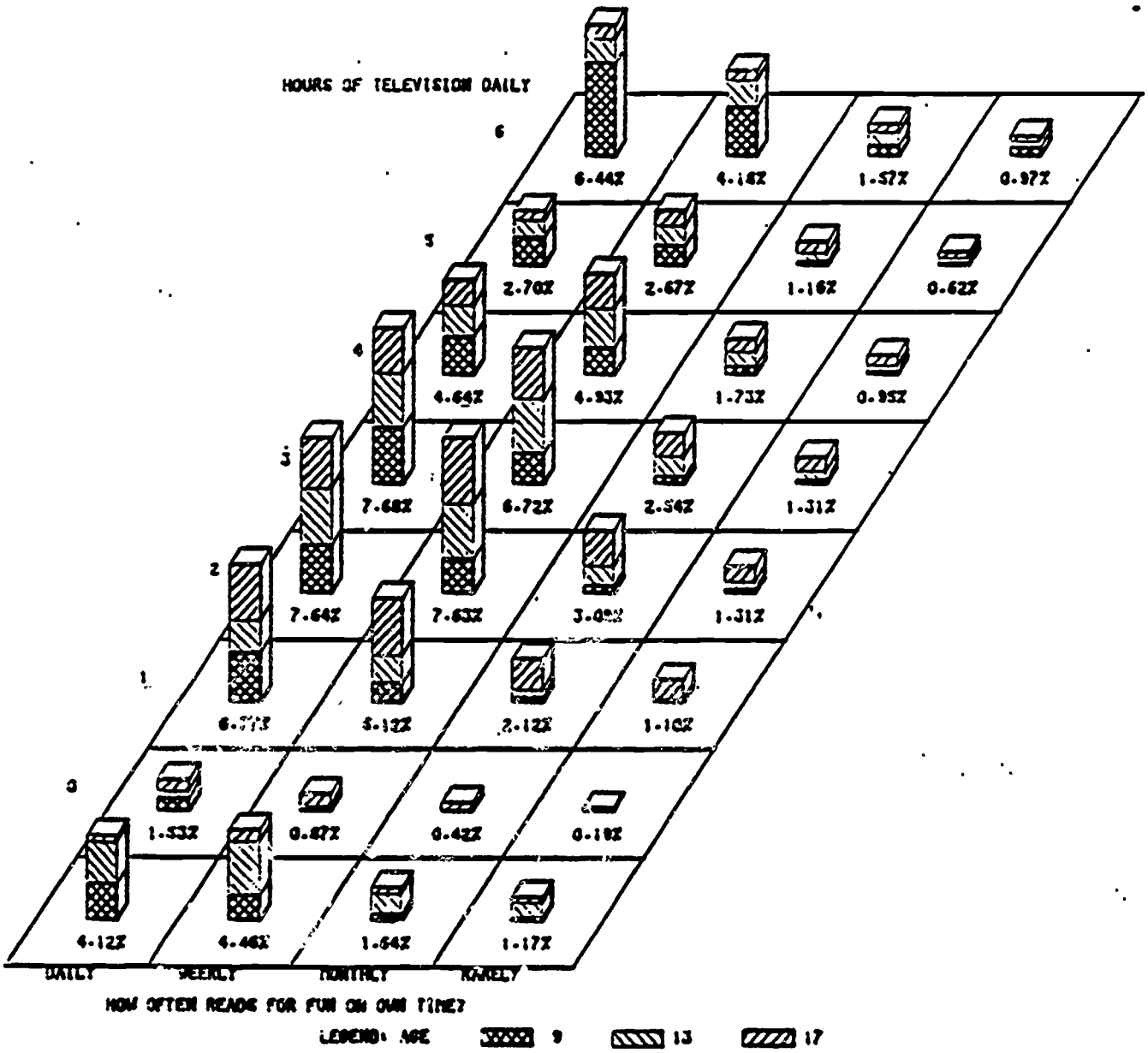


Table 9a

AVERAGE READING SCORES

BY READING TIME AND TELEVISION TIME
NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS 1983-84
NINE-YEAR-OLDS

BLOCK CHART OF MEANS

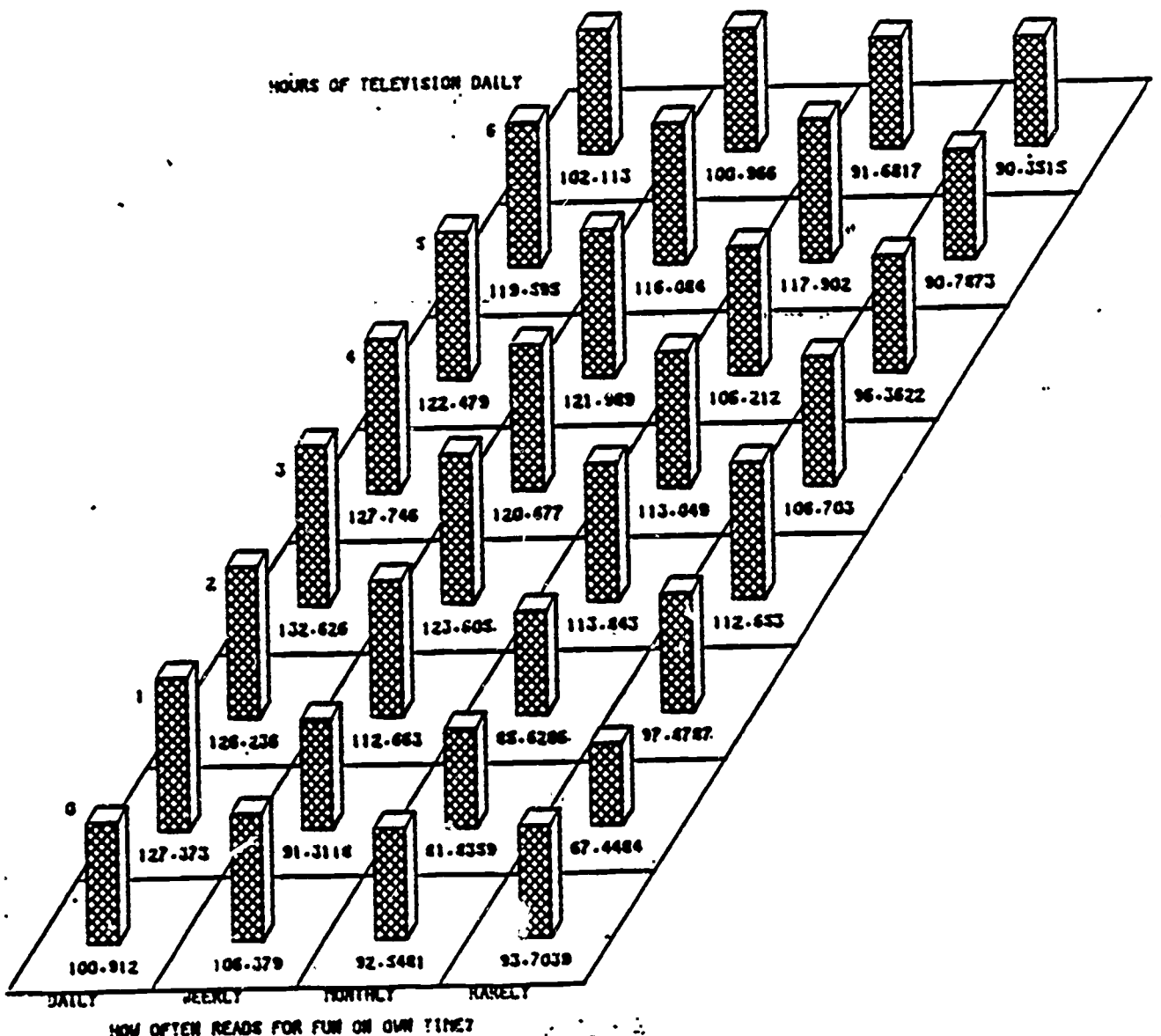


Table 9b

AVERAGE READING SCORES

BY READING TIME AND TELEVISION TIME
NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS 1983-84
THIRTEEN-YEAR-OLDS

BLOCK CHART OF MEANS

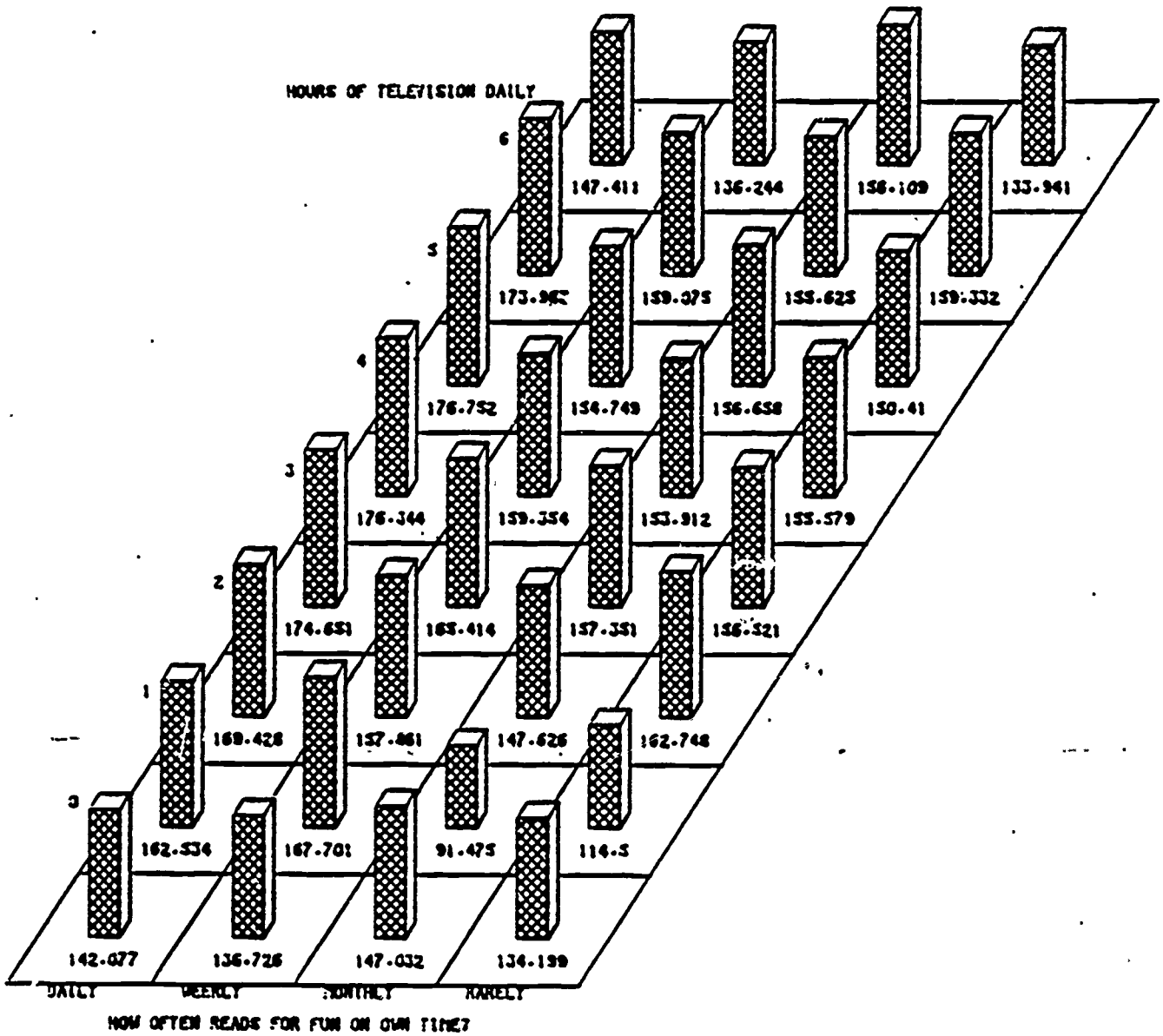


Table 9c

AVERAGE READING SCORES

BY READING TIME AND TELEVISION TIME
NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS 1983-84
SEVENTEEN-YEAR-OLDS

BLOCK CHART OF MEANS

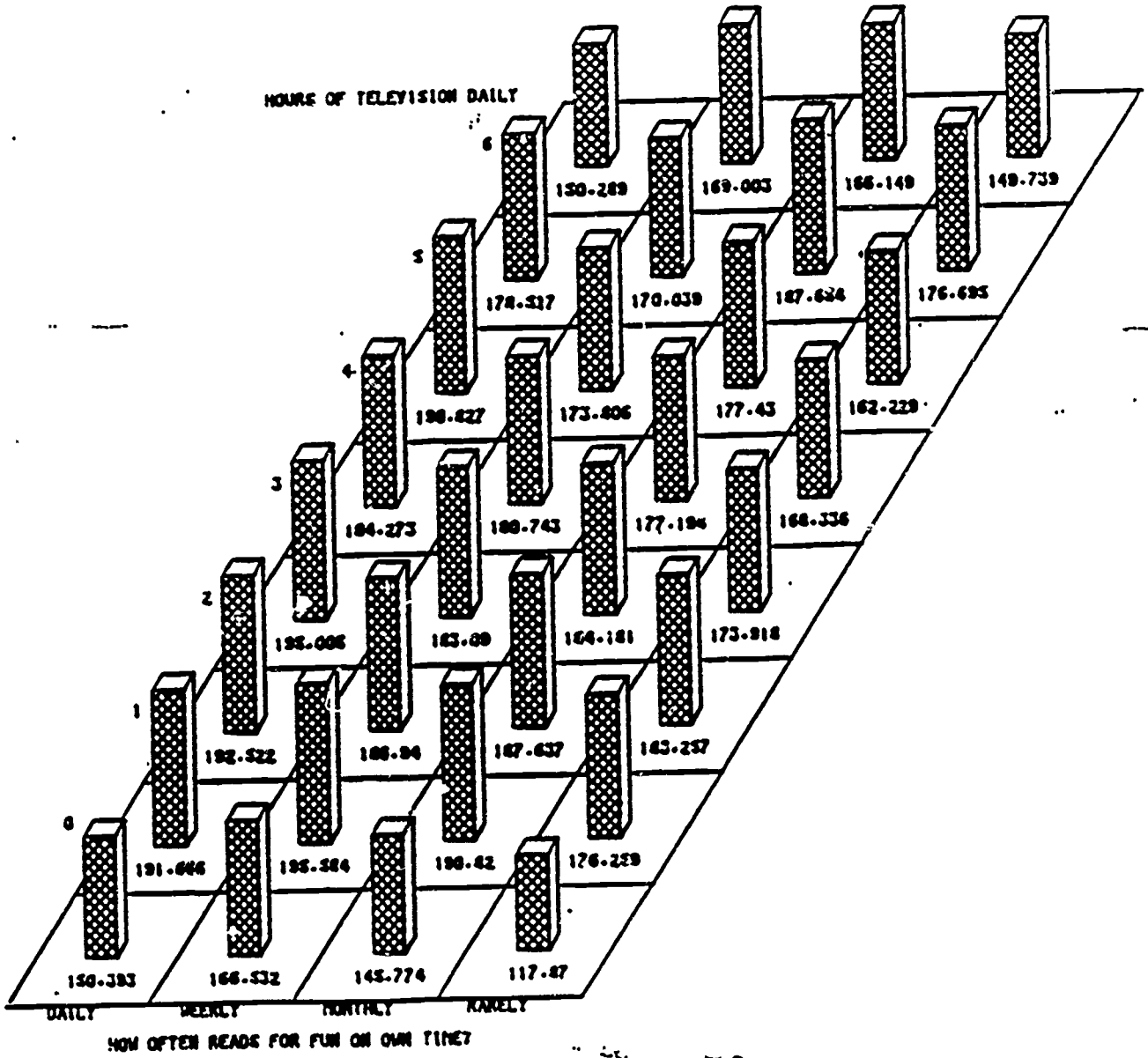


Table 10

Leisure reading variables with

time spent reading and viewing

Variable	Time spent reading	Time spent viewing
Reading importance	.02	.03
Kind of reader	.10	-.02
Spare time reading		
Read to do certain activities	.006	-.05
Read to play games	.02	-.007
Read for enjoyment	.34	-.07

Table 11

Time spent on Media Activities--NAEP '84

Media Activities	Hispanic	Black	White
9 year olds			
Watch TV	25%	30%	29%
Read a book	5%	9%	10%
Video Games	9%	9%	7%
Music	7%	6%	9%
Read a newspaper	1%	0%	1%
13 year olds			
Watch Tv	25%	33%	24%
Read a book	3%	7%	6%
Video Games	6%	5%	2%
Music	17%	11%	14%
Read a newspaper	2%	1%	1%
17 year olds			
Watch TV	15%	17%	12%
Read a Book	3%	9%	4%
Video Games	1%	0%	0%
Music	18%	16%	21%
Read a newspaper	2%	2%	1%

Table 12

Time spent on homework--NAEP '84

Homework Activities	Hispanic	Black	White
9 year olds			
No homework given	33%	31%	36%
Didn't do homework	5%	6%	4%
Less than 1 hour	43%	43%	42%
Between 1 and 2 hours	12%	12%	13%
More than 2 hours	9%	9%	5%
13 year olds			
No homework given	23%	22%	23%
Didn't do homework	8%	4%	4%
Less than 1 hour	32%	35%	36%
Between 1 and 2 hours	27%	28%	29%
More than 2 hours	11%	11%	8%
17 year olds			
No homework given	27%	24%	22%
Didn't do homework	13%	7%	11%
Less than 1 hour	24%	25%	27%
Between 1 and 2 hours	25%	31%	26%
More than 2 hours	12%	12%	13%

Table 13

Time spent on other leisure activities--NAEP '84

Leisure activities	Hispanic	Black	White
9 year olds			
Watching TV	25%	30%	29%
Call a friend	1%	3%	2%
Be with friends	8%	9%	13%
Sports	9%	8%	9%
Snacks	2%	1%	2%
Playing	5%	1%	1%
13 year olds			
Watching TV	25%	33%	24%
Call a friend	6%	8%	7%
Be with friends	11%	8%	14%
Sports	11%	12%	14%
Snacks	0%	1%	1%
17 year olds			
Watching TV	15%	17%	12%
Call a friend	9%	12%	7%
Be with friends	17%	13%	21%
Sports	17%	13%	12%
Snacks	1%	2%	1%