Research

Family Variables and Reading: A Study of Mothers of Poor and Average Readers in Japan, Taiwan, and the United States

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Mothers of poor and average readers in Japan, Taiwan and the United States were interviewed about their child-rearing practices, attitudes, and beliefs, and their children's current and earlier experiences. Poor readers represented the lowest fifth percentile in reading scores; they were matched by classroom, sex, and age with average readers; i.e., children who obtained reading scores within one standard deviation from the mean. The groups seldom differed significantly according to environmental variables and parent-child interactions. Maternal ratings of cognitive and achievement variables differentiated both the children in the two groups and the mothers themselves. Maternal beliefs and descriptions of how children use time also differed between the two groups. Notable was the absence of significant interactions between country and reading level.

Many hypotheses have been proposed to account for the occurrence of severe reading problems. In some hypotheses orthographic factors have been stressed; in others, neurological factors; and still others have emphasized the role played by environmental factors. It is to the last of these alternatives that the research reported in this paper is directed.

We might expect that large amounts of information about variables differentiating the families of poor and average readers have been published. This is not the case. As both Senf (1978) and Freund, Bradley, and Caldwell (1979) have pointed out, there is a surprising paucity of studies relating such variables to reading ability.

Our purpose in undertaking the present research is two-fold. We have sought to isolate factors in the home that separate poor and average readers and to compare these factors across three very diverse cultures. The study is necessarily empirical. The paucity of research and the inexplicitness of theories about reading disability made it impossible to derive specific hypotheses to be tested.

The data are from a large, cross-national study of reading ability among Chinese, Japanese, and American children (Stevenson, Stigler, Lucker, Lee, Hsu, & Kitamura 1982). Chinese and Japanese children were chosen because of their reputed lack of reading disabilities (e.g., Makita 1968). However, a previous report from this project (Stevenson, et al 1982) indicates that reading disabilities are found among Chinese and Japanese children. A comparison of the three cultures remains important, however, for factors which differentiate poor readers from average readers in all three cultures must have a rather basic and pervasive influence on the process of reading. At the same time, factors that differ among the three cultures in their relation to reading may give us greater insight into the backgrounds of children in each culture who are reading disabled.

METHOD

Subjects

The children were obtained from 20 fifth-grade classrooms in 10 elementary schools representative of schools in each of three locations: Sendai, Japan; Taipei, Taiwan; and the Minneapolis metropolitan area. Sendai and Minneapolis were chosen because of their comparability in size, general economic level, and cultural status within their countries. Each is an economically successful city with no heavy industry and a very small minority population. Taipei was chosen because it is a city with a Chinese-speaking population and is comparable in size to the other two cities.

All children in each classroom were given a reading test constructed for this research. The test yields scores for sight reading of vocabulary, reading of meaningful materials, and comprehension. Details of its construction and content appear in Stevenson et al. (1982). A total of 932 children in Taipei, 770 children in Sendai, and 453 children in Minneapolis were tested. Mentally retarded children were eliminated from the samples on the basis of their test scores on the Raven's Progressive Matrices Test, reports from school psychologists, and confirmation by the teachers. (For further discussion of the constitution of these groups see Stevenson et al., 1982).

A composite reading score was computed for each child and a distribution of scores was determined for each country. The cutoff score for the lowest fifth percentile of the children was found for the distributions of scores from each country. On the average these fifth-grade children were reading at somewhat below the third grade level. A special effort was made to interview the mother of each child whose score fell below this cutoff point.

The final sample of poor readers included 35 children in Taipei, 26 children in Sendai, and 19 children in Minneapolis. The numbers depart from 5% of each total group because some parents did not wish to participate in the parent interview. The mothers did not differ from the remaining mothers in terms of their children's reading scores $Fs < .99$. The ratio of boys to girls in the three countries was 20/15 (Taipei), 16/10 (Sendai),

and 8/11 (Minneapolis). In no case were there sex differences in the reading scores obtained by the poor readers, Fs < 2.12, $p > .10$. It does not appear, therefore, that among the poor readers, boys and girls represented different levels of reading ability.

Within each country, each of the poor readers was matched with a child from the same classroom, of the same sex, the same age, and whose reading score fell within one standard deviation from the mean. These children are referred to as average readers. Mean scores for the three parts of the reading test for the poor and average readers appear in Table 1. Significant differences between poor and average readers were observed for each of the three reading scores, Fs > 42.82, $p < .001$. The interactions with country were not significant, and only for sight reading vocabulary was there a significant main effect of country, $F(2, 167) = 7.22$, $p < .001$.

Table 1. Means and Standard Deviations for the Reading and Mathematics Scores of Children in the Low and Average Reading Groups

Score	Country					
	Japan		Taiwan		USA	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
Poor readers						
Vocabulary (raw score)	27.6	9.4	34.0	11.5	32.9	8.0
Comprehension (raw score)	61.7	9.5	62.1	12.5	62.4	13.2
Reading text (proportion)	.73	.08	.69	.17	.68	.14
Mathematics (proportion)	.54	.13	.53	.15	.49	.10
Average readers						
Vocabulary (raw score)	44.5	2.7	48.2	1.1	46.2	4.2
Comprehension (raw score)	82.6	5.0	86.0	1.0	84.5	4.0
Reading text (proportion)	.81	.09	.79	.03	.81	.07
Mathematics (proportion)	.73	.06	.67	.05	.59	.04

Parent Interview

A parent of each child was interviewed in a structured interview that lasted from 1 to 1½ hours. Most interviews were with mothers (100% in Japan, 93.1% in Taiwan, and 97.4% in the United States). If an interview with the mother could not be arranged, an interview was held with the father, grandmother, or other primary caretaker of the child. Parents knew that a study of children's achievement was being conducted in their child's school, but had no way of seeing the interview as something unusual, since several hundred mothers were interviewed in the major study of which this is a part.

We sought to insure comparability across the three cultures by constructing an interview consisting primarily of objective, forced-choice questions. Because of possible differences in loquacity, willingness to verbalize about certain topics, or other possible cultural differences, alternative answers were supplied within the interview whenever possible. However, in order to guard against missing important information that might not emerge from the objective responses, some open-ended, subjectively-coded questions were also included.

Questions were developed and refined by a group of researchers from Japan, Taiwan, and the United States. The first step was to interview American mothers, and mothers from Japan and Taiwan who had recently arrived in the United States. Based on the results of these open-ended, exploratory interviews, which were conducted in Japanese, Chinese, and English, the research team developed a final set of questions that was acceptable to representatives from each country.

The interview was wide ranging. We attempted to include many domains of experience that might be related to the academic performance of children in elementary schools of the three countries. The questions can be divided into eight categories: demographic characteristics of the family, parent activities, mother's beliefs about child rearing, mother's attitudes toward school and learning, parent-child relations, mother's ratings of child's academic, cognitive, and personality characteristics, and of self, child's routines, child's preschool experiences.

The interview was conducted by local residents who were carefully trained in the interview procedures. All interviews were coded at the University of Michigan by student research assistants from the three countries.

Results

Responses to the parent interview were analyzed primarily by means of 2 (level of reading ability) by 3 (country) by 2 (sex) analyses of variance. Our interest in this study is in family characteristics associated with level of reading ability; thus our attention will be directed to significant differences in parental responses associated with reading level as well as to interactions of reading level with sex and country. Very few significant interactions were obtained, and to avoid repetition these interaction terms will be noted only when they are significant. Many significant main effects for country were found; these will be discussed only when the variables interact significantly with level of reading skill. Very few sex differences appeared.

Parental awareness. Only half (50%) of the parents of poor readers indicated that their child "had any problems in reading". This percentage is significantly greater, however, than that (23%) for parents of average readers, F (1, 141) = 13.41, $p < .001$. Large differences in parental awareness were found across the three countries, F (2, 141) = 6.34, $p < .01$. The percentage of mothers of poor readers who reported their child had a reading problem was 84% in the United States, but only 42% in Japan and 34% in Taiwan. These findings are in line with the reports (e.g., Makita 1968), that reading difficulties among children are not as likely to be considered problems by the Asian parent or teacher as by the American.

Awareness of reading problems is also indicated by the mothers' ratings of their children's academic performance. Ratings were made on a scale which ranged from

1 (much below average) to 9 (much above average). As is evident in Figure 1, large and significant differences appeared between the ratings made by mothers of poor and average readers. Even so, mothers generally gave their children ratings above those suggested by their performance. Although the poor readers' scores on the reading test were in the lowest fifth percentile, the average rating made by their mothers was only slightly below that labeled as average (5.0). Differences were also found in the maternal ratings of poor and average readers for mathematics and general academic performance. (Mathematics test scores for the two groups differed significantly, F (1, 141) = 90.34, $p < .001$.) When asked how well their child potentially could do in school, mothers of both poor and average readers rated their children above average; however, the difference in ratings of poor and average readers was still significant. There were no significant interactions between reading group and country or sex for any of these ratings, thus, the differences in ratings made by the mothers of poor and average readers were of comparable magnitude in all three countries.

When parents were asked to predict how far their child would go in school, significant differences also emerged, F (1, 143) = 26.78, $p < .001$. Parents of poor readers expected their children would attend school between 12 and 13 years, while parents of average readers expected their children would complete more than 14 years of schooling. (Degrees of freedom differ slightly among the various analyses reported since the analyses were conducted only on data where a definite answer was given. Mothers who failed to respond are not included.)

Family variables. Data were available concerning the occupation of the fathers and the educational level of mothers and fathers. In Minneapolis no significant differences were found between parents of poor and average readers for these three variables.

Only in Sendai did occupation of the fathers differ significantly between the two groups, $X^2(2) = 6.00$, $p < .05$. Even so, the educational attainment of neither the fathers nor the mothers in Sendai differed according to their children's reading ability. This was in sharp contrast to the pattern in Taipei, where both fathers and mothers of average readers had an average of three to four more years of formal schooling than parents of poor readers.

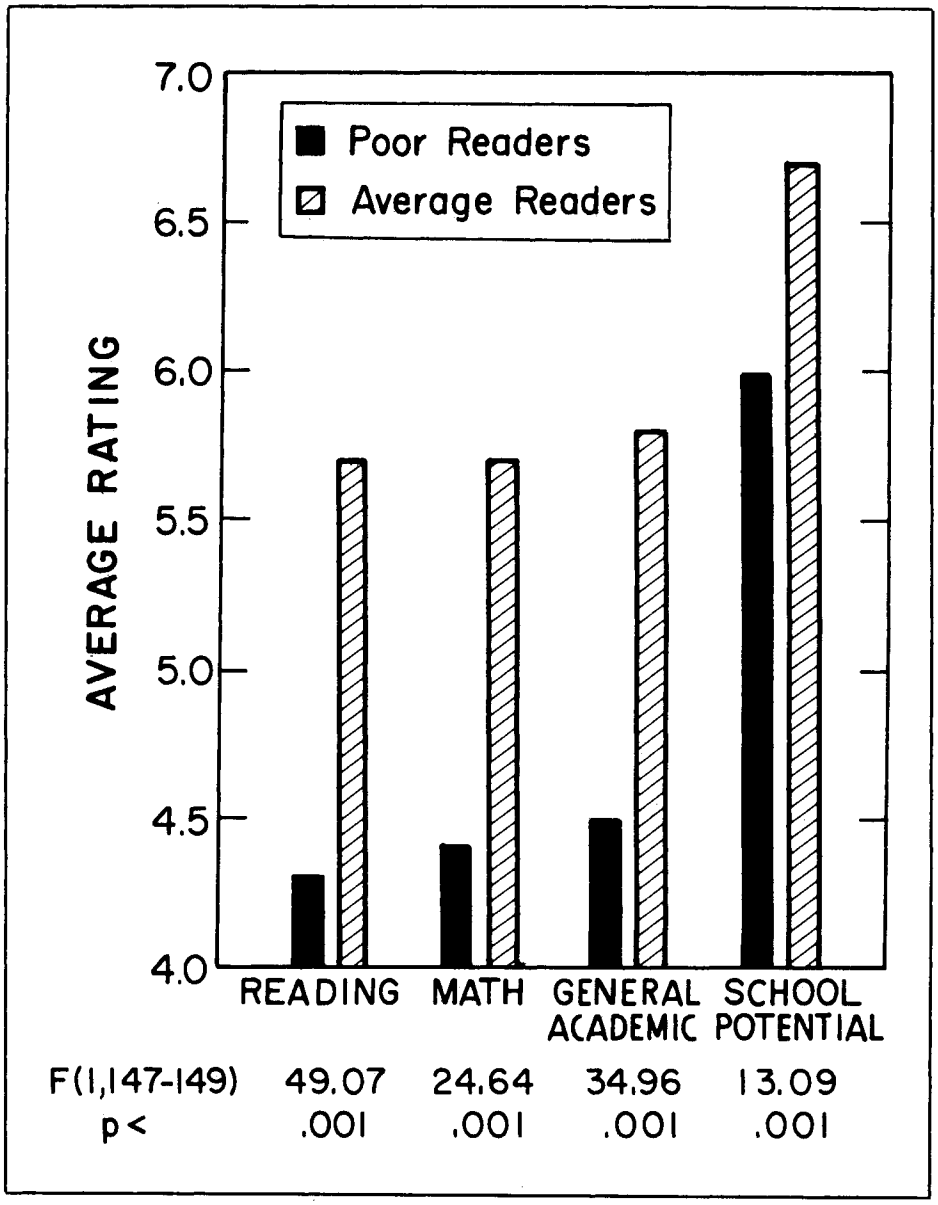

Figure 1. Mothers' ratings of their children's academic performance and potential for academic achievement.

Birth order also differed significantly between poor and average readers, F (1, 149) = 7.64, $p < .01$. The poor readers tended to be later-born children. The mean birth orders were 2.63 and 2.05, respectively.

Family variables not associated with significant differences between poor and average readers included working status of the mother, occurrence of divorce, and type and extensiveness of preschool child care.

Ratings of children. Each mother was asked to compare her child with other children of the same age on a number of cognitive skills. The scale ranged from 1 (much below average) to 9 (much above average). The results appear in Figure 2. Differences between ratings made by mothers of poor and average readers are significant and consistent across all three countries for memory ("remembering things"), learning ("learning new things"), verbal expressiveness, intellectual ability, and scholastic motivation ("motivation to do well in school"). On neither attentiveness nor use of time ("ability to use time effectively") were the differences significant. Poor and average readers were evaluated differently, therefore, by mothers

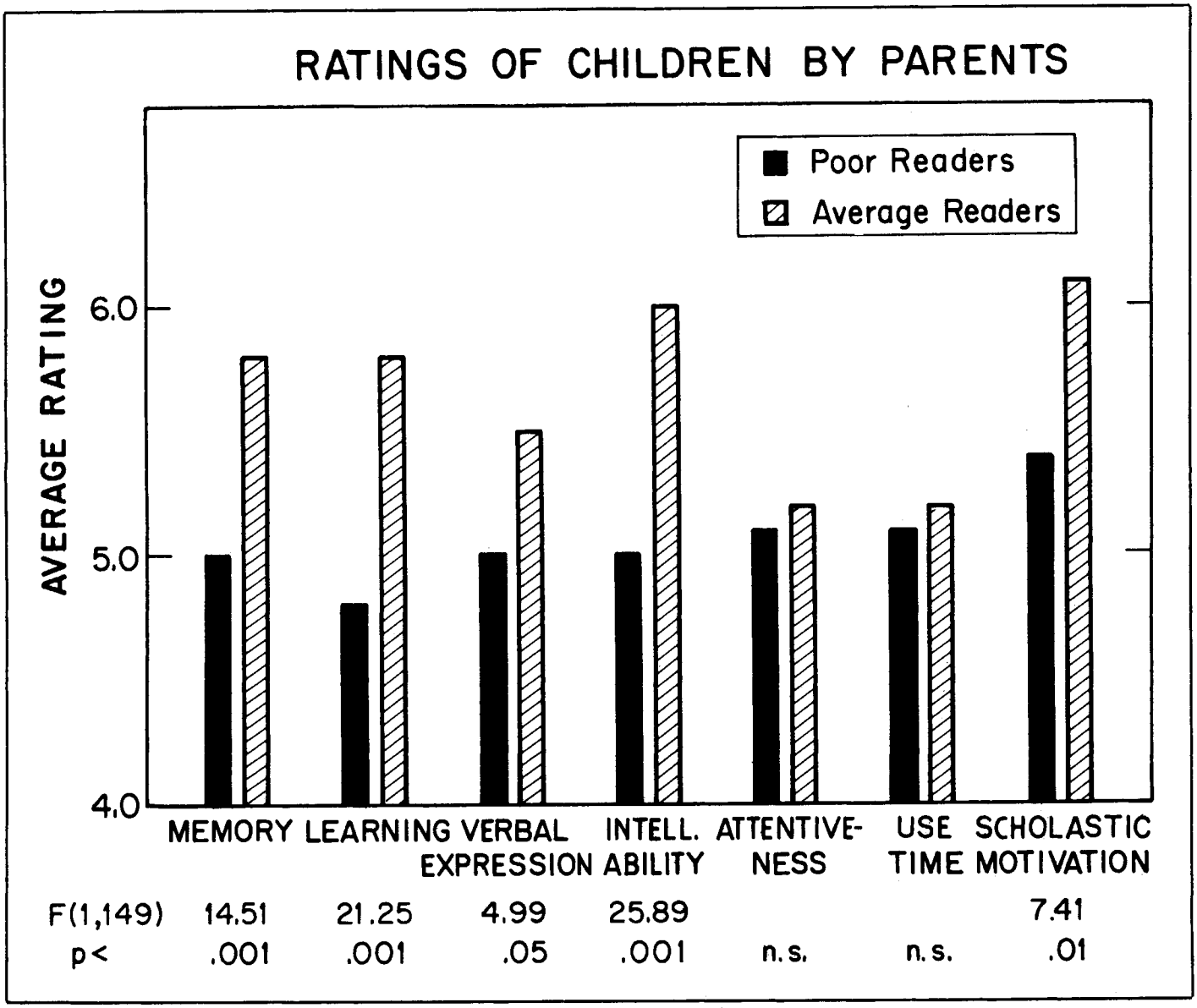

Figure 2. Average ratings made by mothers of children's cognitive abilities.

in all three countries.

A very different picture is obtained when variables of a less cognitive nature are considered. Later in the interview the mothers were asked to rate the child on 11 other variables, including such characteristics as persistent, anxious, curious, approval-seeking, obedient, restless, sociable, self-confident, shy, creative, and communicative. Only on the variables related to self-confidence, F (1, 144) = 6.34, $p < .05$, and creativity, F (1, 147) = 10.45, $p < .01$, did mothers of the average readers give their children significantly higher ratings than did the mothers of poor readers. The scale in these ratings varied from 1 (almost never like that) to 5 (almost always like that).

Among both sets of ratings a significant interaction between reading group and country was found only for verbal expressiveness, F (2, 149) = 3.46, $p < .05$. The average difference was greater in Minneapolis than in Taipei or Sendai.

Ratings of Self. The mothers were asked to think of the time they were in elementary school and to rate themselves on nine variables, comparing themselves at that time with other children in their grade. The variables were the same as those used in rating their own children earlier in the interview, except that "reasoning" was substituted for "intellectual ability" and "ability to use time effectively" was omitted. Mothers of poor readers gave themselves lower ratings than parents of average readers on reading, mathematics, memory, reasoning ability, and on a composite score for all of the cognitive variables (see Figure 3). The tendency of mothers of poor readers to give themselves lower ratings occurred with equal strength in all three countries.

Child Behaviors. Four types of behavior that differentiated poor and average readers were reported: amounts of time spent in reading for pleasure, homework, and play; and reading newspapers. Moth-

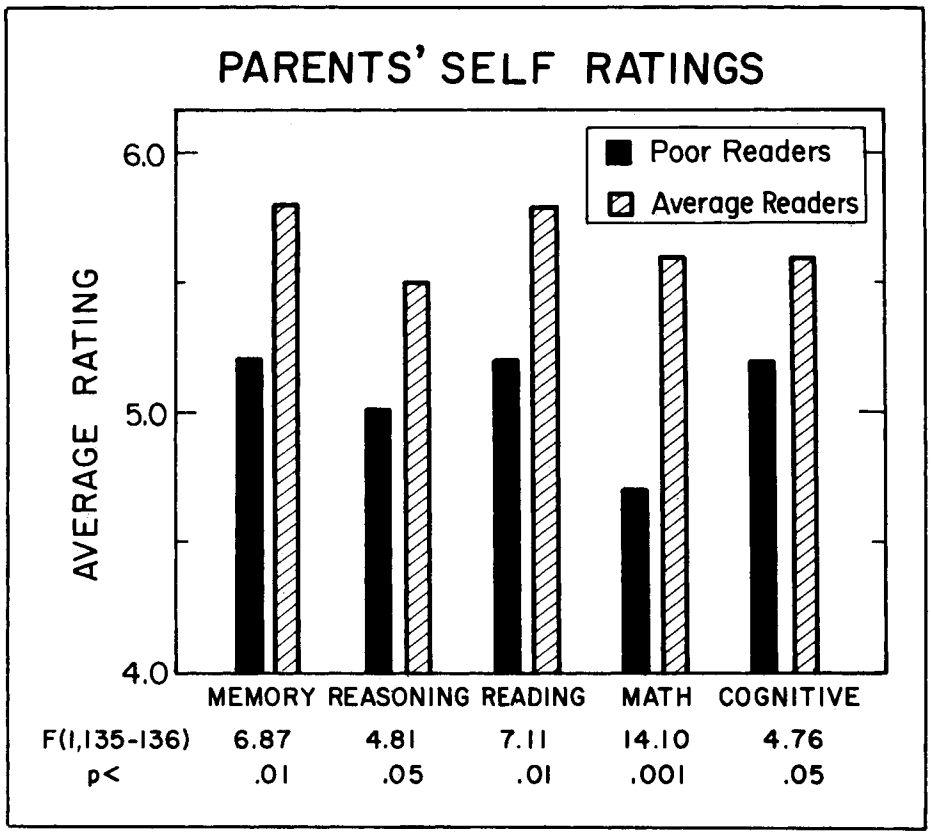

Figure 3. Average ratings of mothers' own cognitive and academic abilities.

ers estimated that poor readers spent an average of 3.5 hours per week reading for pleasure; average readers were estimated to spend 4.9 hours, F (1, 131) = 5.63, $p < .05$. Even though the overall averages differed greatly among the three countries (United States = 2.9 hours, Japan = 5.4 hours, and Taiwan = 4.1 hours), the difference between the estimates for poor and average readers was comparable in the three countries.

The percentages of poor and average readers who were reported to read newspapers differed greatly (26% versus 51%), and there was a significant interaction with country, F (2, 148) = 5.19, $p < .01$. Similar percentages were reported for the three groups of poor readers, 26% for Minneapolis, 24% for Taipei, and 27% for Sendai, but percentages for average readers varied greatly, 21% for Minneapolis, 73% for Taipei, and 42% for Sendai. Reading newspapers apparently is neither common among these groups of fifth graders in the United States, nor does it differentiate poor and average readers.

The amount of time mothers estimated that their children spent in doing homework differed significantly between poor and average readers, F (1, 144) = 6.58, $p < .05$. Poor readers were estimated to spend 6.4 hours per week and average readers, 8.0 hours. Estimates by mothers in the three countries differed significantly, F (2, 144) = 48.10, $p < .001$. The average reported by the Minneapolis mothers was 3.8 hours per week; in Taipei, 10.8 hours; and in Sendai, 5.1 hours. (Estimates were made for Saturday, Sunday, and a weekday. The values are composite scores obtained by multiplying the weekday estimate by five and summing across the three estimates.)

Estimates of time spent viewing television did not differ according to reading level, $F < 1.00$.

Child Problems. Mothers were asked, "Suppose _____ gets up one morning and says, 'I won't go to school today!' You know _____ is not sick. Has this ever happened?" Analysis showed a significant interaction between country and reading level, F (2, 148) = 5.27, $p < .01$. Both American and Japanese mothers of poor readers reported that this had occurred more frequently than did mothers of average readers. For American mothers the percentages were 63% and 42%, and for Japanese mothers, 58% and 19%. Comparable differences were not obtained between poor (9%) and average (19%) readers in Taiwan.

No significant effects were found between families of poor and average readers for types of discipline used by parents, or for the sex of the parent who helps the child in schoolwork, plays games with the child, talks over problems with the child, or disciplines the child.

Parents' Reading. Mothers were asked to estimate the amounts of time they and their husbands spent reading. Differences between mothers of poor and average readers were not significant. Estimates of the amount of time the fathers spent reading was a significant variable. In all countries fathers of average readers were estimated to spend more time reading than were fathers of poor readers, F (1, 131) = 9.76, $p < .01$. The average for the former was 7.8 hours a week, and for the latter, 4.2 hours.

Parent attitudes. "Children are helped in their schoolwork by their mothers, fathers, and teachers. How much do you think each one contributes to your child's success in school?" Mothers were asked to rank these three sources of help and then to assign points according to their importance, with the condition that the total number of points should equal 10. There was no significant difference in the points assigned to the fathers of poor and average readers, 1.7 versus 1.9 points. Mothers of poor readers assigned mothers a less important role than did mothers of average readers, 1.8 versus 2.1 points, F (1, 144) = 4.41, $p < .05$. At the same time, mothers of poor readers assigned significantly more points to the teacher (6.6) than did mothers of average readers (6.0), F (1, 145) = 4.88, $p < .05$. Thus, although both groups of mothers saw the teacher as being most important for their child's academic success, mothers of poor readers gave relatively greater emphasis to the teacher than to themselves.

Mothers also were asked to rank the importance of difficulty of school work, effort, ability, and chance as factors contributing to their child's academic success. The only variable for which a significant difference between responses of the mothers of poor and average readers

appeared was for the average rank assigned to ability. Mothers gave somewhat greater weight to ability if their children were poor readers than if they were average readers in both America (1.7 versus 1.8) and Taiwan (1.9 versus 2.2). In Japan the trend was reversed. For poor readers, the average rank was 2.4 and for average readers, 2.0. The interaction term is significant, F (2, 148) = 5.51, $p < .01$.

Other Variables. None of the other items of the interview yielded significant differences between poor and average readers or significant interactions with country or sex. This is not because the items were insensitive; large and highly significant differences were found between countries on a large proportion of these items. Beliefs about child rearing, attitudes toward the school, approaches to helping their children do well in school, and expectations about the age at which various activities should be undertaken alone by the child; the responses of the mothers of poor and average readers were not differentiated on any of these items.

DISCUSSION

Perhaps the most remarkable result of the study was the consistency of the differences (and lack of differences) revealed by the responses of the mothers of poor and average readers in the three cultures. By the fifth grade, Chinese children must learn thousands of characters and their combinations. Japanese children must master two syllabaries and learn hundreds of characters. American children must learn to read words composed of combinations of parts of an alphabet. Yet, the mothers' reports of characteristics that differentiated groups of poor and average readers of the three writing systems are remarkably similar.

The factors that emerged from the mothers' reports fell into two general categories, those related to the children's environments and those involving the abilities and activities of the children themselves. The former category is impressive in its paucity of significant effects, and the latter, in the clarity and frequency with which significant effects appeared.

Families of poor and average readers generally did not differ on demographic variables. This was surprising, but no more so than the few significant effects found for variables related to child rearing practices and parental expectations and beliefs. Mothers in the three countries gave markedly different responses to the questions related to these variables, but mothers of poor and average readers seldom differed in their responses.

Despite the lack of demographic differences between the two groups of families, mothers of poor readers tended to give both themselves and their children lower ratings on academic achievement and cognitive abilities than did mothers of average readers. Ratings of noncognitive variables produced few significant differences between poor and average readers. Even so, the mothers' ratings did not reflect the severity of the children's difficulties. For example, despite the fact that 95% of the children tested in each country received reading scores higher than those obtained by poor readers, mothers of poor readers rated their children as being only slightly below average. The discrepancy with performance was even more exaggerated in ratings of their children's academic potential, where the poor readers were rated as being above average. These discrepancies occurred in the United States, where the majority of the mothers of poor readers acknowledged that their children had a reading problem, and in Japan and Taiwan, where fewer mothers described their children in this way. Despite this obvious discrepancy between their evaluation of their child's potential and the child's actual performance, and despite the American mothers' acknowledgement that their child had a reading problem, American mothers of poor readers were no more likely than mothers of average readers to initiate activities that might help improve their children's academic performance. It is hard to understand why this should be the case. Mothers of poor readers, more than mothers of average readers, gave teachers relatively more importance than themselves in determining their children's success in school. This tendency may be related, in turn, to their perceptions of themselves as being less capable in cognitive and academic domains than were those of the mothers of average readers. These factors may have reduced their confidence that they would be able to do something to improve their children's performance. At any rate, mothers of poor readers may hinder their children's progress by having exaggerated notions of their children's abilities, by underestimating their own possible influence, and by failing to assist their children in improving their reading abilities.

The greater tendency of American mothers to describe their children as having a reading problem was not due to the children's actually performing more poorly than the poor readers in the other countries. Nor was it due to difficulties in providing comparable questions in the three languages. Although there is no word in Chinese or Japanese that is equivalent to the term "reading disability," it is not difficult to ask mothers about reading "problems". Marked cultural differences exist, therefore, in the willingness of parents to consider poor reading performance as constituting a problem. In Asian countries poor performance is likely to be considered a result of not trying hard enough or of not being taught effectively; in the West it is more likely to result in the child's being categorized as having a problem.

A final characteristic of poor readers in all three countries was their description as being infrequent readers. They were reported to read less often for pleasure, to spend less time doing homework, and in Japan and Taiwan, to be less likely to read newspapers. They came from families where the fathers were less likely to read for pleasure. In Japan and the United States they wanted to stay home from school more often than did the average readers. Thus, being over two years behind their peers in reading ability was accompanied by behavior that increased the likelihood that poor readers would fall even farther behind in their reading achievement.

In summary, the major characteristics described by the mothers of poor and average readers were ones related to cognitive skills. Seldom were environmental variables or parent-child interactions the ones which differed significantly between the responses of mothers of poor and average readers. Although such factors may appear as significant variables if different questions were asked, it would

seem more productive to pursue the investigation of the form and organization of cognitive activities of poor readers and their parents.

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