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ABSTRACT

Thirty-four third and fourth grade students were observed over two entire school days to examine the nature of instruction and academic responding time for LD and non-LD students in regular classrooms. Across students, a typical school day was characterized by a limited amount of academic responding (about 45 minutes). Comparison of LD and non-LD students revealed that, while there were no differences in time allocated to instruction, there were differences in the type of instruction received, with LD students receiving more individual instruction and more teacher approval than non-LD students. LD students were engaged in five of seven academic responses for greater amounts of time than non-LD students, while non-LD students were engaged in one academic response for a greater amount of time than LD students. However, there were no differences in the total academic responding times of the two groups of students. Findings related to variability among students and relationships between responding times and achievement also are presented. The implications of the findings for instruction and for special education decision making are discussed. The "Code for Instructional Structure and Student Academic Response" observation system is appended. (Author/DB)

University of Minnesota

Research Report No. 72

ACADEMIC RESPONDING TIME FOR LD AND NON-LD STUDENTS

Martha L. Thurlow, Janet Graden, Jean W. Greener,
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IRLD

Institute for Research on Learning Disabilities

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- Referral
- Identification/Classification
- Intervention Planning and Progress Evaluation
- Outcome Evaluation

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Abstract

Thirty-four third and fourth grade students were observed over two entire school days to examine the nature of instruction and academic responding time for LD and non-LD students. Across students, a typical school day was characterized by a limited amount of academic responding (about 45 minutes). Comparison of LD and non-LD students revealed that, while there were no differences in time allocated to instruction, there were differences in the type of instruction received, with LD students receiving more individual instruction and more teacher approval than non-LD students. LD students were engaged in five of seven academic responses for greater amounts of time than non-LD students, while non-LD students were engaged in one academic response for a greater amount of time than LD students. However, there were no differences in the total academic responding times of the two groups of students. Findings related to variability among students and relationships between responding times and achievement also are presented. The implications of the findings for instruction and for special education decision making are discussed.

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Academic Responding Time for LD and Non-LD Students

Learning disabled (LD) and non-learning disabled (non-LD) individuals have been compared to each other since the category of "learning disabilities" was established. Long lists of characteristics of students who are learning disabled have been developed; yet, the identification of the LD student has been a topic of considerable controversy. Recent evidence suggesting that there are few differences between students who now receive LD services and low-achieving students who do not receive LD services (Warner, Alley, Deshler, & Schumaker, 1980; Ysseldyke, Algozzine, Shinn, & McGue, 1979, in press) has led some individuals to suggest that LD students simply are the lowest in the group of students demonstrating poor academic achievement (Algozzine, Forgnone, Mercer, & Trifiletti, 1979; Algozzine, Ysseldyke, & Shinn, 1980, in press; Deshler, 1981; Ysseldyke & Algozzine, 1979).

Despite the controversy over who the LD student is, the fact remains that many students now receive special education services because it has been decided that they are learning disabled.[1] The education of these students is said to be "special," designed to meet their special needs because of their special problems brought about by their learning disabilities. Specialists have been trained specifically to deal with these students. The belief is that the school day for these students must somehow be different from the school day of typical students so that the LD students can profit from their educational experiences.

The school day of a typical student consists of a variety of activities. Some of the activities are academic in nature; others are not

(e.g., recess, transitions between subjects, etc.). Even during academically-oriented activities, students spend their time making a variety of responses. Some of these responses are relevant to the academic activity while others are not. Graden, Thurlow, and Ysseldyke (1982) cited numerous studies indicating that the nature of students' responses in the classroom is important in determining how much students learn in school. The argument is that students must be engaged actively in making academic responses in order to achieve.

Several research procedures have been used to demonstrate the relationship between learning time and academic achievement (cf. Graden et al., 1982). One of the more fruitful approaches involves the observation of students during school. Although two major research endeavors have used an observational approach (cf. Berliner, 1979; 1980a, 1980b; Borg, 1980; Fisher, Berliner, Filby, Marliave, Cohen, & Dishaw, 1980; Greenwood, Delquadri, Stanley, Terry, & Hall, 1981; Hall, Greenwood, & Delquadri, undated; Rosenshine, 1980), the samples of students they have observed have been limited (cf. Graden et al., 1982).

Recently, some attention has been given to what happens to students labeled "learning disabled" and what those LD students do when they are in school. Much of the research in this area has been conducted at the University of Kansas Institute for Research in Learning Disabilities. This research, focusing on secondary school-identified LD students in mainstream classrooms, was summarized by Clark (1981). In an investigation of the demands on oral language skills of LD students (Moran, 1980), it was found that teachers rarely reinforced appropriate behaviors or corrected inappropriate activities. Further, the students

spoke only once for every four teacher utterances. These findings, as well as several others, were derived from transcribed tapes of class sessions lasting from 45 to 50 minutes. In observing the study behaviors, social behaviors, and classroom conduct behaviors of secondary LD and non-LD students (Schumaker, Sheldon-Wildgen, & Sherman, 1980), many similarities and few differences were found between the two groups. Some differences were found in the students' study behaviors, with LD students spending more time and greater lengths of uninterrupted time in reading, writing, and note taking than non-LD students. LD students also spent somewhat more time involved in rule violations than did non-LD students. Very little interaction between students and teachers was found for both groups of students. In another observational study (Skrtic, 1980), student-teacher interactions of secondary LD and non-LD students were the focus of comparison. Interactions between the teacher and the LD and non-LD students were found to be similar: teachers called on and offered assistance to LD and non-LD students with equal frequency; the two groups of students volunteered answers and requested help equally often; and, students received about the same proportion of approval and disapproval. These findings were replicated in a study by Powell, Suzuki, Atwater, Gorney-Krupsaw, and Morris (1981). However, Powell et al. noted that observation codes that are more specific than those they used might detect differences in the ways LD and non-LD students interact with their teachers.

The interactions of regular classroom teachers with third-grade school-identified LD students were compared to teachers' interactions with nonhandicapped high achievers, nonhandicapped low achievers,

and behaviorally handicapped students by Thompson (1979). Several significant differences were found. Teachers initiated more interactions overall with LD students than with high-achieving students. LD students also received more teacher feedback overall than did high-achieving students. When compared to behaviorally handicapped students, the LD students received fewer low level questions from their teachers. No differences were noted between low-achieving students and students labeled LD. Thompson used an observation system developed by Brophy and Good (1969), in which only dyadic interactions between the student and the teacher are observed; in this system, no attempt is made to code all classroom behavior.

Another observational study focused on instruction for LD students within the special classroom (Zigmond, Vallecorsa, & Leinhardt, 1980). These investigators found that much of the school day was spent making responses unrelated to academics. They found that although the student was in school for approximately 287 minutes each day, nearly one hour was spent in waiting or management responses; adding off-task time to these accounted for one-third of the student's day. Analyses of reading time and reading achievement (Leinhardt, Zigmond, & Cooley, 1980) demonstrated a positive relationship between the two.

The present study was undertaken to examine the nature of instruction and academic responding time for school-identified LD and non-LD students. Observation procedures were selected to avoid some of the difficulties encountered in other studies of classroom variables related to students' learning and students' characteristics (cf. Graden et al., 1982).

Research Questions

Numerous research questions were posed in this investigation. Of these, eight were considered to be of major interest for the present report on the nature of LD and non-LD students' instructional and responding times.

(1) To what extent are there significant differences between LD and non-LD students in time allocated to various activities?

(2) To what extent are there significant differences between LD and non-LD students in time allocated to academic versus non-academic activities?

(3) To what extent are there significant differences between LD and non-LD students in time allocated to various tasks?

(4) To what extent are there significant differences between LD and non-LD students in time allocated to various teaching structures?

(5) To what extent are there significant differences between LD and non-LD students in time allocated to various teacher positions?

(6) To what extent are there significant differences between LD and non-LD students in time allocated to various teacher activities?

(7) To what extent are there significant differences between LD and non-LD students in time spent in various student responses?

(8) To what extent are there significant differences between LD and non-LD students in time spent in academic responding, task management, and inappropriate behaviors?

Other research questions posed in this investigation dealt with specific combinations of the 53 events that were observed. For example, one question examined the extent to which there were significant differences between LD and non-LD students in time spent in various student responses as a function of the teaching structure. Another involved

the extent to which there were significant differences between LD and non-LD students in time spent in various student responses as a function of the teacher activity during reading. Twenty-two research questions of this type were analyzed in the present study. The findings from these additional research questions will be highlighted in the present report.

In addition to the research questions dealing specifically with differences between LD and non-LD students in terms of time spent in various instructional and responding categories, the present research also addressed: (a) what the "typical" school day is like for elementary students, (b) the relationship between time spent in various student responses and achievement, and (c) differences between LD and non-LD students that were not coded by the observational system.

Method

Subjects

Thirty-four students from 17 classrooms in nine elementary schools in a suburban school district served as subjects. The students were in grades three (N=20) and four (N=14); 24 were male and 10 were female. The homeroom teachers of these students included 12 females (9 3rd grade, 3 4th grade) and 5 males (1 3rd grade, 4 4th grade).

All teachers and students were volunteer participants in the observational study. At the beginning of the school year, the school district sent consent forms to all teachers and to the parents of all students within the target grade levels in 10 designated schools.

In the selection of subjects, LD students were selected first by randomly picking from third and fourth grade students who were on the

schools' LD rolls by late fall. A non-LD peer was then selected for each LD student by randomly selecting from the names of same-sex students in the LD students' homerooms. LD students were in resource rooms an average of 77.4 minutes per day (range = 0 - 225 minutes).

Observation System.

The CISSAR (Code for Instructional Structure and Student Academic Response) observation system was used in this study. The version of the system employed was developed by the Juniper Gardens Children's Project in Kansas City, Kansas (Greenwood, Delquadri, & Hall, 1978). The system focused the observation on the behavior of one target student (rather than sampling behaviors of several students) and allowed observers to record six event areas: (a) activity (12 codes), (b) task (8 codes), (c) teaching structure (3 codes), (d) teacher position (6 codes), (e) teacher activity (5 codes), and (f) student response (19 codes). Seventeen stop codes also were used to record reasons for termination of observation. Table 1 is a list of the event areas and the specific events recorded within each area. Detailed definitions and examples are presented in Appendix A. Excluding the stop codes, a total of 53 different events could be recorded with the CISSAR system.

Insert Table 1 about here

An interval time sampling technique was used to direct the recording of events. Three event areas were recorded every 10 seconds over the entire school day while the student was in the classroom. Coding was structured into blocks of seven 10-second intervals. During the first

10-second interval, activity, task, and teaching structure were recorded. During each of the next six 10-second intervals, teacher position, teacher activity, and student response were recorded. This pattern was maintained throughout the observation.

An auditory electronic timer housed on a clipboard was used to signal the 10-second intervals. The timer was equipped with an earplug so that only the observer could hear the signal (a short beep sound). The clipboard was used to hold coding sheets and to provide a hard surface for marking events.

The coding sheets, modeled after those used by the Juniper Gardens Children's Project (Stanley & Greenwood, 1980), were designed at Minnesota's Institute so that they could be read automatically by an optical scanner (see Appendix B). To be read correctly by the scanner, the circles on the coding sheet had to be very dark and completely filled. In addition to spaces for coding student identification and start and stop times, each sheet contained three blocks representing 70 seconds each. Each completed sheet represented 3.5 minutes of observation time.

Observers

Twelve individuals served as observers during the present study. Ten of the observers were responsible for the majority of the observations. The other two observers were substitutes who filled in for reasons of sickness, make-up observations, and so on. These substitute observers were Institute staff members who conducted observer training sessions and monitored the regular observers. The regular observers were all females who had been selected from a pool of 50 female applicants who had

responded to an ad in a local newspaper. A prerequisite for consideration was that the applicant not have a background in education; the goal was to minimize biases that might be brought to the classroom setting. Additional selection criteria included average or above average reading ability and performance on selected parts of a general clerical skills test. A personal interview with one of two Institute staff members comprised the final step of selection.

Of the 10 selected observers, three had attended college for at least one year and one had a B.A. Two others had completed a business or vocational school program. Previous employment varied greatly, including sales, clerical, foster parent, own business, and social worker. All but two observers had a child or children in elementary or secondary school. Observers did not work in schools in which their children were enrolled.

Procedures

Observer training. Training of observers in the observation system was accomplished through the use of an Observer and Trainer's Manual (Stanley & Greenwood, 1980). The manual presented eight units that, according to the authors, were sequenced in terms of the complexity of the recording skills covered. Training required observers to read materials and then practice coding small numbers of events through the use of a variety of other media, including flashcards, overheads, and videotapes. Exercises and quizzes were presented throughout the manual. Mastery (100% correct) of the material in each unit was required before continuating in the training to the next unit.

Training in the system was conducted by four Institute staff members. Two weeks of half-day training sessions were required to cover the material presented in the manual. This was followed by two to three days of practice coding within actual classrooms.

Data collection. The trained educational observers coded activities on either a whole-day (one observer all day) or half-day (one observer for morning, another for afternoon) basis. Typically, observers did not code continuously for a period of more than 1 1/2 - 2 hours because of breaks within the school day. Observations were not conducted during breaks, such as those for lunch, recess, and bathroom. Also, observers did not code during physical education, music, or special assembly programs since the observation system did not apply to these situations. Observers did follow target students when they left their homerooms to go to other classrooms for other subjects (typically reading and/or mathematics), or when they went to a resource teacher for special instruction. Coding was conducted in these other classrooms in the same manner as in homerooms. Regardless of the physical setting, observers attempted to position themselves to be unobtrusive and to avoid revealing the identity of target students to the target students themselves or to other students.

Use of the optical scanner coding sheets typically required observers to mark only slashes in the appropriate circles while observing because the 10-second interval did not provide enough time for circles to be darkened sufficiently to be read accurately by the optical scanner. As a result, observers darkened the slashed circles after the actual observation was completed, either during break periods, in the evenings, or

on the weekends. This procedure tended to reduce errors in the coding of data.

Frequently, the coded observational data were supplemented with an anecdotal recording. Generally, anecdotal recordings were used to provide a description of the classroom setting, the target student, and anything unusual that may have occurred during observations. The observers were provided with guidelines for anecdotal recordings (see Appendix C) to help them determine when they were needed and what they should cover.

Each target student was observed for two full days by the trained educational observers. The decision to collect two days of data on each student was based on stability analyses presented by Greenwood et al. (1981), in which they found one day of observation predicting 62% and 92% of the variance for activity and student response, respectively. Student pairs (LD and non-LD) were always observed on the same days; however, an attempt was made to schedule the two days of observation for different days of the week. Typically, these two days were consecutive. All observations (2 days for 34 students) were completed between January and March.

In the present study, it was impossible to keep observers blind as to the classification of the students they observed since the LD students typically met with an LD resource teacher for some part of the day (and thus, were followed to the LD classroom by the observer). Similarly, it was difficult to keep teachers unaware of the identity of the LD students being observed. To equalize the effect of teacher awareness of who was being observed, teachers were asked to point out to the observers the two students who were to be observed in their classes.

Reliability. Reliability checks were conducted during training and during another observation study that took place over a two-month period immediately preceding this study. These checks were conducted by the observer pairs within each room; one of the two observers was designated randomly as the reliability observer. This observer stopped observing her target student and coded events on the same student as the other observer in the classroom for approximately 14 minutes (4 pages of observation). During the study, 41 reliability checks were completed.

Two types of reliability were checked: (a) behavioral, and (b) sequential. Behavioral reliability was a measure of observer agreement on a specific event being observed; behavioral reliabilities were calculated for (a) teacher position, (b) teacher activity, and (c) student response. The second type of reliability, sequential reliability, was a measure of observer agreement on the sequence of items; this measure was designed to document that observers were coding in the sequence required by the observation system. According to the CISSAR training manual, the desired levels of reliability were 90% for behavioral reliability and 85% for sequential reliability. Table 2 is a summary of the observers' reliabilities.

Insert Table 2 about here

Because of the desire not to lose observation data on any of the subjects (which occurred when the reliability observer stopped to watch the other observer's student), reliability checks were not conducted during the current study, except at the study's onset. At that time,

the Institute staff members who had been responsible for training served as reliability observers. It was noted at that time that some observer drift seemed to have occurred (possibly due to the one-month period over Christmas vacation of no observations between this study and the one immediately preceding it). A special meeting was held to review definitions and clarify where drift seemed to be occurring (mainly in the area of teacher behavior). Then, to maintain adequate levels of reliability throughout the study, meetings were held to discuss coding problems, reliability disagreements, and so on. These were held on a weekly basis for the first two weeks of the study, and then on a bi-weekly basis after that. At the meetings, definitions were reviewed and any disagreements were resolved.

Achievement testing. At the end of the school year, students were administered the Peabody Individual Achievement Test (PIAT; Dunn & Markwardt, 1970) by trained testers. Four of the educational observers and four Institute staff members served as testers of the non-LD students. Observers were not permitted to test students they had observed. LD personnel within the school system tested the LD students. The PIAT was administered to a total of 25 students who had been observed (73.5%). The remaining students were not tested either because they had moved (5.9%), because parental permission for testing or providing test scores to Institute staff was not given (11.8%), or because the school system's LD staff had decided that a fall testing would be more appropriate (8.8%). PIAT data were available for 12 of the LD students (70.6%) and 13 of the non-LD students (76.5%).

In addition to the end-of-the-year PIAT scores, a select number of the LD students had been administered the PIAT at the beginning of the academic year or at some time previous to that. These "pre" scores were available for 11 of the LD students for whom end-of-the-year scores were available.

Data Analysis

Total amounts of time each student spent in the 53 observed events and in five event composites (academic activities, non-academic activities, academic student responses, task management student responses, inappropriate student responses) over the two days of observation comprised the dependent measures that were analyzed in this study. However, for descriptive purposes, these times were transformed to represent the time spent in each event during one school day. Because the observation system was designed to record as much data as possible during each 10-second interval, the activity, task, and structure were coded once every 70 seconds, while the teacher position, teacher activity, and student response were coded six times every 70 seconds. Thus, transformations of times from the recording system produced slight overestimates of the time spent in each activity, task, and structure, and slight underestimates of the time spent in each teacher position, teacher activity, and student response. The transformed times appear in all figures and tables, but were not used in the actual data analyses.

All data were analyzed using *t* tests to identify significant differences ($p < .05$) between the LD and non-LD group means. Further, because some of the significant *t*s might occur by chance due to the large number of *t* tests conducted, only those findings that exceeded the number that

would be expected by chance for each research question (5%) are reported.[2]

Students' end-of-the-year PIAT data (standard scores) were correlated with their student response times. Further, for those LD students having both pre and post scores on the PIAT, correlations were calculated between the changes in their PIAT raw scores and their student response times.

Results

A Typical School Day

Direct observation was used to assess the amount of time each target student spent in each activity, task, structure, teacher position, and teacher activity; these times are referred to as allocated times. It is important to distinguish between allocated time and scheduled time. Scheduled time is derived from teacher or school reports of how much time is planned for activities. In contrast, allocated time is measured by direct observations of how much time actually is spent in various class activities, tasks, structures, teacher positions, and teacher activities. Time spent by each target student making each behavioral and learning response also was assessed by direct observation; these times are referred to as engaged times. Only those engaged times that involved actual active, observable learning responses are referred to as active academic responding times.

A depiction of a typical school day for the 34 students observed in the present study is included in Figures 1-6. These figures represent the average time devoted to each activity, task, structure, teacher position, teacher activity, and student response for all students, both LD and non-LD. As is evident in these figures, almost one-half of the school

day was not observed because students were involved in activities not included in the observation system such as lunch, recess, music, moving between classrooms, bathroom breaks, etc. During observed time, most time was allocated to academic activities, with reading and math being the specific activities to which the most time was devoted, averaging about one hour and about 45 minutes, respectively (see Figure 1). The major task for students was readers, followed by other media, workbooks, worksheets, and paper and pencil tasks (see Figure 2). Students clearly received most of their instruction within an entire group structure (see Figure 3). Most frequently, the teacher was positioned among students or in front of the class (see Figure 4). No response to the target student was the most frequent teacher activity, followed by teaching (see Figure 5). Student responses were most often task management responses, especially passive responses such as listening to the teacher, waiting to talk to the teacher, and so on (see Figure 6). For student responses that were academic in nature, most time was spent writing. Inappropriate student responses accounted for about 30 minutes of the student's school day.

Insert Figures 1-6 about here

Variability. The times presented in Figures 1-6 represent average times across all students observed in the study; they give no indication of the extreme variability observed in the times for individual students. The average times and ranges of times for some of the events showing the greatest variability are given in Table 3. The average times and ranges of times for all observed events are presented in the tables in Appendix

D. As is indicated in these tables, large differences in times existed among students. For example, on the days observed, no time was allocated to workbook tasks for one student while almost 1 1/2 hours was allocated to workbook tasks for another student; one student received 24 seconds of instruction with the teacher at his/her side while another student received over one hour of instruction with the teacher at his/her side. The extreme variability in times for individual students should be kept in mind when considering the average times found for the various events that were observed.

Insert Table 3 about here

Comparisons of LD and Non-LD Students

Activity. The average amounts of time allocated to various activities during one school day for LD and non-LD students are presented in Table 4. No significant differences were found in the amounts of time allocated to each activity for the two groups of students. As noted earlier, most time was allocated to reading (about 63 minutes), followed by math (about 43 minutes) and language (about 28 minutes). An average of less than 15 minutes per day was allocated to each of the other activities.

Insert Table 4 about here

The percentages of observed time allocated to each activity for the LD and non-LD students also are given in Table 4. For both groups, about 30% of the observed time was allocated to reading; about 20% was

allocated to math, and about 13% was allocated to language. The percentage of time allocated to each of the other activities was less than 10% of the observed day.

Activity composites. In analyzing the time allocated to various activities for LD and non-LD students, composites were formed of the times allocated to academic activities (reading, math, spelling, handwriting, language, science, and social studies) and non-academic activities (arts/crafts, free time, business management, and transition). The average amounts of time allocated to these two activity composites during one day for LD and non-LD students are shown in Table 5; differences between groups were not significant. Both groups had most time allocated to academic activities, averaging about three hours per day.

Insert Table 5 about here

The percentages of time allocated to academic and non-academic activities (see Table 5) show that academic activities accounted for about 85% of the student's observed day on the average, for both LD and non-LD students.

Task. Table 6 is a summary of the average amounts of time allocated to various tasks during one school day for LD and non-LD students. One significant difference was found; LD students received more time with other media (e.g., films, teaching machines, flashcards) than did non-LD students, $t(32) = 2.61$, $p = .014$. LD students were allocated about 46 minutes per day for other media tasks, while non-LD students received about 32 minutes. The amount of time allocated to other media tasks for both groups of students was exceeded only by the amount of time using

readers, which averaged about 58 minutes per day for LD students and 76 minutes per day for non-LD students. The least amount of time for both groups of students was allocated to listening to teacher lectures (less than 5 minutes per day).

Insert Table 6 about here

The percentages of observed time allocated to each task for the LD and non-LD students also are presented in Table 6. Non-LD students used readers during 35% of the observed time, while LD students used readers about 27% of the time. LD students were involved in other media tasks for about 22% of the time; non-LD students were involved in such tasks about 14% of the time. Only about 2% of the observed time was allocated to listening to lectures for both groups of students.

Teaching structure. Significant differences between LD and non-LD students emerged in time allocated to entire group and individual teaching structures (see Table 7). While both groups received most instruction in entire group structures, non-LD students received more instruction within the entire group (about 2 3/4 hours per day) than did LD students (about 2 1/4 hours per day), $t(32) = 2.26$, $p = .031$. Conversely, LD students received more individual instruction (about 35 minutes per day) than did non-LD students (about 3 minutes per day), $t(32) = 3.92$, $p = .000$. Both groups of students were allocated about 45 minutes per day for small group instruction.

Insert Table 7 about here

As indicated by the percentages in Table 7, over 60% of the time LD students were observed and over 75% of the time non-LD students were observed, the student was within the entire group structure. Approximately 20% of observed time, the student was in a small group structure. While LD students were in individual structures about 16% of the observed time, only 1.4% of the non-LD students' observed time was allocated to individual structures.

Teacher position. The average amounts of time during which LD and non-LD students received instruction with the teacher in various positions relative to the students being observed are shown in Table 8. A significant difference was found in the amount of time students received instruction with the teacher at their side, $t(32) = 3.99$, $p = .000$. The teacher was at the side of the LD students for approximately 20 minutes, but at the side of non-LD students for only about 3 minutes per day. For both groups, the teacher was among the students for the greatest amount of time. For less than 10 minutes each day, the teacher was in back of the class (about 7 minutes) or out of the room (about 5 minutes)

Insert Table 8 about here

The percentages in Table 8 confirm that a striking difference existed in the percentage of the student's school day during which the teacher was at the student's side--11.3% for LD students vs 1.4% for non-LD students. The teacher was among the students for approximately 40% of the day for both LD students and non-LD students. The next

most frequent teacher positions were in front of the class (about 24% of the observed day) and at the teacher's desk (about 21% of the observed day). Thus, although LD students spent significantly more time with the teacher beside them than did non-LD students, the time spent with the teacher in this position was less than half the time spent with the teacher at the teacher's desk.

Teacher activity. Table 9 is a list of the average amounts of time the teacher was involved in various activities with LD and non-LD students during one school day. For both groups, the teacher was making no response to the target student for the greatest amount of time (approximately 1 3/4 hours). The teacher directed teaching activities for about one hour per day for both groups. The teacher gave small amounts of either approval or disapproval to the target students. However, the LD students did receive significantly more teacher approval (about one-half minute per day) than did the non-LD students (about one-fourth minute per day), $t(32) = 3.27$, $p = .003$.

Insert Table 9 about here

As shown in Table 9, the teacher activities of no response and teaching to the target student accounted for almost the entire observed day, with no responses occurring about twice as often as teaching activities. It is noteworthy that both teacher approval and teacher disapproval of the target students occurred during less than 1% of the total time observed.

Student response. Significant differences emerged between LD and

non-LD students for times engaged in six student responses (see Table 10). Non-LD students spent more time writing (about 30 minutes per day) than LD students (about 22 minutes per day), $t(32) = 2.29$, $p = .029$. LD students spent more time than non-LD students engaged in the other five responses for which significant differences were found: playing academic games (3 minutes vs. 1 minute; $t(32) = 2.12$, $p = .041$), reading aloud (3 1/2 minutes vs. 45 seconds; $t(32) = 2.91$, $p = .007$), talking about academics (5 1/2 minutes vs. 2 minutes; $t(32) = 3.72$, $p = .001$), answering academic questions (2 minutes vs. less than 1 minute; $t(32) = 2.41$, $p = .022$), and asking academic questions (1 minute vs. 25 seconds; $t(32) = 5.21$, $p = .000$). For both groups of students, most time was spent in passive responses (averaging about 1 1/4 hours per day). Both groups of students spent about 15 minutes per day looking around. The times spent in most other student responses were very small.

Insert Table 10 about here

The percentages of time spent in the 19 student responses varied greatly (see Table 10), ranging from an average of .2% to 40.1% of the day for LD students, and from .1% to 44.2% of the day for non-LD students. For both groups of students, passive responses accounted for about 40% of their responding time. The only other response made for more than 10% of their responding time was writing (12.8% for LD students and 16.6% for non-LD students).

Student response composites. Table 11 is a summary of the average amounts of time students spent engaged in active academic responses

(writing, playing academic games, reading aloud, reading silently, talking about academics, answering academic questions, and asking academic questions), task management responses (passive responses, raising hands, looking for materials, moving to new academic stations, and appropriate play), and inappropriate responses (disruption, inappropriate play, inappropriate task, talking about non-academics, inappropriate locale, looking around, and self stimulation). Differences between the groups for the three student response composites were not significant.

Insert Table 11 about here

The percentages of time spent by LD and non-LD students making the three types of student responses also are shown in Table 11. For both groups, over 50% of their responding time was spent in task management responses. About half as much time was spent in making active academic responses (26.6% for LD students and 26.4% for non-LD students). Inappropriate responses accounted for the lowest percentage of time, yet averaged almost 1/5 of the students' responding time during the observed school day.

Highlights of Additional Observation Findings

In addition to the eight major research questions, data for 22 other questions were analyzed. Some of the findings are highlighted here. A complete listing of the additional findings is provided in Appendix E.

Teaching structure as a function of class activity. Although the amounts of time allocated to each activity for LD and non-LD students were not significantly different, significant differences were found in the structures in which they were placed during several activities. During

math, non-LD students received more entire group instruction than did LD students (43 minutes vs. 26 minutes; $t(32) = 3.16$, $p = .003$). LD students received more instruction in individual structures than non-LD students during reading (15 minutes vs. 1 1/3 minutes; $t(32) = 2.68$, $p = .012$), math (10 minutes vs. 50 seconds; $t(32) = 2.03$, $p = .050$), language (3 1/2 minutes vs. 13 seconds; $t(32) = 2.45$, $p = .020$), and free time (1 3/4 minutes vs. 6 seconds; $t(32) = 2.87$, $p = .007$).

Teacher activity as a function of task. Although the amounts of time allocated to workbook tasks for LD and non-LD students were not significantly different, significant differences were found in the teachers' activities while students were using workbooks: LD students received more teacher approval than non-LD students (6 seconds vs. 2 seconds; $t(32) = 2.21$, $p = .034$). When students were using readers, teachers engaged in more non-academic talk with non-LD students than with LD students (55 seconds vs. 27 seconds; $t(32) = 2.11$, $p = .043$).

Student response as a function of task. Although the amounts of time allocated to readers were not significantly different for LD and non-LD students, significant differences were found in their responses while using readers. LD students read aloud more than non-LD students (2 1/2 minutes vs. 30 seconds; $t(32) = 2.22$, $p = .033$) and engaged in more disruption (5 seconds vs. 1/2 second; $t(32) = 2.07$, $p = .046$). Non-LD students spent more time writing than LD students (10 minutes vs. 5 minutes; $t(32) = 3.25$, $p = .003$) and more time moving to new academic stations (1 1/2 minutes vs. 48 seconds; $t(32) = 2.12$, $p = .042$).

Student response as a function of teaching structure. Although the amounts of time allocated to small groups for LD and non-LD students were

not significantly different, significant differences were found in their responses while in small group structures. LD students spent more time reading aloud than non-LD students (1 1/2 minutes vs. 30 seconds; $t(32) = 2.18$, $p = .037$) and in asking academic questions (19 seconds vs. 6 seconds; $t(32) = 2.51$, $p = .017$). Non-LD students spent more time raising hands than LD students (1 minute vs. 15 seconds; $t(32) = 3.03$, $p = .005$) and more time moving to a new academic station (1 1/2 minutes vs. 40 seconds; $t(32) = 2.29$, $p = .029$).

Task as a function of teaching structure during reading. When involved in entire group reading instruction, more time was allocated to worksheets for LD students than for non-LD students (2 3/4 minutes vs. 19 seconds; $t(32) = 2.13$; $p = .041$). Similar differences existed in worksheet use during small group reading instruction for LD and non-LD students (3 minutes vs. no time; $t(32) = 2.05$, $p = .049$).

Achievement Test Results

Comparison of LD and non-LD achievement. The scores of the LD and non-LD students on the PIAT at the end of the school year are presented in Table 12. As shown in the table, the average standard scores of the LD students generally were from 14 to 20 points below the average standard scores of the non-LD students. An exception to this pattern occurred on the General Information subtest, where the average scores of LD and non-LD students were approximately equal.

Insert Table 12 about here

Correlations between achievement and student responses. Correlations were computed between students' standard scores on each PIAT subtest and

the total test with the time engaged in each student response. Table 13 is a list of the significant correlations found between the PIAT and academic student responses for all students, for LD students only, and for non-LD students only. Examination of the table reveals considerable inconsistencies in correlations depending upon the group and the PIAT subtest. However, certain trends are evident for the academic student responses. First, the amount of time a student spent reading silently was related strongly to the student's performance on the reading recognition achievement measure. Second, certain student responses (e.g., reading silently) tended to correlate positively with achievement, while others (e.g., talking about academics) tended to correlate negatively with achievement.

Insert Table 13 about here

Significant correlations found between the PIAT and task management student responses are shown in Table 14. In all but one case, the correlations were negative.

Insert Table 14 about here

Correlations between the PIAT and inappropriate student responses are presented in Table 15. For the overall group of students (LD and non-LD combined), all significant correlations but one were negative. However, for LD students all of the significant correlations were positive, indicating that students spending greater amounts of time making inappropriate responses also tended to obtain higher scores on the PIAT.

Insert Table 15 about here

Correlations between achievement changes and student responses. Although both pre and post scores were available for 11 of the LD students in the present study, records indicated that the pre scores for four students were from PIAT administrations two or more years old and those for another student were over three years old. Thus, only the data from the six students whose pre PIAT scores were obtained approximately one year before the post PIAT scores were included in the present analysis. The average changes in raw scores and the ranges of the changes for these students are shown in Table 16. Mean raw score changes ranged from +2.60 (Spelling) to +9.67 (General Information); the average change in the total score was +17.40. For each subtest, the variability of the changes in scores was great, ranging from a 9-point difference to a 21-point difference between the largest negative change and the largest positive change on one subtest.

Insert Table 16 about here

Significant correlations between the PIAT change scores and student responses are presented in Table 17. Despite the fact that the small number of students makes it difficult to identify correlated variables, several significant correlations were obtained. Four academic responses were related to achievement gains; writing, reading aloud, and answering academic questions were positively related to gains on various subtests, while asking academic questions was negatively related to gains. One task management response, appropriate play (teacher-sanctioned play), was

positively related to achievement gains. Two inappropriate student responses (inappropriate locale and look around) were negatively related to achievement gains.

Insert Table 17 about here

Anecdotal Records

Descriptions of the classroom setting and target students were written by the observers, when possible, to document qualitative characteristics that might not be evident from the observational records. Anecdotal records were completed for 15 pairs of students (a pair consisted of one LD student and one non-LD student from the same classroom). Qualitative data related to the target student's location in the classroom, physical appearance, relationship with the teacher, relationship with peers, and attention to task are summarized here.

Location in classroom. The location of three LD students and two non-LD students was in the middle of the room. Five LD students and nine non-LD students were seated in the front area of the room, while six LD and three non-LD students were seated in the back of the room. In one classroom, the position of both the LD and non-LD student was described as variable, with the teacher changing seating positions of students during the day.

Physical appearance. Most students were described by the observers as being average, or similar in appearance to the students' peers. Seven LD students were characterized as less neat (dirty clothes, poorly dressed, messy hair), and four were described as being somewhat different physically (chunkier, taller, strange eye movements). Three

non-LD students were characterized as slightly different in some respect; two were described as less neat (not as well dressed, messy), and one was described as somewhat different physically (eyes look different).

Relationship with teacher. The relationship between the target student and his/her teacher was described relative to the relationship between other students in the classroom and the teacher. For LD students, the student-teacher relationship was described as somewhat different for seven students. Four of these involved the teacher giving more attention to the student; two involved the student attempting to get more attention from the teacher. One involved a relationship in which the teacher ignored most of what the student did; however this same relationship was described for the non-LD student in the same classroom. For non-LD students, the student-teacher relationship was described as somewhat different for four students. In addition to the one noted above (teacher ignored student), one involved the teacher showing favoritism toward the student, one involved the teacher giving more attention to the student because of inappropriate behaviors; and one involved the student attempting to get more attention from the teacher.

Relationship with peers. The relationship between the target student and his/her peers was described as average for most students. The peer relationships for three LD students were described as being somewhat atypical (student is a bully, student is loud and receives many negative comments from peers, peers look down on student) and two non-LD students (peers laugh at and tease student, student likes to destroy work of peers).

Attention to task. The target student's attention to task was described as variable or poor for eight LD students and for five non-LD

students. In some cases, it was noted that the student was off task unless under close supervision. One LD student was described as being on task with the LD teacher but off task with the regular classroom teacher, while another student was described as off task with the LD teacher but on task with the regular classroom teacher.

Discussion

The observation of LD and non-LD students revealed several major findings. First, there were no differences in time allocated to instruction for the two groups of students. Essentially the same amounts of time were allocated to academic activities, to non-academic activities, and to each specific activity (reading, math, etc.) for LD and non-LD students. For both groups, about 85% of the observed day (or, about 45% of the time they were at school) was allocated to academic activities, with most of that time (about 30% of the observed day or 15% of the time they were at school) allocated to reading. However, there were differences between LD and non-LD students in the type of instruction received: LD students received significantly more individual instruction and significantly less entire group instruction than non-LD students. And, in agreement with this, LD students received significantly more instruction with the teacher at their side than non-LD students. Further, LD students received about three times as much teacher approval as non-LD students; however, the average times were both very small (36 seconds and 12 seconds per day for LD and non-LD students, respectively).

Despite the differences found in type of instruction, teacher position, and teacher activity for LD and non-LD students, there were

no significant differences in the total academic responding time (the time that the student actually was engaged academically in learning) for the two groups of students. However, there were some differences between LD and non-LD students in some types of academic responding. LD students spent more time than non-LD students engaged in playing academic games (about 3 1/2 minutes per day for LD versus 1 minute for non-LD), reading aloud (about 3 3/4 minutes per day for LD versus about 45 seconds for non-LD), talking about academics (about 5 1/2 minutes per day for LD versus 2 minutes for non-LD), answering academic questions (about 2 minutes per day for LD versus about 45 seconds for non-LD), and asking academic questions (about 1 minute per day for LD versus about 25 seconds for non-LD). On the other hand, non-LD students spent more time engaged in writing than LD students (about 30 minutes per day for non-LD versus about 22 minutes for LD). Many of these differences appear to be related to the differences in the type of structure in which the two groups received instruction. For instance, LD students spent significantly more time than non-LD students engaged in playing academic games, reading aloud, talking about academics, answering questions, and asking questions when they were in individual instruction, while non-LD students spent significantly more time than LD students engaged in writing and reading silently during entire group instruction.

Another major finding was that there were no significant differences found in total times students spent making inappropriate responses, nor in the times spent making each specific type of inappropriate response. Similarly, both LD and non-LD students spent essentially equivalent amounts of time making task management responses. The task management

responses accounted for over 50% of the students' total responding time. Academic responding accounted for about 25% of the students' responding time, and inappropriate responses accounted for over 15% of the students' responding time.

Perhaps the most striking finding was the small amount of academic responding time for both LD and non-LD students. Academic responding time accounted for only 25% of the students' responding time, which translates to approximately 47 minutes per day. In a school year consisting of about 160 days, this means a student, on the average, spends 125 hours making academic responses while in school a total of about 1040 hours. The average LD student spends about 9.9 hours reading aloud during the school year, while the average non-LD student spends about 1.9 hours reading aloud during the school year. In contrast, the average student spends about 200 hours making passive responses during the school year.

The implications for the time a student is engaged in various types of responses are even more striking when the extreme variability between students is considered. One student in the present study spent an average of 136.40 minutes in passive responding during one day; this translates to about 363.7 hours over the school year. Another student spent an average of 25.15 minutes in inappropriate play during one day; this translates to about 67.1 hours over the school year. Yet, other students spent only 26.50 minutes per day in passive responding and 0.25 minutes per day in inappropriate play; over the school year, these amount to about 70.7 hours and 40 minutes, respectively.

The time percentages found in the current study agree with those reported by other investigators. As in the present study, Hall et al.

(undated) and Greenwood et al. (1981) found that during only 25% of the instructional day (the part of the day that could be observed) was the student actually engaged in making an academic response. Similarly, students spent about 53% of the instructional day in task management responses and 18% of the day in inappropriate behaviors; these percentages are very close to those found in the present study. The specific times reported by Hall et al., however, were somewhat higher than in the present study because of a longer instructional day. Students observed by Greenwood et al. spent about 68 minutes per day in academic responding, compared to about 47 minutes per day in the present study.

Despite the large differences between the responding times of individual students in the present study, the relationship between responding time and achievement was not clear. Perhaps the clearest finding was that a negative relationship exists between the time spent in task management responses and achievement. This finding certainly has important implications given that students spend over 50% of each school day making such responses. Also, the results suggested that certain types of academic responses, at least when made by some students (e.g., LD students asking academic questions) may be related negatively to achievement. This finding may be related to the quality of the academic responding time reflected in such responses. For example, there certainly are differences between an academic question of the type, "What page should I be reading?" and one of the type, "What does this word mean?" It is reasonable to assume that similar differences exist in the types of academic statements that might be made by students.

There are several possible reasons for the fact that this study did not find the strong relationships between active academic responding and achievement found in other studies (Borg, 1980; Cooley & Leinhardt, 1980; Gaver & Richards, 1979; Good & Grouws, 1977; Greenwood et al., 1981; McKinney, Mason, Perkerson, & Clifford, 1975; Stallings, 1975). First, the PIAT is a more global measure of achievement than those used in several of the studies. A more content-specific test may have revealed greater relationships between student responding and achievement. Related to this is the fact that for most students, an attempt was made to correlate student responding times to end-of-the-year PIAT scores. If changes in PIAT scores over the school year had been available, greater relationships might have been found. Although change scores were available for some LD students, the small number results in highly tenuous correlations. Even so, most of the correlations with the change scores were in the direction of the correlations reported in other studies. Another possible reason for the failure to find strong relationships between responding times and achievement relates to the student population. The LD students in the present study had significantly lower PIAT scores, yet because of the nature of instruction they received, also spent significantly more time making many of the active academic responses. The caution raised by Graden et al. (1982) is important to remember here. Despite the negative correlations, it is inappropriate to conclude that more active academic responding leads to poorer achievement.

As other researchers have noted, the present study points to the importance of looking not only at quantity of academic responding, but

also at quality of that responding time. Although LD and non-LD students may spend equivalent amounts of time in silent reading, a qualitative analysis would help to identify whether the time was spent equally efficiently by the two groups. Even in those cases where LD students seemed to have a great advantage over the non-LD students, such as in the amount of individual instruction, qualitative analyses would help to clarify the benefits to be received from the additional time.

The results of the current study also have implications for the special education decision-making process in today's schools. Students who have been identified and placed within LD service programs apparently do accrue certain benefits from being placed within the programs. They receive more individual instruction and more teacher approval. Further, even though their total academic responding time is not different from that of non-LD students, they do spend more time actively engaged in five out of seven academic responses. Although IRLD research has suggested that there is little basis for current eligibility and placement decisions (Algozzine & Ysseldyke, 1981; Algozzine, Ysseldyke, & Shinn, in press; Epps, McGue, & Ysseldyke, in press; Potter, Ysseldyke, Regan, & Algozzine, in press; Ysseldyke, Algozzine, Richey, & Graden, in press), the placement decision may result in significant benefits to the students. Whether the benefit of increased time outweighs the detrimental effects of being labeled requires further research, as does the relationship between increased time and achievement changes. Similarly, research is needed on the extent to which the increased times occur for students of varying

degrees of disability (cf. Poplin, 1982), and the extent to which times change as a function of the length of time the student has been receiving services.

In discussing the benefits of special education LD placement, the assumption is that LD students are allocated more individual instruction and more teacher approval, and more often are given opportunities to engage in certain types of active academic responses, during the times when they are in the LD resource room. Data to support or refute this assumption are not available from the current analyses. Future analyses will address the important issue of where increased times are occurring for LD students.

While the current observational findings have clear implications for educational practice, the manner in which the results are interpreted and applied to the classroom is critical in determining the extent to which changes occur. The limited amounts of time in which students were engaged in active academic responding are not unique to one student, one teacher, one school, or even one district. The responsibility for how students spend their time in school must be shared by all involved in education, including those in university teacher training programs. With cooperative efforts by educators at all levels, students can be provided with more opportunities to respond while in the classroom, and teachers can be provided with organizational supports that allow more of the scheduled day to be devoted to instruction.

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Footnotes

The observational research reported here was part of an extensive project that could not have been completed without the cooperation and help of numerous individuals. Foremost among these were the administrators, teachers, and students in the school district in which the research was conducted. Equally important to the successful completion of the research were the observers; all were committed to providing an accurate, objective picture of the school day. Listed alphabetically, the observers for the present study were: Deborah DeCoux, Barbara Flykt, Eileen Mevissen, Donna Miller, Rose Marie Plant, Cheryl Randklev, Judith Rygwall, Yvonne Shafranski, Wendy Studer, and Geraldine Webster. In addition, the assistance of Sandra Christenson during observer training is gratefully acknowledged. The special assistance of Charles Greenwood and Sandra Stanley, University of Kansas, in the implementation of their CISSAR observational system was appreciated greatly, as was the data analysis expertise provided by Bob Algozzine, Matthew McGue, and Jing Jen Wang. Also essential to the completion of the project were the contributions of psychometric assistants Barbara Anderson, Lisa Boyum, Yetta Levine, and Cathy Walters. Further, the excellent secretarial services provided by Audrey Thurlow and Marilyn Hyatt made the entire research process easier than it would have been under normal conditions.

[1]Throughout this report, "LD" is used to refer to students labeled LD by the schools. Schools use a variety of approaches in assigning this label.

[2]For each research question, the number of possible significant findings (i.e., the number of variables) was tabulated and then a

five percent cutoff point was determined. For example, for the first research question, 11 significant findings were possible; the cutoff point thus was .55. Findings for a given research question were considered to be meaningful only when the number of significant t test findings was greater than the five percent cutoff point. Thus, for a research question encompassing 209 variables, the differences indicated by a total of 10 significant t tests would not be considered meaningful (the cutoff point would be 10.45), whereas for a research question encompassing 152 variables, the differences indicated by a total of 10 significant t tests would be considered meaningful (the cutoff point would be 7.60).

Table 1

CISSAR Event Areas and Specific Events Coded[a]

Event Area	Specific Events Coded
Activity - type of instruction being provided/established by teacher	R - Reading M - Math S - Spelling H - Handwriting L - Language Sc - Science Ss - Social Studies Ac - Arts/Crafts Ft - Free Time Bm - Class Business/ Management Tn - Transition Ct Can't Tell
Task - curriculum task or verbal instruction mode in which student is expected to engage	Br - Readers Wb - Workbooks Ws - Worksheets Pp - Paper and Pencil Ll - Listen to Teacher Lecture Om - Other Media Tsd - Teacher-Student Discussion Fp - Fetch/Put Away
Teaching Structure - physical arrangement of student in class	Eg - Entire group Sg - Small group I - Individual
Teacher Position - location of teacher	IF - In Front of Class AD - At Desk AS - Among Students O - Out of Room S - Side B - Back
Teacher Activity - response of teacher to target student	NR - No Response T - Teaching OT - Other Talk A - Approval D - Disapproval
Student Response - behavior in which student is engaged	W - Writing G - Playing Academic Game RA - Reading Aloud RS - Silent Reading TA - Talking About Academics ANQ - Answers Academic Question ASK - Asks Academic Question AT - Passive Response RH - Raising Hand LM - Looking for Materials M - Moves to New Academic Station PA - Play Appropriate DI - Disruption PI - Play Inappropriate IT - Inappropriate Task TNA - Talking About Non-academics IL - Inappropriate Locale LA - Look Around SST - Self-Stimulation

[a] Based on Stanley & Greenwood's (1980) CISSAR: Code for instructional structure and student academic response. Observer's manual. Within the Student Response Event Area, the AT event, which was designated as "Attending" by Stanley and Greenwood, was renamed as "Passive Response" in the present investigation to avoid inappropriate connotations of the responses included within that event.

Table 2

Summary of Reliabilities Calculated During the Study[a]

Reliability	Mean	Range
Behavioral		
Teacher Position	92.5	69-100
Teacher Behavior	94.4	72-100
Student Response	89.0	60-100
Sequential	93.6	85-99

[a]All reliabilities are expressed as percentages.

Table 3

Examples of Observed Events with Large Time Variability Among Students[a]

Event	Range	Time Difference
Activity		
Reading	28.70 - 96.95	68.25
Math	0.00 - 67.20	67.20
Task		
Readers	4.55 -135.80	131.25
Workbooks	0.00 - 82.25	82.25
Other Media	11.20 - 88.20	77.00
Structure		
Entire Group	34.30 -201.95	167.65
Small Group	0.00 - 96.95	96.95
Individual	0.00 - 93.45	93.45
Teacher Position		
In Front	10.90 -104.90	94.00
At Desk	1.75 - 94.60	92.85
Among Students	10.15 -140.90	130.75
Beside Student	0.40 - 66.25	65.85
Teacher Activity		
No Response	52.35 -155.40	103.05
Teaching	23.85 - 92.75	68.90
Student Response		
Writing	11.00 - 50.75	39.75
Passive Response	26.50 -136.40	109.90
Play Inappropriate	0.25 - 25.15	24.90

[a]Entries are times in minutes per day

Table 4

Time Allocated to Activities for LD and Non-LD Students[a]

Activity	LD $\bar{X}$	LD %	Non-LD $\bar{X}$	Non-LD %	Sig. Level[b]
Reading	60.8	28.8	65.7	30.1	ns
Math	41.5	19.7	44.9	20.6	ns
Spelling	11.1	5.3	9.8	4.5	ns
Handwriting	7.8	3.7	9.6	4.4	ns
Language	29.8	14.1	25.9	11.9	ns
Science	11.4	5.4	11.2	5.1	ns
Social Studies	17.1	8.1	18.3	8.4	ns
Arts/Crafts	10.9	5.2	10.3	4.7	ns
Free Time	6.4	3.0	4.2	1.9	ns
Business Management	5.6	2.6	7.1	3.2	ns
Transition	8.4	4.0	10.9	5.0	ns
Can't Tell	0.2	0.1	0.1	0.0	ns
Total	211.0		218.0		ns

[a]Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 17 LD and 17 non-LD students.

[b]Significance levels are from independent t tests on the mean times over two days.

Table 5

Composite Activity Times for LD and Non-LD Students[a]

Activity Composite	LD $\bar{X}$	LD %	Non-LD $\bar{X}$	Non-LD %	Sig Level[b]
Academic	179.5	85.1	185.4	85.0	ns
Non-Academic	31.5	14.9	32.6	15.0	ns
Total	211.0		218.0		ns

[a]Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 17 students in each group.

[b]Significance levels are from independent t tests on the mean times over two days.

Table 6

Time Allocated to Tasks for LD and Non-LD Students[a]

Task	LD $\bar{X}$	LD %	Non-LD $\bar{X}$	Non-LD %	Sig Level[b]
Readers	57.7	27.4	76.5	35.2	ns
Workbooks	30.1	14.3	25.0	11.5	ns
Worksheets	27.4	13.0	29.9	13.8	ns
Paper & Pencil	22.2	10.5	22.0	10.1	ns
Listen to Lecture	3.6	1.7	4.5	2.1	ns
Other Media	46.0	21.8	31.5	14.5	.014
Teacher-Student Discussion	12.4	5.9	14.1	6.5	ns
Fetch & Put Away	11.4	5.4	13.8	6.4	ns
Total	210.8		217.3		ns

[a]Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 17 LD and Non-LD students.

[b]Significance levels are from independent t tests on the mean times over two days.

Table 7

Time Allocated to Class Structures for LD and Non-LD Students[a]

Structure	LD		Non-LD		Sig Level[b]
	$\bar{X}$	%	$\bar{X}$	%	
Entire Group	134.8	63.8	166.4	76.4	.031
Small Group	42.1	19.9	48.5	22.2	ns
Individual	34.4	16.3	3.0	1.4	.000
Total	211.3		217.9		ns

[a]Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 17 LD and 17 non-LD students.

[b]Significance levels are from independent t tests on the mean times over two days.

Table 8

Time in Various Teacher Positions for LD and Non-LD Students[a]

Teacher Position	LD $\bar{X}$	LD %	Non-LD $\bar{X}$	Non-LD %	Sig Level[b]
In Front	35.6	20.3	50.5	27.9	ns
At Desk	29.4	16.7	46.2	25.5	ns
Among Students	80.8	46.0	67.1	37.1	ns
Beside Student	19.8	11.3	2.6	1.4	.000
Back	5.5	3.1	8.1	4.5	ns
Out	4.6	2.6	6.5	3.6	ns
Total	175.7		181.0		ns

[a]Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 17 LD and 17 Non-LD students.

[b]Significance levels are from independent t tests on the mean times over two days.

Table 9

Time in Various Teacher Activities for LD and Non-LD Students[a]

Teacher Activity	LD $\bar{X}$	LD %	Non-LD $\bar{X}$	Non-LD %	Sig Level[b]
No Response	105.0	59.7	113.5	62.6	ns
Teaching	63.4	36.1	60.3	33.3	ns
Other Talk	5.6	3.2	6.4	3.5	ns
Approval	0.6	0.3	0.2	0.1	.003
Disapproval	1.2	0.7	0.8	0.4	ns
Total	175.8		181.2		ns

[a]Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 17 LD and 17 Non-LD students.

[b]Significance levels are from independent t tests on the mean times over two days.

Table 10

Student Response Time for LD and Non-LD Students[a]

Student Response	LD $\bar{X}$	LD %	Non-LD $\bar{X}$	Non-LD %	Sig Level[b]
Writing	22.4	12.8	30.1	16.6	.029
Play Acad Game	3.4	1.9	1.0	0.6	.041
Read Aloud	3.7	2.1	0.7	0.4	.007
Read Silently	8.4	4.8	12.8	7.1	ns
Talk Academics	5.6	3.2	2.0	1.1	.001
Answer Acad Question	2.1	1.2	0.7	0.4	.022
Ask Acad Question	1.1	0.6	0.4	0.2	.000
Passive Response	70.4	40.1	80.0	44.3	ns
Raise Hand	3.2	1.8	3.2	1.8	ns
Look for Materials	6.2	3.5	5.2	2.9	ns
Move To New Acad Station	5.2	3.0	5.7	3.2	ns
Play Appropriate	10.6	6.0	8.9	4.9	ns
Disruption	1.4	0.8	0.1	0.0	ns
Play Inappropriate	6.1	3.5	5.7	3.2	ns
Inappropriate Task	1.3	0.7	1.1	0.6	ns
Talk Non-Academics	6.3	3.6	6.1	3.4	ns
Inappropriate Locale	1.9	1.1	2.2	1.2	ns
Look Around	15.9	9.0	14.7	8.1	ns
Self Stimulation	0.3	0.2	0.1	0.0	ns
Total	175.5		180.7		ns

[a]Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 17 LD and 17 Non-LD students.

[b]Significance levels are from independent t tests on the mean times over two days.

Table 11

Composite Student Response Times for LD and Non-LD Students[a]

Student Response Composite	LD $\bar{X}$	LD %	Non-LD $\bar{X}$	Non-LD %	Sig Level[b]
Academic	46.7	26.6	47.7	26.4	ns
Task Management	95.6	54.5	103.0	57.0	ns
Inappropriate	33.2	18.9	30.0	16.6	ns
Total	175.5		180.7		ns

[a]Entries are mean numbers of minutes, and percentages of total minutes, for one day, based on 17 students in each group.

[b]Significance levels are from independent t tests on the mean times over two days.

Table 12

End-of-the-Year PIAT Standard Scores for LD and Non-LD Students

Subtest	LD[a]		Non-LD[b]	
	$\bar{X}$	SD	$\bar{X}$	SD
Mathematics	96.58	11.78	110.77	9.49
Reading Recognition	91.83	11.01	111.39	6.23
Reading Comprehension	93.00	13.24	110.08	10.52
Spelling	88.00	10.29	106.85	11.27
General Information	105.92	7.23	105.54	13.52
Total	95.09	7.66	109.15	8.20

[a]Test results were available for 12 LD students.

[b]Test results were available for 13 non-LD students.

Table 13

Significant Correlations Between PIAT and Academic Student Responses[a]

Academic Student Response	PIAT Subtest	Overall	LD	Non-LD
Acad Composite	Spelling	.44*	--	.79***
	Gen Infor	--	-.59*	--
Writing	Spelling	.54**	--	.48*
	Gen Infor	--	-.57*	--
Acad Game	Gen Infor	--	-.66**	--
Read Aloud	Read Comp	--	--	.59*
	Spelling	-.48**	--	--
	Total	-.34*	--	--
Read Silently	Read Recog	.58***	.68**	.68**
	Read Comp	.42*	--	--
	Spelling	.50**	--	--
	Gen Infor	.60***	--	.82***
	Total	.60***	--	.68**
Talk Acads	Math	--	-.54*	--
	Read Recog	-.63***	--	--
	Read Comp	-.62***	-.52*	--
	Spelling	-.51**	--	--
	Total	-.53**	--	--
Ask Acad Q	Math	-.46*	--	--
	Read Recog	-.54**	--	--
	Read Comp	-.48**	--	--
	Spelling	-.58***	--	--
	Gen Infor	--	.58*	--
	Total	-.42*	--	--

[a]Significance levels of correlations are designated as follows:
* $p < .05$
** $p < .01$
*** $p < .001$

Table 14

Significant Correlations Between PIAT and Task Management Student Responses[a]

Task Management Student Response	PIAT Subtest	Overall	LD	Non-LD
Raise Hand	Read Recog	--	--	-.68**
	Gen Infor	-.49**	--	--
Look for Materials	Math	--	--	.68**
	Read Recog	-.47**	-.66**	--
	Read Comp	-.51**	-.74**	--
	Total	-.37*	-.62*	--

[a]Significance levels of correlations are designated as follows:
* $p < .05$
** $p < .01$
*** $p < .001$

Table 15

Significant Correlations Between PIAT and Inappropriate Student Responses[a]

Inappropriate Student Response	PIAT Subtest	Overall	LD	Non-LD
Inappr Composite	Gen Infor	--	.52*	--
	Total	--	.74**	--
Disruption	Gen Infor	--	.60*	--
	Total	--	.56*	--
Play Inappr	Read Comp	.42*	--	.57*
	Gen Infor	--	.54*	--
Inappr Task	Math	-.42*	--	--
	Read Comp	--	--	.66**
	Spelling	-.42*	--	--
	Gen Infor	--	--	-.66**
Talk Non-Acad	Total	--	.60*	--
Inappr Locale	Math	-.36*	--	--
Look Around	Read Comp	--	--	-.54*
	Spelling	--	.58*	--
Self Stimulation	Math	-.36*	--	--
	Read Recog	--	.53*	--

[a]Significance levels of correlations are designated as follows:
* $p < .05$
** $p < .01$
*** $p < .001$

Table 16

Changes in PIAT Raw Scores Over One Year for Six LD Students

PIAT Subtest	$\bar{X}$	Range
Mathematics	+5.33	-3 - +18
Reading Recognition	+3.83	+1 - +10
Reading Comprehension	+4.00	-1 - +18
Spelling	+2.60	-4 - +11
General Information	+9.67	-2 - +17
Total	+17.40	+2 - +43

Table 17

Significant Correlations Between PIAT Raw Score Changes and Student Responses for Six LD Students[a]

Student Response	PIAT Subtest	Correlation
Academic		
Writing	Math	.82*
	Read Recog	.89**
Read Aloud	Math	.82*
	Read Recog	.89**
	Read Comp	.81*
Ans Acad Q	Spelling	.80*
Ask Acad Q	Math	-.93**
	Read Recog	-.85*
	Read Comp	-.85*
	Spelling	-.91**
Task Management		
Play Appropriate	Read Recog	.74*
	Read Comp	.81*
Inappropriate		
Inappr Locale	Math	-.72*
Look Around	Spelling	-.80*

[a]Significance levels of correlations are designated as follows:
* $p < .05$
** $p < .01$
*** $p < .001$

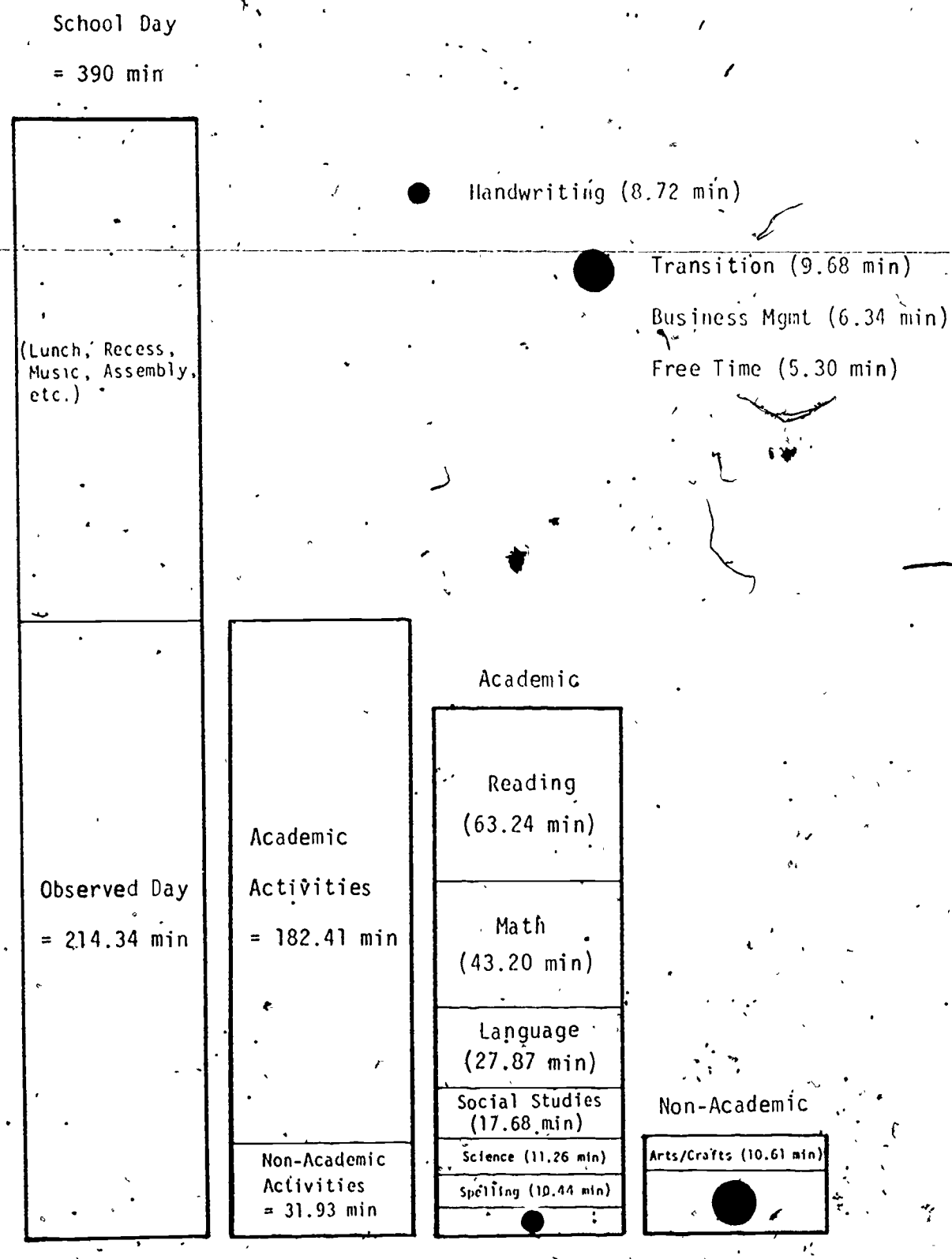

Figure 1. Average Times Allocated to Various Activities During a Typical School Day for LD and Non-LD Students.

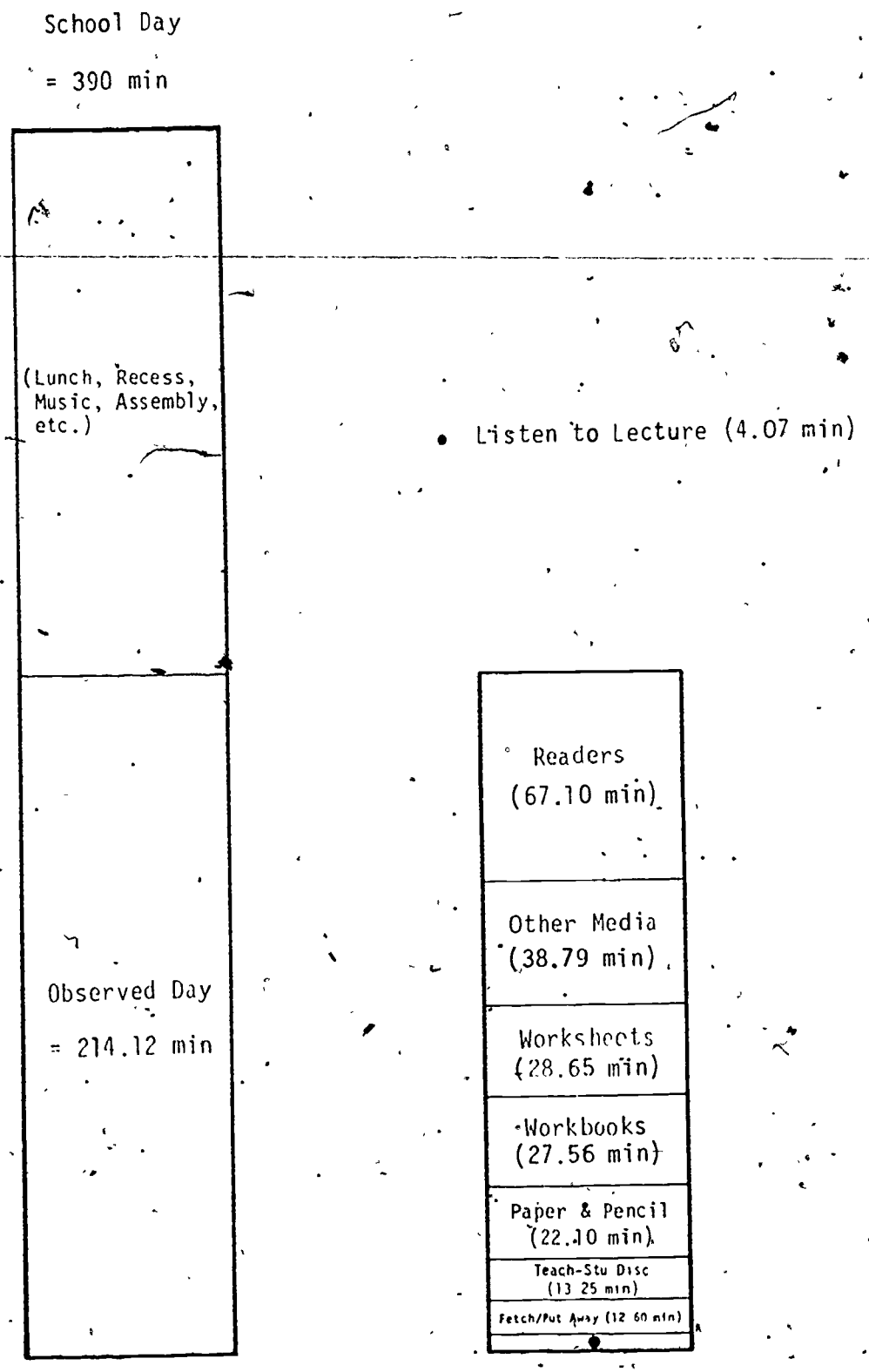

Figure 2. Average Times Allocated to Various Tasks During a Typical School Day for LD and Non-LD Students.

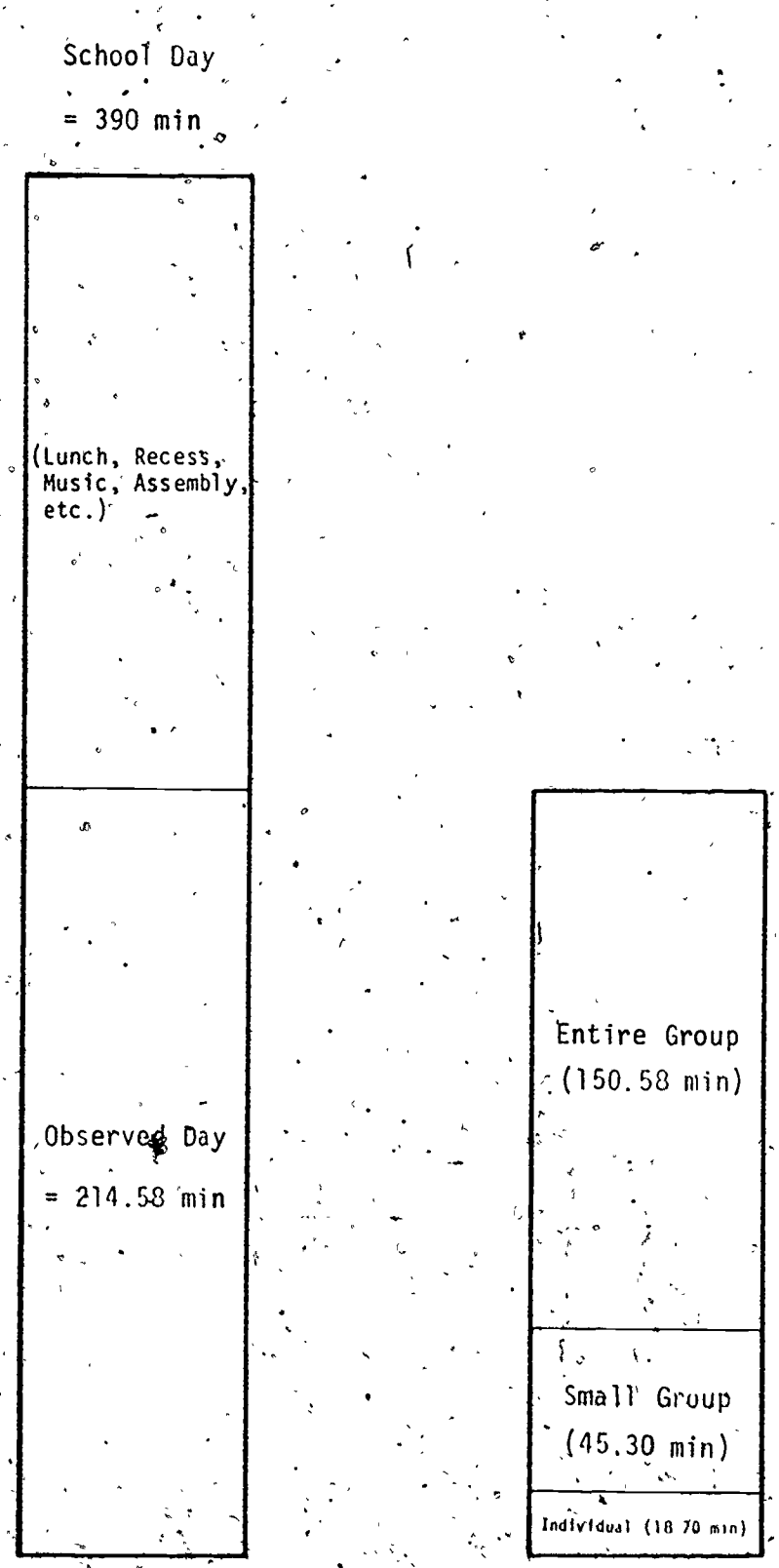

Figure 3. Average Times Allocated to Various Teaching Structures During a Typical School Day for LD and Non-LD Students.

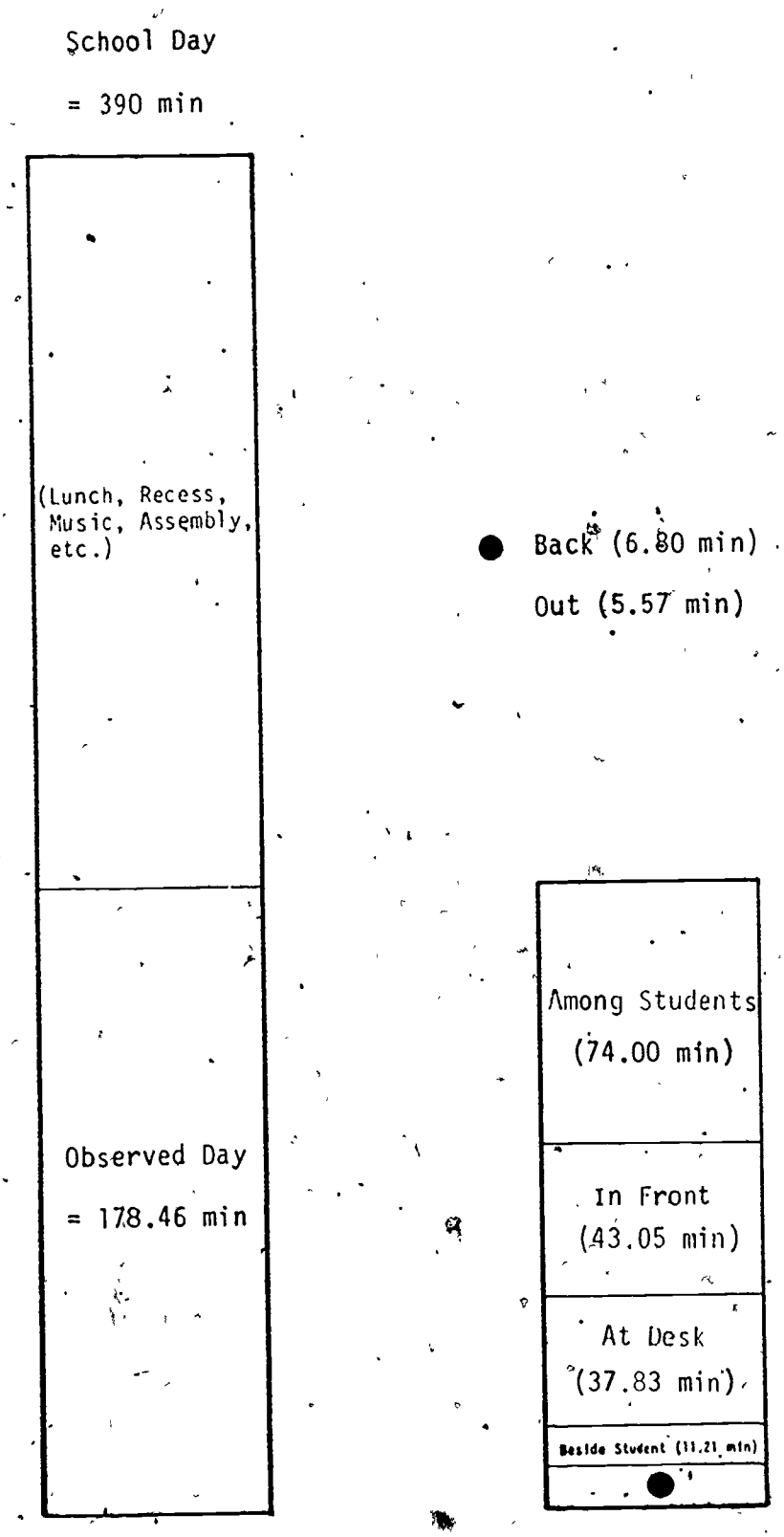

Figure 4. Average Times Allocated to Various Teacher Positions During a Typical School Day for LD and Non-LD Students.

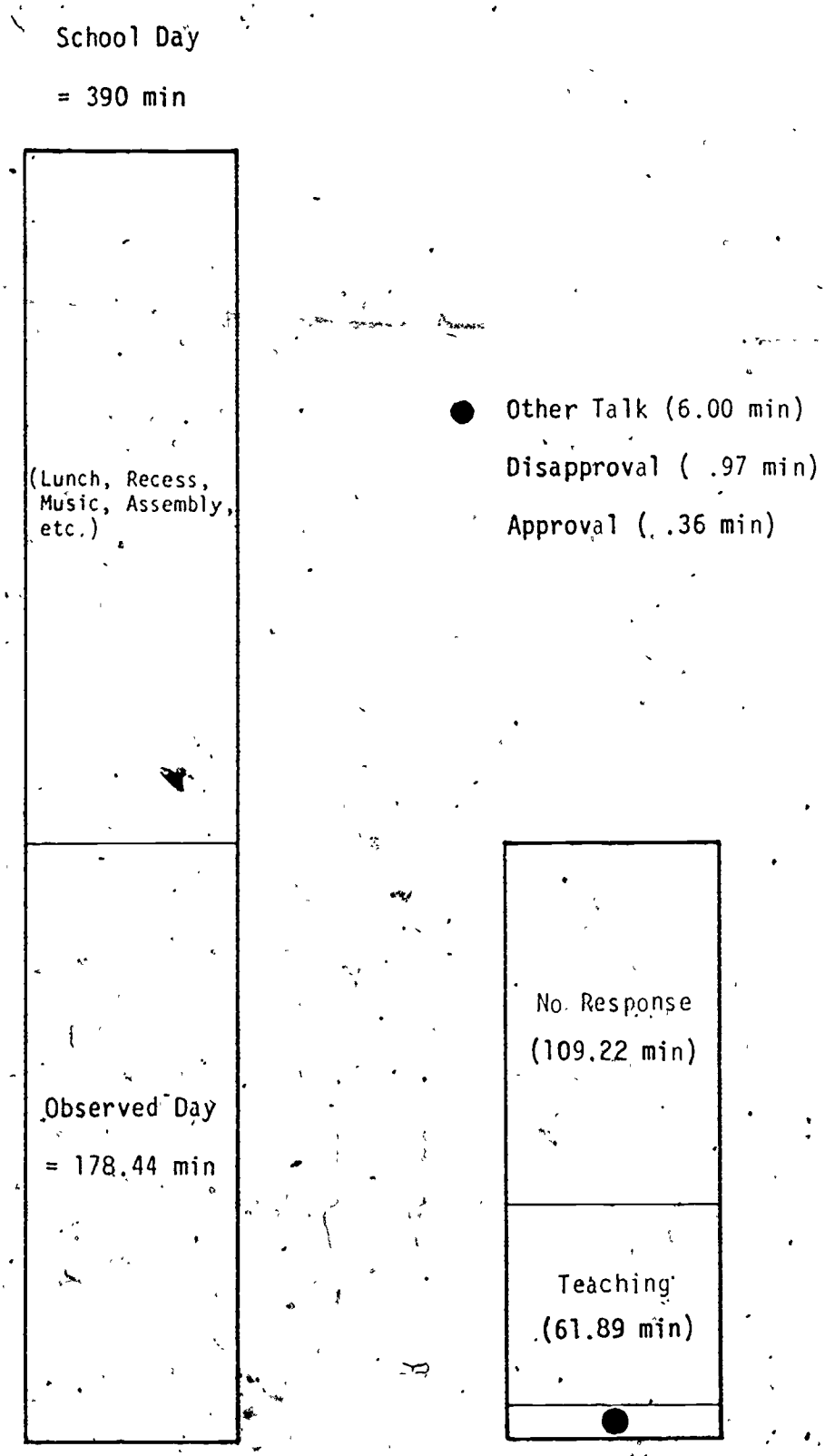

Figure 5. Average Times Allocated to Various Teacher Activities During a Typical School Day for LD and Non-LD Students.

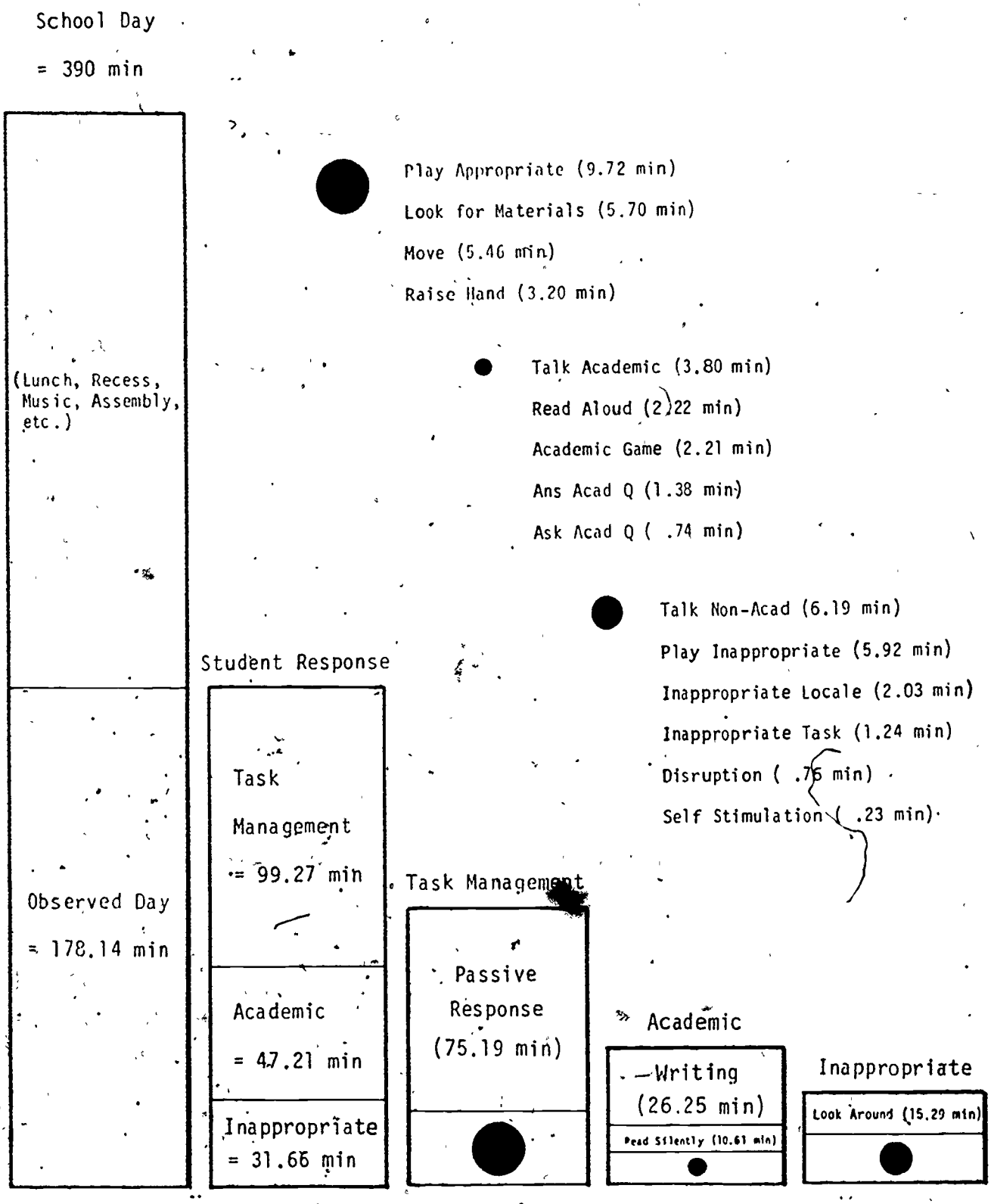

Figure 6. Average Times LD and Non-LD Students Were Engaged in Various Responses During a Typical School Day.

APPENDIX A

Definitions and Examples of CISSAR Events

Instructional Activity

(Subject area of learning experience being provided to target student by teacher, aide, or peer tutor or by target student to tutee.)

Note: Anytime the activity changes, move to a new coding block

Activity/Code	Definition	Examples	Special Notes
Reading (R)	Reading instructions or activity; oral and silent reading from books, discussion of words, sounds, vowels, consonants, phonics	reading library book talking about ch sound sitting at reading table draw picture about story	Include: • how to use dictionary, encyclopedia,...(reference books) • learning ABC's (but, not when learning how to write) • draw picture of what read; act out story
Math (M)	Math instructions or activity; numbers, geometry, time, weights, metrics, measurement, story problems	working time worksheet measuring each other's height writing math problem on board finds examples of "less than" find number of days in 2 years	
Spelling (S)	Spelling instruction or activity; copying spelling work, spelling test	taking spelling test playing spelling bee game looking up correct spelling of missed word	Include: • use of dictionary to find spelling of word
Handwriting (H)	Handwriting instruction or activity; focus on mechanics of writing letters or words (print, cursive, etc.); how to hold pencil, how to move arm, discussion of size of letters, lines on paper	practice penmanship matches capital and lower case letters	

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Instructional Activity - cont.

Activity	Definition	Examples	Special Notes
Language (L)	Language instruction or activity; focus on speech, vocabulary, and language meaning (words, physical relationships, etc.); creative writing; listening exercises; other languages	writing book report on story in reader points to "on top," "under," etc. learns how to say "thank you" in 5 languages	Include: • book reports (writing or reading) • looking up definition in dictionary • public speaking exercises
Science (Sc)	Science instruction or activity; science-related topics (chemistry, electricity, space travel, electronics, nature, insects, weather, mammals, body, exercise, personal hygiene)	discuss weather perform experimentation on electricity school nurse talks about hygiene reads Weekly Reader article about insects	Include: • watching or doing experiment • exercises in classroom • sex education (physical aspects-not relationships) • speakers on drugs/alcohol • science article in Weekly Reader
Social Studies (Ss)	Social studies instruction or activity; cultures, ways of life, jobs, roles; maps; music topics (instruments, singing, scales, notes)	talk about sex biases sing Thanksgiving songs label map of U.S. listen to lecture on Civil War	Include: • sex education - relationships in general • unit on friendships • special education topics - relations with handicapped • customs; holidays • history
Arts/Crafts (Ac)	Art-related instruction or activity; coloring, drawing, cutting, pasting	make poster of primary colors draw picture of self watch slides of sculptures	Include: • viewing art (own or others) • decorating (bulletin board, classroom) Within Ac time, putting away or getting new materials is still Ac; only change to Tn at beginning or end of Ac time.

Instructional Activity - cont.

Activity	Definition	Examples	Special Notes
Free Time (Ft)	Period during which student may choose activity - can be academic; study time	works math when told to do anything wants to do after student finishes assignment, is in library area reading	Include: • extra-credit work If everyone has free time, but target student is told what he/she must do, do not code Ft. Code the subject area which he is required to do.
Class Business/ Management (Bm)	Activity focused on scheduling, discipline, rules; usually occurs regularly at start of day; show and tell	picks up lunch tickets class talks about fight on playground during recess say "here" during attendance check	Include: • Pledge of Allegiance, morning songs • sex, relationships, drugs, etc. when related to specific problem in school • taking attendence
Transition (Tn)	Time between two other activities; teacher signals end of one (put away) and time to prepare for new activity. Ends when teacher starts instruction in new activity	class breaks into groups line up to go to recess put away readers and get out math books	For arts/crafts, Tn is coded only before and after entire activity
Can't Tell (CT)	Activities that do not seem to fit in other categories. See coordinator to discuss - must change to another code.		Make note of activity on separate sheet so will remember events to discuss with coordinator

Academic Task

(Materials used by target student for instructional activity)

Note: Any time the task changes, move to a new coding block

Task/Code	Definition	Examples	Special Notes
Readers (Rr)	Printed book, bound material	library book math textbook comic book	Include: • magazines, Weekly Reader • reference books (dictionary, encyclopedia)
Workbooks (Wb)	Paperback material in which student could write (even if student is required by teacher to write on separate paper or in notebook)	spelling workbook language workbook handwriting workbook	
Worksheets (Ws)	Separate prepared teacher sheets (usually ditto or photocopy) on which students write; blackboard writing by student	student practices letters on blackboard dittoed crossword puzzle	Include: • 1 page torn from workbook • writing Weekly Reader exercise • teacher made or printed tests
Paper and Pencil (Pp)	Tasks where student writes on paper using pencil, pen, crayon, etc.; includes writing in notebook	piece of notebook paper for spelling test	If students are taking notes during teacher lecture to remember points, code Ll
Listen to Teacher Lecture (Ll)	Teacher talking or writing on board, and student expected to look and listen	watches teacher demonstrate exercises listens to teacher talk about telling time takes notes as teacher presents ideas for field field trip	Code Ll even if student is taking notes

Academic Task - cont.

Task/Code	Definition	Examples	Special Notes
Other Media (Om)	Special materials; film, tape recorder, game, arts and crafts materials, clocks, telephone, play/drama	watches movie listens to tape recorder works on calculator acts out story part	Include: • calculator • animals
Teacher-student Discussion (Tsd)	Student talking with teacher; ask-answer question All other tasks take precedence	student answers teacher question students in class talk with teacher about friends student tutors another on ABC's. student reads book report to class	Include: • peer tutoring unless using other materials • student verbal presentations (including reading book report) All other tasks take precedence over Tsd. Take cue from teacher for change from Ll to Tsd.
Fetch/Put away (Fp)	Students changing materials-putting away and getting, cleaning up	line up for lunch picks up materials to throw away before completing art project student hands out worksheets	When student has absolutely no materials, and is not supposed to have any materials (such as when has free time), code Fp.

Structure

(How student is grouped for instructional activity)

Note: Any time the structure changes, move to a new coding block

Structure/Code	Definition	Examples	Special Notes
Entire Group (Eg)	Student receiving instruction with all other students in classroom	class lecture class freetime	For Eg, teaching (or free time is for <u>everyone</u>) Number is <u>not</u> the criterion - if class has 5 students and instruction is directed to all of them, code Eg
Small Group (Sg)	Student is in part of class that has been separated from rest	reading group discussion group students in pairs	Include: • two students working together away from rest of class
Individual (I)	Student is alone (in corral, at table) or working one-to-one with teacher or aide	student working on science experiment alone while other read from text aide tutors student	Does <u>not</u> occur during free time <u>except</u> when free time was created especially for student

Teacher Position

(Place of teacher in relation to all students)

Teacher Position/ Code	Definition	Examples	Special Notes
In Front/IF	in front of majority of students	- standing at blackboard - at front bulletin board	
At Desk/AD	standing or seated at teacher's desk	- looking in desk for notebook - at desk collecting lunch money	
Among Students/AS	standing or seated among students	- walking around class checking student work - seated with reading group	
Side/S	standing to the side of students and not AS	- student leaning over child's desk - talking to student at his desk	- working individually with a student
Back/B	standing or sitting in back of classroom away from majority of students	- working at isolated desk in back of room -putting up art pictures on back bulletin board	
Out of Room/O	out of the room	- in hall talking to parent - in teacher's lounge	

Teacher Activity

(Coded in relation to target student or group in which he is a member)

Teacher Behavior/ Code	Definition	Examples	Special Notes
No Response/NR	makes no observable response	- at desk grading papers - out of room	- working individually with another student
Teaching/T	instruction or giving a lesson to students child must have opportunity to learn	- explaining at blackboard - asking question - talking about academics, e.g. giving directions	- key is active involvement by teacher
Other Talk/OT	- talking about class business, rules, schedules, future activities - all teacher talk that is not approval, disapproval, or teaching	- talking about recess - talking about mother's hospital stay - collecting lunch money	
Approval/A	expresses praise for student work or conduct	- teacher hugs student - teacher smiles - "Your map looks great"	- includes verbal comments, gestures, physical behaviors
Disapproval/D	expresses dislike or disgust with student work, appearance or conduct	- frowns at student - that is the wrong answer - "You're not trying"	- includes verbal comments, gestures, and physical behaviors

Student Response

(Academic response, task management, or inappropriate behavior of target student)

Student Response/ Code	Definition	Examples	Special Notes
Academic Responses	student responses made to academic task		
Writing/W	students observed marking academic materials with pen, pencil, crayon	- erasing - marks answers on ditto sheet with crayon - completes math problems from workbook	- does not include drawing pictures, scribbling - used for tests
Academic Game/G	engaged with an academic media task played individually or with peer	- includes flashcards, word games, coloring, abacus - student responses are verbal, manipulatory or social in nature - 4 students are playing a spelling game	- includes calculator - flashcards when with a classmate or as a practice tool
Read Aloud/RA	when student looking at reading material and saying aloud what is written in print	- student reads a paragraph to rest of reading group -reads a sentence aloud to "sound out" unfamiliar words	- used when teacher checks student's knowledge of flashcard

Stucent Response continued

Student Response/ Code	Definition	Examples	Special Notes
Reading Silent/RS	looking at reading material for at least 2 seconds, and/or eye movements indicate scanning materials on desk (3' radius) or held in student's hands. Readers must be open to a page.	- student is reading directions in language workbook - student is scanning workbook for familiar words - student reads to self a set of numbers from math book	- reading words or numbers - not rapid flipping - only code when reading materials include several pages (not worksheet)
Talk About Academics/ TA	talk back and forth about academic materials or assignment	- student tells classmate answer to math question - student talks during show and tell - student recites a poem he's memorized	- child may be talking to himself or a peer - coded only when target student talking, not when listening - when reciting a poem or story from memory - student doing all work in limelight
Answer Academic Question/ANQ	student either verbally or gesturally responds to teacher's academic question	- student says "I don't know" to teacher's question - student spells a word for teacher	- answer may be correct or incorrect - answer should be almost immediate
Ask Academic Question/ Ask	verbally ask the teacher a question related to academics	"Is 3 + 4 = to 7?"	- must be an academic question: When is it time for lunch? is not ASK

Student Response continued

Student Response/ Code	Definition	Examples	Special Notes
Task Management	student behaviors which enable student to engage in academic task -- not direct responses to academic tasks		
Passive Response	student is looking at teacher for instructions; at blackboard for direction; or at another student asking or answering a question --- Key: looking at teacher or peer	- student looks at teacher while she lectures - student pages through math book to final assignment - teacher asks student to pass out ditto sheets to class	- coded for listener when two students are talking about academics - rapid flipping of pages - two students are playing a game; target student observing - reading (ect.) takes precedence
Raising Hand/RH	student's hand raised; may be accompanied by looking for teacher and if student raises hand in a request to answer teacher question	- teacher asks question and student raises hand to respond - student needs help with math so raises hand to alert teacher	- RH plus yelling equals DI (disruption)

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Student Response continued

Student Response/ Code	Definition	Examples	Special Notes
Look for Materials/ LM	student observed looking for or putting away materials; includes use of materials away from desk (e.g. answer sheets, reference books)	- student goes to teacher's desk for correction sheet - student returns dictionary to shelf - student looks for paper and pencil	- may include use of reference materials away from desk; look up word in dictionary sharpening pencil stapling
Moves to New Academic Station/M	student moves to new area as station for next activity; activity is in transition	- student moves to learning center during free time - students lining up for recess	- includes lining up and moving when in compliance with teacher request
Play Appropriate/PA	engaged in play behaviors approved by teacher may involve toys from home; may be strictly social	- students play musical chairs during party - students play Monopoly during free time	- code G if play becomes an academic game - code when student puts head on desk when told to or when has free time drawing, coloring drinking water, washing hands
Inappropriate behavior			
Disruption/DI	behaviors which are aggressive or produce loud noises: includes loud talk	- trips another student - shakes fist at other student - yells - poke another student	- DI takes precedence over inappropriate locale

Student Response continued

Student Response/ Code	Definition	Examples	Special Notes
Play Inappropriate/ PI	play not approved by teacher	- play involving squirt guns, toys hidden in desk - shoots rubber bands; paper airplanes	- includes scribbling or drawing at wrong times - code when student puts head on desk when is not supposed to
Inappropriate Task/ IT	engaged in task without teacher approval; not related to task assigned	- student colors to avoid math assignment - reads story during Social Studies	- avoidance of assigned task is key
Talk Non-Academic/ TNA	talks aloud to peer about non-academic materials not related to assignment	- students talk about after school plans - "What time is lunch?"	- can be directed to teacher or student - includes passing notes
Inappropriate Locale/ IL	child out of seat and away from instruction site looses contact with seat	- student goes to bathroom without permission - student becomes angry and leaves school - student stands on desk	
Look Around/LA	student looking away from academic task	- child looks out window - looks at floor then ceiling	- code AT if student looking at classmate and answering question
Self Stimulation/ SST	active behaviors of child like rapid rocking or shaking: maintained for 2 to 3 seconds	- student rocks back & forth - rapidly moves his pencil back and forth	- single major feature of child's behavior - academic responses take precedence over SST

APPENDIX B

Optical Scanner Coding Sheet

ID	PAGE	START 1	STOP 1	START 2	STOP 2	START 3	STOP 3	OBS #

DO NOT MARK HERE

Institute for Research
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CISSAR Coding Sheet

R M S H L S Sc Ac Ft Bm Tn Ct Br Wb Ws Pp Ll Om Tsd Fp Eg Sg I

																		Stop Code
IF	AD	AS	S	B	O	NR	T	OT	A	D	W G RA RS TA	ANQ	ASK	AT RH LM M PA	DI PI IT	TNA	IL LA SST	A B C D E F G H I J K L M N O P Q
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IF	AD	AS	S	B	O	NR	T	OT	A	D	W G RA RS TA	ANQ	ASK	AT RH LM M PA	DI PI IT	TNA	IL LA SST	START 1
IF	AD	AS	S	B	O	NR	T	OT	A	D	W G RA RS TA	ANQ	ASK	AT RH LM M PA	DI PI IT	TNA	IL LA SST	
IF	AD	AS	S	B	O	NR	T	OT	A	D	W G RA RS TA	ANQ	ASK	AT RH LM M PA	DI PI IT	TNA	IL LA SST	STOP 1
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R M S H L Sc Ss Ac Ft Bm Tn Ct Br Wb Ws Pp Ll Om Tsd Fp Eg Sg I

																		Stop Code
IF	AD	AS	S	B	O	NR	T	OT	A	D	W G RA RS TA	ANQ	ASK	AT RH LM M PA	DI PI IT	TNA	IL LA SST	A B C D E F G H I J K L M N O P Q
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IF	AD	AS	S	B	O	NR	T	OT	A	D	W G RA RS TA	ANQ	ASK	AT RH LM M PA	DI PI IT	TNA	IL LA SST	START 2
IF	AD	AS	S	B	O	NR	T	OT	A	D	W G RA RS TA	ANQ	ASK	AT RH LM M PA	DI PI IT	TNA	IL LA SST	
IF	AD	AS	S	B	O	NR	T	OT	A	D	W G RA RS TA	ANQ	ASK	AT RH LM M PA	DI PI IT	TNA	IL LA SST	STOP 2
IF	AD	AS	S	B	O	NR	T	OT	A	D	W G RA RS TA	ANQ	ASK	AT RH LM M PA	DI PI IT	TNA	IL LA SST	

R M S H L Sc Ss Ac Ft Bm Tn Ct Br Wb Ws Pp Ll Om Tsd Fp Eg Sg I

																		Stop Code
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IF	AD	AS	S	B	O	NR	T	OT	A	D	W G RA RS TA	ANQ	ASK	AT RH LM M PA	DI PI IT	TNA	IL LA SST	START 3
IF	AD	AS	S	B	O	NR	T	OT	A	D	W G RA RS TA	ANQ	ASK	AT RH LM M PA	DI PI IT	TNA	IL LA SST	
IF	AD	AS	S	B	O	NR	T	OT	A	D	W G RA RS TA	ANQ	ASK	AT RH LM M PA	DI PI IT	TNA	IL LA SST	STOP 3
IF	AD	AS	S	B	O	NR	T	OT	A	D	W G RA RS TA	ANQ	ASK	AT RH LM M PA	DI PI IT	TNA	IL LA SST	

APPENDIX C

Guidelines for Anecdotal Recordings

Observer Number _____

Observation Pages _____

Guidelines for Anecdotal Recordings

School # _____ Class # _____ Student # _____

Classroom Procedures (Note general class arrangement, schedule, and atmosphere. Anything unusual?)

Target Student (Comment briefly on each of the following areas for the target student observed.)

Location (where does the child sit in relation to where teacher does most teaching?)

Physical appearance (is child's appearance similar to peer group?)

Teacher-student relationship (are interactions between teacher and student similar to those of teacher with other students?)

Peer relationships (are interactions between target student and other students similar to those among most students in class?)

Attention to task (how does target student compare to other students?)

Other (is there anything about the target student that seems different from other students in the class?)

Validity of Observation (Is there any reason why you would believe that the observation is not a valid reflection of typical classroom activities, interactions, etc?)

APPENDIX D

Tables of Average Times and Ranges of Times

Table D-1

Average Times and Ranges of Times Allocated to Activities[a]

Activity	$\bar{X}$	Range
Reading	63.25	28.70 - 96.95
Math	43.20	0.00 - 67.20
Spelling	10.45	0.00 - 30.80
Handwriting	8.70	0.00 - 26.95
Language	27.85	2.80 - 63.00
Science	11.30	0.00 - 49.70
Social Studies	17.70	0.00 - 49.70
Arts/Crafts	10.60	0.00 - 35.00
Free Time	5.30	0.00 - 16.80
Business Management	6.35	0.70 - 15.75
Transition	9.65	1.05 - 22.05
Can't Tell	0.15	0.00 - 3.50
Total	214.50	154.70 -267.05

[a]Means and ranges are average numbers of minutes for one day, based on 34 students.

Table D-2

Average Times and Ranges of Times Allocated to Tasks[a]

Task	$\overline{X}$	Range
Readers	67.10	4.55 - 135.80
Workbooks	27.55	0.00 - 82.25
Worksheets	28.65	0.00 - 59.50
Paper & Pencil	22.10	0.00 - 51.45
Listen to Lecture	4.05	0.00 - 18.55
Other Media	38.75	11.20 - 88.20
Teacher-Student Discussion	13.25	1.05 - 30.80
Fetch & Put Away	12.60	1.75 - 30.80
Total	214.05	153.30 - 267.05

[a]Means and ranges are average numbers of minutes for one day, based on 34 students.

Table D-3

Average Times and Ranges of Times Allocated to Class Structures[a]

Structure	$\bar{X}$	Range
Entire Group	150.60	34.30 - 201.95
Small Group	45.30	0.00 - 96.95
Individual	18.70	0.00 - 93.45
Total	214.60	154.70 - 267.75

[a]Means and ranges are average numbers of minutes for one day, based on 34 students.

Table D-4

Average Times and Ranges of Times in Various Teacher Positions[a]

Teacher Position	$\bar{X}$	Range
In Front	43.05	10.90 - 104.90
At Desk	37.80	1.75 - 94.60
Among Students	73.95	10.15 - 140.90
Beside Student	11.20	0.40 - 66.25
Back	6.80	0.10 - 43.15
Out	5.55	0.25 - 32.35
Total	178.35	127.25 - 224.50

[a]Means and ranges are average numbers of minutes for one day, based on 34 students.

Table D-5

Average Times and Ranges of Times in Various Teacher Activities[a]

Teacher Activity	$\bar{X}$	Range
No Response	109.25	52.35 - 155.40
Teaching	61.85	23.85 - 92.75
Other Talk	6.00	1.40 - 21.25
Approval	0.40	0.00 - 1.40
Disapproval	1.00	0.15 - 3.00
Total	178.50	127.75 - 224.35

[a]Means and ranges are average numbers of minutes for one day, based on 34 students.

Table D-6

Average Times and Ranges of Times in Various Student Responses[a]

Student Response	$\overline{X}$	Range
Writing	26.25	11.00 - 50.75
Play Acad Game	2.20	0.00 - 16.40
Read Aloud	2.20	0.00 - 16.35
Read Silently	10.60	0.15 - 30.35
Talk Academics	3.80	0.85 - 12.10
Answer Acad Question	1.40	0.10 - 9.50
Ask Acad Question	0.75	0.00 - 1.65
Passive Response	75.20	26.50 - 136.40
Raise Hand	3.20	0.35 - 12.90
Look for Materials	5.70	1.40 - 15.10
Move to New Acad Station	5.45	1.00 - 10.90
Play Appropriate	9.75	0.15 - 27.50
Disruption	0.75	0.00 - 13.90
Play Inappropriate	5.90	0.25 - 25.15
Inappropriate Task	1.20	0.00 - 8.35
Talk Non-Academics	6.20	0.25 - 24.60
Inappropriate Locale	2.05	0.00 - 15.75
Look Around	15.30	4.50 - 25.85
Self Stimulation	0.20	0.00 - 1.15
Total	178.10	127.25 - 224.35

[a]Means and ranges are average numbers of minutes for one day, based on 34 students.

APPENDIX E

Additional Observation Findings

1. To what extent are there significant differences between groups in time spent in various student responses as a function of class activity?

   - Differences between groups were not significant.

2. To what extent are there significant differences between groups in time spent in various student responses as a function of different tasks employed?

   - While using readers, LD students spent more time reading aloud than non-LD students (about two and one-half minutes versus about 30 seconds) and spent more time in disruption (but only about five seconds).

   - While using readers, non-LD students spent more time writing than non-LD students (ten minutes versus 5 minutes and more time moving to a new academic station (one and one-half minutes versus less than one minute).

   - LD students spent more time talking about academics than non-LD students when the task was other media, workbooks, or worksheets (but less than two and one-half minutes per day were spent during each of these activities).

   - LD students were asked more academic questions than non-LD students while the task was other media, workbook, worksheet, or fetching and putting away materials (less than 20 seconds in each activity).

   - LD students answered more academic questions than non-LD students when the task was workbook, worksheet, paper and pencil, or teacher-student discussion (about 20 seconds or less in each activity).

   - LD students spent more time looking for materials during other media instruction (about one and one-half minutes) than non-LD students (about 40 seconds).

3. To what extent are there significant differences between groups in time spent in various student responses as a function of class structure?

   - During entire group instruction, non-LD students spent more time writing than LD students (23 minutes versus 14 minutes), reading silently (six minutes versus three and one-half minutes), and in exhibiting no active academic response (64 minutes versus 49 minutes).

   - During small group instruction, non-LD students spent more time than LD students raising their hand (about one minute versus about 15 seconds) and moving to a new academic station (about one and one-half minutes versus about 40 seconds).

- During small group instruction, LD students spent more time than non-LD students in reading aloud (one and one-half minutes versus 30 seconds) and in asking questions (less than one minute per day for both groups).

- When the class structure was individual instruction, LD students spent more time writing (four and one-half minutes), playing academic games (one minute), reading aloud (one and one-half minutes), talking about academics (two minutes), answering questions (one minute), asking questions (less than ten seconds), not engaged in an active academic response (nine minutes), playing appropriately (one and one-half minutes), playing inappropriately (30 seconds), looking around (one and one-half minutes), and self-stimulation (less than ten seconds).

4. To what extent are there significant differences between groups in time spent in various student responses as a function of teacher position?

   - While the teacher was instructing in front of the class, non-LD students spent more time than LD students in writing (about five minutes versus two and one-half minutes) and in not being engaged in an active academic response (27 minutes versus 18 minutes).

   - While the teacher was at her desk, non-LD students spent more time than LD students in writing (11 minutes versus four and one-half minutes), looking for materials (one and one-half minutes versus one minute), and moving to a new academic station (two minutes versus one minute).

   - While the teacher was among students or at the side of the individual student, LD students were higher than non-LD students in exhibiting no active academic response (eight minutes versus one and one-half minutes), LD students also were higher in the following types of responding: writing, playing academic games, reading aloud, talking about academics, answering and asking questions, looking for materials, looking around, being in the inappropriate locale, or engaging in self-stimulation. However, LD students spent less than three and one-half minutes in each of these activities.

5. To what extent are there significant differences between groups in time spent in various student responses as a function of teacher activity?

   - While the teacher was teaching, LD students spent more time than non-LD students reading aloud (one and one-half minutes versus about 15 seconds), talking about academics (three minutes versus about 30 seconds), answering questions (less than two minutes versus about 30 seconds), and asking questions (about 45 seconds versus about 15 seconds).

- While the teacher was talking about non-academics, LD students spent more time talking about non-academics (about 30 seconds versus about ten seconds).

- While the teacher was offering approval, LD students were more often engaged in play appropriate (only about one second) or were not actively engaged in academics (about 20 seconds).

- While the teacher was offering disapproval, LD students were more often engaged in talking about academics (only about three seconds) or in play inappropriate (only about six seconds).

- While the teacher was not exhibiting a teaching response toward the student, non-LD students spent more time writing (24 minutes versus 17 minutes).

- While the teacher was not exhibiting a teaching response toward the student, LD students spent more time reading aloud (about two minutes) and asking questions (less than 15 seconds).

6. To what extent are there significant differences between groups in time spent in various class structures as a function of class activity?

   - Non-LD students received more entire group in math instruction than LD students (43 minutes versus 26 minutes per day).

   - LD students received more individual instruction than non-LD students in reading (15 minutes versus about one minute), math (ten minutes versus less than one minute), language (three times versus less than 15 seconds), and in free time (less than two minutes versus almost zero).

7. To what extent are there significant differences between groups in time spent with the teacher in various teacher positions as a function of class activity?

   - For non-LD students, teachers spent more time teaching in front of the class during reading (15 minutes versus five minutes), and teachers were at their desk more during reading (ten minutes versus four minutes), math (13 minutes versus five minutes), and handwriting instruction (two minutes versus about 45 seconds).

   - For LD students, teachers spent more time at the side of the student during reading (eight minutes for LD and less than one minute for non-LD) and math (six minutes for LD and less than one minute for non-LD) and were among students more during free time (but less than two minutes per day).

8. To what extent are there significant differences between groups in time spent with the teacher in various teacher activities as a function of class activity?

   - Differences between groups were not significant.

9. To what extent are there significant differences between groups in time spent in different tasks as a function of class activity?

   - Differences between groups were not significant.

10. To what extent are there significant differences between groups in time spent in various class structures as a function of the different tasks employed?

    - Non-LD students received more entire group instruction with readers (about one hour per day) and worksheets (about 18 minutes per day) than LD students, who spent 42 minutes with readers and eight and one-half minutes with worksheets in the entire group.

    - LD students received more individual instruction with workbooks (about 5 minutes), worksheets (about ten minutes), and other media (about 11 and one-quarter minutes) than non-LD students, who averaged less than 30 seconds in these activities.

11. To what extent are there significant differences between groups in time spent with the teacher in various teacher positions as a function of the different tasks employed?

    - For non-LD students, teachers gave more instruction with readers while at their desk (18 minutes for non-LD, about nine minutes for LD), with worksheets while at their desk (six minutes for non-LD, two minutes for LD), and with worksheets while they were in front of the class (about six minutes for non-LD, two minutes for LD).

    - LD students received more instruction than non-LD students with workbooks (about three minutes versus less than ten seconds), worksheets (four minutes versus 20 seconds), paper and pencil (two minutes versus 20 seconds), and other media (e.g., flashcards) (six minutes versus about 30 seconds). with the teacher at their side.

12. To what extent are there significant differences between groups in time spent with the teacher involved in various teacher activities as a function of the different tasks employed?

    - Teachers engaged in more non-academic talk while using readers with non-LD students (less than one minute for non-LD versus 30 seconds for LD).

    - LD students received more approval than non-LD students during workbook and other media instruction (but less than ten seconds).

13. To what extent are there significant differences between groups in time spent with the teacher in various teacher positions as a function of the class structure?

    - Non-LD students received more small group instruction with the teacher in front of the class than LD students (nine minutes versus about two minutes).

    - LD students received more individual instruction with the teacher at her desk (about one and one-half minutes versus 20 seconds), among the class (ten minutes versus about 20 seconds), or at the side of the student (15 minutes versus about 30 seconds).

14. To what extent are there significant differences between groups in time spent with the teacher involved in various teacher activities as a function of the class structure?

    - Non-LD students spent more time than LD students in an entire group structure during which the teacher exhibited no teaching response to the student (one hour, 22 minutes versus one hour, 6 minutes).

    - LD students received more approval than non-LD students during small group instruction, although less than ten seconds.

    - During individual instruction, LD students received more teaching (ten minutes for LD, about 30 seconds for non-LD), approval (about 15 seconds), but also more time of no teacher response (16 minutes versus about one and one-half minutes).

15. To what extent are there significant differences between groups in time spent with the teacher involved in various teacher activities as a function of teacher position?

    - Teachers spent more time with LD than non-LD students at the side of an individual student and engaged in teaching (two minutes for LD, 20 seconds for non-LD), approval and disapproval (less than ten seconds), and in exhibiting no teaching response (40 seconds for LD, about five seconds for non-LD).

16. To what extent are there significant differences between groups in time spent with the teacher involved in various teacher activities as a function of the class activity while the student is making no active response?

    - During reading, while the student was not engaged in active academic responding, there were more instances of no teaching response to non-LD than LD children (ten minutes versus seven minutes).

- During transitions between activities, while the student was not engaged in active academic responding, teachers engaged in more non-academic talk with non-LD than LD children (two minutes versus one minute), and more disapproval with non-LD children (30 seconds versus six seconds).

- During reading and language instruction, when the student was not making an active academic response, LD students received more approval than non-LD students (but less than ten seconds).

17. To what extent are there significant differences between groups in time spent in various student responses as a function of the different tasks employed during reading?

    - Differences between groups were not significant.

18. To what extent are there significant differences between groups in time spent in various student responses as a function of the class structure during reading?

    - During entire group reading instruction, non-LD students spent more time than LD students in writing (about two minutes versus about 40 seconds), reading silently (three and one-half minutes versus less than one and one-half minutes), and being in an inappropriate locale (less than ten seconds).

    - During small group reading instruction, non-LD students spent more time not engaged in active academic responding (14 minutes versus eight minutes), raising their hands (less than one minute versus less than ten seconds), and moving to a new academic station (about one minute versus 25 seconds).

    - During small group reading instruction, LD students spent more time asking questions (less than 20 seconds).

    - During individual reading instruction, LD students spent more time than non-LD students in writing (less than two minutes versus less than 15 seconds), reading aloud (about one and one-half minutes versus zero minutes), talking about academics (25 seconds versus almost zero seconds), asking questions (less than ten seconds versus almost zero seconds), and not engaged in an active academic response (about three and one-half minutes versus about 25 seconds).

19. To what extent are there significant differences between groups in time spent in various student responses as a function of teacher activity during reading?

    - During reading instruction while the teacher was not exhibiting a teaching response toward the student, non-LD students were more often not engaged in active academic responding than LD students (ten minutes versus seven minutes).

- During reading instruction while the teacher was not exhibiting a teaching response toward the student, LD students were more often engaged in playing academic games (one minute for LD, zero for non-LD), reading aloud (two minutes for LD, 20 seconds for non-LD), or asking questions (less than ten seconds for LD, almost zero for non-LD).

- During reading instruction while the teacher was teaching, LD students were more often engaged in reading aloud (one and one-half minutes versus about ten seconds), talking about academics (about one minute versus about ten seconds), and asking questions (20 seconds versus less than five seconds).

- During reading instruction while the teacher was teaching, non-LD students were more often engaged in being in an inappropriate locale (but less than ten seconds).

- During reading instruction while the teacher was engaged in non-academic talk, LD students were more often engaged in non-academic talk (but less than 10 seconds).

- During reading instruction while the teacher was offering approval, LD students were more often not engaged in any active academic response (but less than ten seconds).

20. To what extent are there significant differences between groups in time spent with the teacher involved in various teacher activities as a function of the task employed during reading?

    - During reading instruction, LD students received more teacher approval while using workbooks (less than five seconds) and more teacher non-academic talk while using other media (e.g., flashcards) (less than 20 seconds).

    - During reading instruction, non-LD students received more instances of no teaching response during the activity of fetching and putting away materials (about 30 seconds versus about ten seconds).

21. To what extent are there significant differences between groups in time spent in different tasks as a function of class structure during reading?

    - During reading instruction, LD students used worksheets more than non-LD students during both entire group (about two minutes 50 seconds versus 19 seconds) and small group instruction (about three minutes 11 seconds versus no time).

22. To what extent are there significant differences between groups in academic responding, task management, and inappropriate behaviors as a function of whether the activity is academic or non-academic?

    - Differences between groups were not significant.

PUBLICATIONS

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University of Minnesota

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