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City University of New York PH.D. 1981

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THE COMPREHENSION OF HINTS BY NORMAL AND LEARNING DISABLED CHILDREN

by

TZIPORA K. MEIER

A dissertation submitted to the Graduate Faculty in Speech and Hearing Sciences in partial fulfillment of the requirments for the degree of Doctor of Philosophy, The City University of New York.

1981

This manuscript has been read and accepted for the Graduate Faculty in Speech and Hearing Sciences in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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Abstract

THE COMPREHENSION OF HINTS BY
NORMAL AND LEARNING DISABLED CHILDREN

by

Tzipora K. Meier

Adviser: Dean Norma Rees

This study investigated older children's comprehension of hints. Of particular interest were those hints which were not conventional, not explicit (omitting the actor, action and/or object of the directive) and which included humor or sarcasm. In addition, this study compared learning disabled children's comprehension of hints to that of normal children. Previous studies have presented contradictory conclusions regarding children's ability to use a "full range of directives" including hints (Ervin-Tripp, 1977; Anderson, 1978). There appear to be certain types of indirect directives and hints which a child of six cannot fully comprehend (Ackerman, 1978a). In addition, learning disabled children have been found to have deficits in linguistic abilities and difficulty interpreting communicative and social information (Vogel, 1974 ; Wiig and Semel, 1973;

Wallach, 1977; Klein-Konigsberg, 1977; Bryan, 1977; Israel, 1979). Many of the above studies have concluded that the learning disabled child functions linguistically as a younger normal child. In this study, it was hypothesized that younger children would perform poorer than older children in hint comprehension and that hints which were not explicit would be more difficult to comprehend. Learning disabled children's comprehension was hypothesized to be poorer than that of normal children of the same chronological age but similar to younger normal children.

Forty-eight normal children and thirty-six learning disabled children took part in this study. The normal subjects consisted of children at grades 1, 3, 5 and the learning disabled subjects consisted of children at grades 3, 5 and 7. The children were told stories (accompanied by pictures) which ended with a hint. The hint was at one of four levels of difficulty (HL I, HL II, HL III, HL IV). The children were then asked "What happened next?" The children's responses were recorded as correct or incorrect. Probe questions were asked to assess comprehension further.

The results indicated that the normal children performed significantly better than the learning disabled children and that the older children (ages 8,10,12) performed significantly better than the youngest children

(age 6) for the more difficult hints (HL III, HL IV). All of the subjects comprehended the easier hints (HL I and HL II). A significant difference was found between the ten year old normal and ten year old learning disabled children's performance at HL III, and between the twelve year old normal and twelve year old learning disabled children's performance at HL IV. In addition, different patterns of correct responses at the various hint levels were seen for the normal and learning disabled group as age increased.

Errors indicated a literal understanding of the hints and were classified according to directiveness. Error classes interacted with hint level, age and subject type.

The learning disabled children as well as the younger normal children generally did not include additional verbalizations in their responses nor did they verbally indicate an awareness of the hints. The learning disabled children displayed a high percentage of "non-directive" errors which was again similar to the error patterns of the younger normal children.

This study demonstrated that there are some hints which are difficult for normal six year olds and eight year olds to comprehend. In addition, learning disabled children perform poorer than normal children and in some instances, appear to function like younger normal

children. The skills necessary for hint comprehension include linguistic, cognitive and social abilities. Future research must determine which deficits result in poor hint comprehension and determine the ability of the learning disabled and normal children to use hints receptively and expressively in more natural settings, their ability to comprehend hints which are not indirect directives (i.e., compliments) and the ability of children younger than six and older than twelve to use these hints. The findings do suggest that the children who display difficulty comprehending these hints will have difficulty with other tasks which involve similar skills, e.g. reading comprehension.

Acknowledgements

To Dean Norma Rees, who has served as mentor and friend during my graduate years. Her wisdom, insights, and ongoing interest in this work provided the intellectual stimulation necessary for its completion. Her constant availability and patience, in spite of her many commitments, were truly appreciated. Her encouragement and sense of humor during the difficult times established the basis of a friendship which I will always value.

To Dr. Helen Cairns, whose guidance and constant involvement aided in the theoretical and pragmatic formulation of this study and the analysis of the results. Her tireless devotion to research and to her students was always evident. Her commitment to academic excellence presented me with the necessary challenges.

To Dr. Joel Stark, whose insights and perceptions about learning disabled children were invaluable. His awareness of the relevant issues and his understanding of the disordered population were always appreciated. His easy manner and friendly person were always welcome especially when he attempted to reduce the pain which so often accompanies endeavors such as this one. Thank you, Joel.

To the schools, their administrations, teachers, students and parents who willingly participated in the preliminary and actual study and responded with professionalism and warmth to my constant presence: The Frisch School, Paramus, New Jersey; The Moriah School, Englewood, New Jersey; Yavneh Academy, Paterson, New Jersey; The River Edge Elementary Schools, River Edge, New Jersey: Mr. Tim Hausdorf, Assistant Superintendent; The Dumont Public Schools: Dr. D. Dervitz, Superintendent of Schools and Dr. G. Hauser, Superintendent of Special Services; and The Community School of Englewood, Englewood, New Jersey: Mr. Abner Strauss, Assistant Principal.

To the many friends whose cooperation, support and encouragement made this work possible: Lila Korn, the photographer; the Weisbrot, Danto, Korn and Katz families who tirelessly posed for the photographs used; the Novogroders, for their "isolation room"; Tzivia Bieler, who faithfully and in good humor typed the many revisions; Evelyn Pollack and Jane Carp, for always listening to my hopes,complaints and theories.

To Menahem,who is ultimately most responsible for this accomplishment. His faith in me never faltered. His constant reminders of my self-imposed time limits, while irritating, proved to be an invaluable source of motivation. His respect for scholarship and honesty provided me with a model to emulate. His love has

resulted in an enriching and loving relationship which I cherish.

To Avigail and Elisheva, who are still too young to understand. Nevertheless, they ultimately "got the hint" that "mommy has to work now." Their joys, curiosity, excitement and constant talking resulted in a noisy, loving and warm environment in which all flourished.

Dedicated to my father

HaRav Tzvi Dov Kanotopsky (zt"l)

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CHAPTER 1

INDIRECT DIRECTIVES, HINTS AND THE PROBLEM

Introduction

An indirect directive refers to a directive or request which has been issued indirectly. In this form of directive, the literal meaning of the surface form of the utterance does not appear to match the meaning which the speaker wants to convey to the listener. For example, the speaker may use a question form and yet not be seeking the answer to the question. In the case of the utterance "Can you open the door?" the syntactic structure of the utterance is a yes/no question and the utterance functions that way in certain circumstances. If the listener has broken his arm and is having difficulty accomplishing everyday tasks, the speaker might want to know if the listener has the ability to open the door and hence desires a yes/no response. In contrast, if the room is hot and the speaker addresses a listener who is standing near the door, the utterance may function as a request that the listener open the door. The same utterance will be used and understood differently by speaker/listener therefore depending upon the situation and context. The speaker's intended meaning will be understood by the listener only if pragmatic considerations of context and language use are applied.

The above example of an indirect directive illustrates the fact that the surface form of a given utterance may not correspond to the speaker's intended meaning. This lack of correspondence is further emphasized by the observation that a particular meaning can be communicated in a variety of ways with a variety of sentence types. For example, a request for salt may take any one of a number of forms: "Can you pass the salt?" (indirect), "I see the salt" (indirect), "Where is the salt?" (indirect), "Give me the salt" (direct), "This is tasteless" (indirect), etc. Moreover, a particular utterance can be used in different contexts to convey different meanings as in the example: "Can you open the door?" A speaker can mean something other than that given by the literal interpretation of his utterance.

The indirect directive has been studied in great detail in an attempt to present a theoretical model explaining how the listener comprehends the speaker's intended meaning when this meaning has not been directly stated (Searle, 1969, 1975a, 1975b; Gordon and Lakoff, 1975; Green, 1975; Clark and Lucy, 1975; Clark, 1979; Clark and Schunk, 1980). Searle (1975a), for example, suggests that a fairly extensive linguistic analysis on the part of the listener is necessary for the comprehension of indirect directives. And yet, Searle (1975b) states that generally the listener may be able to bypass

the linguistic analysis since he immediately hears the utterance in terms of its intended meaning. (See Chapter 2 for further discussion of Searle's approach.) This routine quality of many indirect directives has prompted Ervin-Tripp (1977) to suggest that these utterances have lost their indirectness. Indeed, there appear to be different levels of indirectness. "Can you pass the salt?" seems to be more routine and less indirect than "This is tasteless" (as a request for salt). Ervin-Tripp lists directives according to the direct/indirect dimension (from most to least direct):

1. Personal need/desire statements: e.g., "I need a match."

2. Imperatives: e.g., "Give me a match."

3. Imbedded imperatives: e.g., "Could you give me a match?" In this form, the actor, verb and object of the desired act are all stated.

4. Permission directives: e.g., "May I have a match?"

5. Question directives: e.g., "Have you got a match?" As opposed to imbedded imperatives, the question directives do not state the act and often the actor of the desired act.

6. Hints: "The matches are all gone." The listener generally must use inferences to comprehend these directive types.

(Ervin-Tripp, 1977, p. 166)

Ervin-Tripp quotes a rule regarding non-imperative

directives as follows:

> Any declarative or interrogative is to be interpreted as a command to do if it (a) does not specify an agent, (b) is directed to a subordinate, (c) refers to an action or activity within the obligation of the addressee. Examples include: "This analysis has to be done over," "It's time to take a nap". (Ervin-Tripp, 1977, p. 169)

Ervin-Tripp supplements the above rule with the following:

> Those utterances will be interpreted as directives which break topical continuity in discourse, and which refer to acts prohibited to or obligatory for addressees, mention referents central to such acts, or give exemplars of the core arguments of understood social rules. Examples would be "somebody's talking," "I see chewing gum," etc. (Ervin-Tripp, 1977, p. 169)

Certain indirect directives are routinely used in certain situations ("Have you got the time?") and others have standard frames so they are quickly understood as directives ("Could you pass the salt?"). In the case of hints, inference from the literal meaning is required. Hints are the most obscure indirect directives, according to Ervin-Tripp (1977).

Why are indirect directives used? Searle (1975a) asserts that they serve to communicate politeness. Davison (1975) proposes their use when the speaker sees a potential conflict between his desires and the hearer's reaction. Indirectness is a means to separate oneself from conflict. Indirect utterances are used when subordinates address superiors,when a task is special or a situation is awk-

ward, when there is a physical distance between the speaker and the listener, when compliance is uncertain, when speaking to superiors, or as a means of humor or solidarity (Ervin-Tripp, 1977).

The Problem:

This study investigated older children's comprehension of hints. Of particular interest were those hints which were not conventional, not explicit (omitting the actor, action and/or object) and which included humor or sarcasm. In addition, this study compared learning disabled children's comprehension of hints to that of normal children.

The studies on children's use of indirect directives and hints have generally concentrated on the child under six years of age. In these investigations, there appears to be a lack of agreement regarding the child's ability to use indirect directives. Some have concluded that by age four children are using all kinds of directives (Anderson, 1978) while others have stated that at age six or seven children will use a full range of directives (Ervin-Tripp, 1977; Mitchell-Kernan and Kernan, 1977). In light of this disagreement, Ackerman's (1978a) finding that first graders did not perform as well as third graders on a compehension task of unconventionalized indirect directives is of interest, as is Leonard, Wilcox, Fulmer, and Dans's (1978) finding that four

and five year old children encountered difficulty with certain indirect directive frames. The discrepancy in the literature may stem from the differences in criteria used by the researchers when defining a "full range" of directives. Ackerman (1978a) and Leonard et. al. (1978) appear to go beyond Ervin-Tripp's (1977) "routinized hints and conventional directives." Their results suggest that Anderson's (1978) conclusion regarding the four year old's ability to use all kinds of directives may be too simplistic. While a child of four to six years of age may in fact use many types of indirect directives, there may be other types of indirect directives and hints which a child of that age cannot use.

There is little systematic information regarding children's use of hints. The studies reporting on children's expressive use of hints (Mitchell-Kernan and Kernan, 1977; Anderson, 1978) do not differentiate between hints in which the goal is mentioned and those in which it is not or between hints with and without humor or sarcasm. And, while some of the hints reportedly used by children are less explicit (Ervin-Tripp, 1977; Mitchell-Kernan and Kernan, 1977), there is little or no systematic information about the age of the children in these reports except that the children are six years of age and older. Ackerman's (1978a) study comes closest to a study of the comprehension of hints. The unconventional indirect directives that were used in his study are, in fact, hints. However, there has been no attempt to study

hints of varying difficulty. Furthermore, the children in Ackerman's study were presented with alternative responses to choose from rather than just the open-ended question, "What happened next?". It is possible that by using that procedure, Ackerman presented the children with choices which they would not have spontaneously offered as responses.

Indirect directives and hints in child language:

Several issues regarding children's use of indirect directives have been treated in research on this topic. They include: (a) the classification of directive forms used by children (Ervin-Tripp, 1977; Mitchell-Kernan and Kernan, 1977; Anderson, 1978), (b) children's comprehension of varying directive frames (Leonard, et. al., 1978), (c)the child's ability to extract social information from directives (Bates, 1976a, 1976b; Ervin-Tripp, 1977; Reeder, 1980), and (d) children's comprehension of non-routinized indirect directives (Ackerman, 1978). The framework for this work has been information on adult directives. Ervin-Tripp (1977) notes, however, some of the basic differences between the two populations. First one cannot expect to find the same structural complexity in the young child's directives as one finds in adult speech. Second, directives that are somewhat oblique and require the use of inference are used by adults purposively. While utterances used by children

may look like these oblique directives, they may be the result of the child's inability to specify exactly what he wants rather than the result of hinting (Ervin-Tripp, 1977).

The present study is concerned with children's comprehension of hints. The literature on children's comprehension of indirect directives and hints is small. Therefore, in order to provide a more detailed framework for this study, the literature on children's production of indirect directives and hints is also presented.

The general findings are that children do have a wide variety of request types available to them, although the more oblique directive types, especially those in which the goal is not mentioned, are not used until the child is older (over six years of age).

Production

Before the age of two, children issue directives by means of gestures, changes in intonation, desire statements ("I want . . ."), goal statements, ("more juice"), possession statements ("that's mine"), imperatives ("gimme . . ."), and problem statements ("Carol hungry.") (Ervin-Tripp, 1977). Some of these devices appear to be indirect, e.g., possession, problem, and need statements. In fact, Garvey (1975) classifies "need" and "want" statements in the category of "inferred requests", when used by children at ages three to five.

The assumption is that "they leave the H [hearer] the task of inferring that he is expected to perform a suitable action" (Garvey, 1975, p. 60). However, as noted above, these utterances may reflect the younger child's limitations and may be only the result of this child's inability to be more specific.

By the end of the second year and into the third year, more reliable indirect directives appear. The following utterance types have been noted in child speech between the ages of three and four.

1) Routines: Questions such as "Where is the truck?" (used as a directive - "Give me the truck.") are used by children in the third year. These were sometimes accompanied by searching by the speaker, so the directive nature of the utterance is unclear.

2) Imbeddings: Utterances such as "Would you . . .", "Could you . . .", etc. were used during the third year. Garvey (1975), studying children dyads (ages 3:6 - 5:7) noted that these request forms were used more often by the older children.

3) Hints: By age four, there are some reports of hints. The hints all contain the object or goal and the hints are used with familiar people. Some of the hints are only used in addition to and together with direct directives (Garvey, 1975). Many of the hints mention a situation the child wants changed, e.g., "He made sand go in my eyes."

4) Oblique strategies: These utterances are often part of a communication "strategy" taking several conversational

turns until the desired object is mentioned. For example:

A: Pretend this was my car.
B: No!

A: Pretend this was our car.
B: All right.

A: Can I drive our car?
B: Yes. (Garvey, 1975)

5) Omission of desired goal: It is only by the age of five or six that the desired goal/object is ommitted entirely.

For example:

"It's hot out here" (request for a rest stop). (Mitchell-Kernan and Kernan, 1977, p. 198)

(Ervin-Tripp, 1977)

Anderson's (1978) classification of children's utterances during role-playing is very similar to that of Ervin-Tripp (1977). The directive types used by the children (age 4:1 - 7:1) were:

	Example
1) Hints	"It's time for your nap."
2) Need/want statements	"I want that."
3) Imperatives	"Go away."
4) Let's imperatives	"Let's push it."
5) You imperatives	"You go."
6) Request	"Could you do it?"

(Anderson, 1978)

The children changed the directive type depending on the listener and depending on the social situation.

For example, children role-playing as parents used more hints and children role-playing as children used more "need" statements. If the speakers were unable to elicit the desired response, they changed their utterances and issued more direct directives. Anderson (1978) found clear differences between the age groups in their proportionate use of the directive types, given the particular role they played. Thus the youngest children used imperatives 41% of the time when in the role of child talking to mother while the oldest children used imperatives only 9% of the time when in the same role. At the same time, Anderson noted that even the youngest children (age four) were able to use the "full range of directives" (Anderson, 1978). Anderson, however, does not distinguish between hints or directives that mention the goal and those that do not mention the goal.

The seven year old child appears to have the ability to use the same range and same types of directives that the older twelve year old uses (Mitchell-Kernan and Kernan, 1977). The directives used by these groups range from simple commands to hints that do not mention the desired goal and that necessitate inferences, e.g., "We don't hear nothing" as a request for applause. The particular choice of directive was influenced by such factors as the role the child assumed, the social situation, and the listener.

Comprehension

Young children (age two) have been found to respond to indirect directives with action (Shatz, 1974). The directive "Can you + action" was presented in two linguistic contexts: with a set of directives (Pick up the ball, . . . Can you shut the door?) and with a set of informational questions (Can mommy talk on the telephone? . . . Can you shut the door?). While the children responded to the target utterance with action more often when the target utterance was within the directive set, they also responded almost 50% of the time with action responses when the target utterance was in the informational set. The interpretation of these findings is that children act when an action is mentioned and when action is feasable (Shatz, 1974). This suggests that children of this age do not comprehend indirect directives as adults do.

Reeder (1980) studied the ability of children (ages 2:6 - 3:0) to judge illocutionary forces (or intended meanings) of utterances. A target utterance such as "Would you like to play with the toy?" was presented in two contexts. One context presented cues suggesting that the illocutionary force of the utterance was request (I want you to play with the toy.) and the other context presented cues suggesting that the illocutionary force of the utterance was offer (I'll let you play with the

toy.). After the presentation of the target utterance within the specific context, the children heard two paraphrases of the target utterance representing the two possible intended meanings. For example, the children heard "I'll let you play with the toy," and "I want you to play with the toy." The children were asked to choose the paraphrase which was the same as the target utterance. While both two and a half and three year olds performed equally well in discriminating the "offers", three year olds performed significantly better than two and a half year olds in the comprehension of requests. Dore (1977) reports that three year olds responded to "why don't you" questions with an action response or with no response rather than with an information response. This suggests that the three year olds comprehended "why don't you" questions as directives. In addition, Dore presents several examples of children's responses which appear to be strange unless the questions which preceeded the responses were interpreted by the children as directives:

Q. John are you finished?

A. They're out cause I'm sorting them.

(Dore, 1977, p. 160)

Presumably, the question is interpreted as a directive to put away the blocks and the child's response is

"a reason for non-compliance" (Dore, 1977). Ervin-Tripp (1977) predicts that young children will comprehend imperatives, imbedded imperatives, need statements, and permission statements all of which she considers explicit. She takes issue with the assumption that imbedded imperatives are more difficult to comprehend since that assumption is based on the hypothesis that a full linguistic analysis of these utterances must precede comprehension. Rather, she assumes, as mentioned above, that many of these utterances are conventional and have lost their indirectness (Ervin-Tripp, 1977). Yet, Leonard et. al. (1978) has shown that there is a group of indirect directives which are more difficult for children (ages four, five, and six) and which are not conventional or explicit. Leonard studied children's comprehension of three indirect directives: (a) affirmative indirect directives ("Can you . . ."), (b) indirect directives with negative syntactic structure but positive intent ("Can't you . . ."), and (c) indirect directives with positive syntactic construction and negative intent ("Must you . . ."). The affirmative constructions and the negative syntactic/positive intent constructions were equally easy for four, five, and six year olds to comprehend. However, only the six year olds succeeded with the positive syntactic/negative intent constructions.

Question directives ("Is there any coffee?") and hints ("There's no coffee in this pot.") which are less explicit require the use of inference or repeated pairing with more explicit directives for comprehension.

An interesting finding is the variation in acquisition of these forms. Some children (age four) will comprehend the intent of an indirect directive which is routine for an adult, e.g.,. "Is your Daddy there?" Yet, other children (age ten) do not understand the intended meaning of this utterance (Ervin-Tripp, 1977).

Finally, Ackerman (1978a) found that first and third grade children interpreted unconventional indirect directives according to the context in which they were found. In Ackerman's study , the unconventional indirect directive was not routine and could be equally interpreted as a directive or a statement depending on the context. For example, the target utterance "Billy, I'm going to do my homework now" would be perceived as a statement when placed in a "literal context" (Billy keeps asking his brother when he will do his homework and this is the brother's response) and would be perceived as a directive when placed in an "extraliteral context" (Billy has turned the T.V. on very loud and his brother is requesting that he lower it). After the children were presented with the target utterance in a literal or extraliteral context, they were asked "What happened

next" and were given three possibilities from which to choose their response. Analysis of the data revealed that the first graders' responses were only marginally context sensitive to the "extraliteral" interpretations. (This latter finding may have resulted from the fact that the younger children often responded affirmatively to more than one choice.) The third graders' performance was similar to that of the adults. Both third graders and adults made "literal" and "extraliteral" interpretations dependent on context. The third graders, however, made more "extraliteral" interpretations than literal interpretations while adults responded with an equal number of each type of interpretation. Ackerman (1978a) suggests that third graders are "biased in an action direction" and he recalls Shatz's (1974) similar findings with two year olds.

The Learning Disabled Population

A specific learning disability has been defined as follows:

> A disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell or do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. The term does not include learning problems which are primarily the result of visual, hearing, or motor handicaps, of mental retardation,

> or of environmental, cultural or economic disadvantage. (Education of the Handicapped Act, 1975 - PL 94-142)

This definition is behavioral and does not stress etiology as did earlier definitions. Bryan and Bryan (1978) note that an earlier definition of the learning disabled child described such a child as one of average intelligence who displayed certain learning disabilities associated with deviation of the central nervous system. Various theoretical frameworks were presented to further clarify the bases of learning disabilities. Johnson and Myklebust (1967) suggested that the neurological dysfunction in these children affected the auditory and visual processes needed for learning. The perceptual/motor theory of learning disabilities hypothesized that the learning disabled child had "not assimilated critical experiences related to time, space and movement" (Kephart, 1967). The child had poor perceptions. The emphasis was on perceptual/motor skills while ignoring any language related skills (Kephart, 1963; Frostig, 1964; Barsh, 1967). A psycholinguistic framework was presented by Kirk and Kirk (1971) consisting of two channels of communication (auditory/vocal and visual/motor), three psycholinguistic processes (receptive, organizing, expressive), and two organizational levels (representational and automatic).

These theoretical explanations are alike in tracing

learning disabled child's difficulties to difficulties in auditory or visual processing or both. Since visual and auditory perceptual skills were considered basic to the acquisition of reading, remediation techniques were devised stressing perceptual-motor training. The effectiveness of perceptual-motor training was cast in doubt when some researchers found no difference in reading ability between children who had received perceptual-motor training and those who had not (Bryan and Bryan, 1978). Visual perceptual training did not result in reading improvement (Hammill, 1972); rather, reading training resulted in gains in reading skills (Bryan and Bryan, 1978). Furthermore, it was noted that some children with severe problems of perception, spatial orientation and coordination were not "dyslexic" (Larsen and Hammill, 1975). Even if perceptual-motor training did benefit some children, there was no way to predict who these children were (Bryan and Bryan, 1978). The assumption that auditory/visual processing skills are the basis of language learning disorders has been challenged (Rees, 1973b; Vellutino, 1979). Theorists now suggest that reading is a language based skill and that difficulties in learning to read can be traced to difficulties in language (Mattingly, 1972; Rees, 1973b; Stark, 1975; Wallach and Goldsmith, 1977). This theoretical approach has resulted in new studies

of the learning disabled population emphasizing the language skills of this population. The American Speech-Language-Hearing Association's Position Statement on learning disabilities (1980) stresses the importance of applying the findings of recent literature in language and reading to the learning disabled population. One of the implications for research, according to the task force, is "the investigation of the similarities and differences in the acquisition and development of language by children with normal and impaired communication" (ASHA Committee on Language Learning Disabilities, 1980, p. 634). Some studies, comparing normal and learning disabled children on language tasks, have found no difference between the two groups. Bryan and Bryan (1978) note, however, that these findings may have resulted from simple tasks which did not make the necessary demands on the child's skills.

The findings of many studies have led researchers to conclude that the learning disabled child does differ from the normal child in terms of his linguistic abilities. In a storytelling task, second graders who were poor readers were less fluent and used different sentence types than good readers. The poor readers used "existence" sentence types ("There's a dog/") more often than normal readers. In addition, the poorer readers used subordinate clauses in the subject position of the sentence rather

than in the predicate position of the sentence as normals did (Fry, Johnson, and Muehl, 1970). The "dyslexic" child was found to have difficulty detecting whether a sentence was a statement or a question. These children were less competent than the normal children in knowledge of morphological rules and in syntactic ability (Vogel, 1974).

Learning disabled adolescents were found to have deficits in "logico-grammatical" sentence comprehension (Wiig and Semel, 1973). The children were presented with sentences containing five types of linguistic concepts: comparison relationships, passive constructions, spatial relationships, familial relationships and temporal relationships between sequential events. The learning disabled children made more errors than the normal children. In addition, qualitative differences were found in the hierarchy of difficulty for the two groups. The learning disabled population performed most poorly on sentences containing concepts of familial relationships, spatial relations and sequential events. The normal population performed most poorly on temporal relations, spatial relations and passive constructs. In a later study (Wiig and Semel, 1974), the same materials were used with normal children in grades 1 through 5. The results indicated that these logico-grammatical concepts were mastered by the

fifth grade. The authors concluded that the learning disabled child performed like a younger normal child. Learning disabled children (between seven and eleven years of age) were found to make more errors than normal children on the Northwestern Syntax Screening Test (NSST) (Semel and Wiig, 1975). The children had most difficulty with question sentences, WH forms, possessive, demonstratives, and relationships between direct and indirect objects. Interestingly, no improvement with age was found for the learning disabled children. In another study, Goldsmith, Wallach, and Beilin (1974) found that learning disabled children used a different rule system from that of normal children when faced with the task of correcting ungrammatical temporal sentences, e.g., "Yesterday, the boy mails the letter." Normal children made morphological changes (changed the verb to "mailed") whereas the learning disabled children made lexical changes (changed "yesterday" to "today"). Once again, a "lack of age-related improvement" was noted (Goldsmith, et. al., 1974). Wiig, Lapointe, and Semel (1977), replicating the 1975 study of Semel and Wiig, again found that maturation did not result in improvement. Wallach (1977) reports that normal children performed better than the learning disabled children on comprehension of embedded relative clauses. The errors normal children made were the result of a

particular strategy that this population used (temporal order - NVN). The learning disabled population used several different strategies resulting in errors (first noun/actor strategy, parallel function strategy, and temporal order -NVN). In addition, some learning disabled children showed inconsistency in strategy use. The learning disabled population performed best on subject relative sentences with subject focus ("The giraffe that bites the wolf kicks the hippo.") while the normals performed best on the object relative sentence with subject focus ("The zebra hits the hippo that stands on the bear.") One of Wallach's (1977) conclusions is that the learning disabled child paid attention to individual lexical items in the sentence rather than to the whole sentence.

A similar finding is reported by Klein-Konigsberg (1977). Normal and learning disabled children were presented with a "set of sentences dealing with the same subject matter." Each sentence expressed only part of the complete idea which in turn could be expressed in a single complex sentence. For example:

Complete idea: The big bear ate the chocolate candy in the woods.

Set of sentences
(1) The bear was big.
(2) The bear ate the candy.
(3) The candy was chocolate.
(4) The bear was in the woods.

The normally achieving children were able to integrate the information contained in the related sentences while

the learning disabled population attended to individual sentences and lexical items. Klein-Konigsberg (1977) notes that the performance of the learning disabled children was similar to that of younger normals. Israel (1979) found that learning disabled children's responses were qualitatively similar to normals "but at a reduced level" in a verbal memory task. While learning disabled children used clustering as a recall strategy in the memory task, they were less efficient than the normals. Repeated trials facilitated the normal group's performance but resulted in no change for the learning disabled group. Training and cues, while generally increasing recall for the learning disabled group, did not result in increased clustering. Israel (1979) concluded that the learning disabled child performed like a younger normal child.

There have also been studies which have focused on the learning disabled child's communication (Bryan, Wheeler, Felcan, and Tomacene, 1976; Bryan, 1977; Bryan, 1980). Bryan et. al. (1976) report that learning disabled children (grades 3, 4, 5) used significantly more competitive statements ("I'm going to beat you.") and significantly fewer considerate statements ("He looks nice.") than normal children of the same age. In addition, learning disabled children were less likely to receive considerate statements. Bryan (1977) found that learning disabled children performed significantly

worse than normals on a test of comprehension of non-verbal communication (including facial expression, body posture, and intonation). Bryan (1977) concludes that learning disabled children have difficulty interpreting and responding appropriately to non-verbal communications which in turn may result in difficulties of the children's social interactions.

Finally, learning disabled children were studied in a referential communication task (Bryan, 1980). While these children performed as normal children when they were speakers, they performed poorly as listeners especially when the information was ambiguous. Furthermore, when the learning disabled child was in an "interviewer" role, the child asked fewer WH questions, requested more clarification and appeared to be more self-conscious than the normal child. Finally, the learning disabled child was less likely to bring about change in a group discussion and more likely to agree with the group (Bryan, 1980). The above studies, therefore, suggest that the learning disabled population is characterized by linguistic, cognitive and communication deficits.

Hypotheses

This study is designed to test the following hypotheses.

1. Children's comprehension of hints and indirect directives will reflect the difficulty level of the

hints. Need/want statements will be the easiest to comprehend. Hints that include humor and absurdities will be the most difficult to comprehend.

2. Comprehension of indirect directives and hints will vary as a function of the child's age. Older children will have less difficulty comprehending hints than younger children.

3. When more difficult hints are not comprehended correctly, they will be interpreted literally by the children even if this literal interpretation conflicts with their knowledge of the world. Furthermore, the intended meaning of some hints will be comprehended even when the hint cannot be explained.

4. Older children will demonstrate a greater awareness of hints than younger children. This awareness will be reflected in some statement, such as "He's using a hint.", "She's being sarcastic.", or "He's joking."

5. The learning disabled children's comprehension of hints will be poorer than that of the normal children of the same chronological age, but similar to that of younger normal children.

CHAPTER 2

PRAGMATICS: A REVIEW OF THE LITERATURE

The study of language in context or the speaker/listener's use of language is the focus of a pragmatic analysis of language. As noted in Chapter 1, the unit of study is not the isolated sentence, but rather the utterance in the larger linguistic/nonlinguistic context. Charles Morris (1938) used the term pragmatics in his characterization of language. According to Morris, language includes (a) syntax, i.e., the relation of signs to one another, (b) semantics, i.e., the relation of signs and the objects they represent, (c) pragmatics, i.e., the relation between the linguistic sign and the users. Bates (1976a) defines pragmatics as the rules which "relate linguistic form in a given context." Hymes (1971) presents the term communicative competence when talking about language in context. Communicative competence includes linguistic competence (the ideal speaker/listener's knowledge of the grammar), as well as features of language use such as feasibility (factors such as memory limitations, perceptual devices, awkwardness of structures), appropriateness (concerning the relation of sentences to verbal/extra-verbal context), and occurrence (concerning the occurrence/non-occurrence of an utterance in a context and the appropriateness of responding or remaining silent).

Ochs (1979) comments that the context of an utterance is not always easy to define. While the linguistic context and the immediate physical non-linguistic context may be obvious, one must also consider the social and psychological variables the speaker/listener brings to the communication. In fact, Bates (1976a) notes that in order to use language in context, the speaker/listener must combine linguistic, cognitive and social rules. The theories and research of several disciplines are represented in the pragmatic literature. These include philosophy of language (Austin, 1962; Searle, 1969; Grice, 1975), sociolinguistics (Hymes, 1971; Gumperz and Herasimchuk, 1975), linguistics (Gordon and Lakoff, 1975; Green, 1975; Davison, 1975), language acquisition (Halliday, 1973, 1975; Dore, 1973, 1975, 1976, 1977; Bates, 1976; Ervin-Tripp and Mitchell-Kernan, 1977; Ochs and Schieffelin, 1979) and speech/language pathology (Snyder, 1975; Geller and Wollner, 1976; Rees, 1978).

Speech Acts: Adult Language

One of the first systematic approaches to "language in use" is speech act theory advanced by Austin (1962) and later by Searle (1969). Austin initially notes that certain utterances do not describe or report anything although they appear to be statements. In fact, these utterances result in the performance of an act. An example of such an utterance is "I now pronounce

you man and wife." The speaker, by using this utterance, performs an act. Of course, certain "felicity" conditions must be met in order for the act to be performed sincerely. Only if the above mentioned utterance is used by an authorized person under the appropriate circumstances will a marriage take place. The felicity conditions include the following:

> a) The procedure must be a "conventional one with a certain conventional effect." Certain words must be uttered by certain people in certain circumstances.
>
> b) The persons/ circumstances must be appropriate for the procedure.
>
> c) The procedure must be "executed by all parties correctly and completely."
>
> d) The speaker must have the thoughts/ feelings indicated by the procedure.
>
> (Austin, 1962, p. 15)

If the first three conditions are violated, the act is not performed. If the fourth condition is violated, the act is performed but insincerely. Thus, "I now pronounce you man and wife" when uttered by a child during play does not result in a marriage because the felicity conditions have been violated. On the other hand, the utterance "I promise" when uttered by a person who has no intention of keeping the promise still results in the act of promising although the promise is insincere (Austin, 1962).

Austin (1962) uses the term "performative" when

talking about utterances that result in the performance of an act. He refers to certain verbs as explicit performatives, when used in the first person singular present indicative tense (I promise, I pronounce, I order, I bet). When used in any other tense or person, the utterance is no longer a performative but rather a statement or description (he bets, she promised). This analysis is not without problems. Austin realizes, for example, that the use of an explicit performative in the first person present tense may or may not result in an act. The verb "bet" in the utterance "I bet all the time" is no longer a performative because of the linguistic context. Furthermore, Austin speaks of utterances which result in an act being performed although an explicit performative verb is not used, e.g., insulting someone without using the performative "I insult." Austin presents "primitive devices" used in speech to perform acts. These include tone of voice, adverbs and adverbial phrases, gestures, the circumstance of the utterance, etc. In his re-examination of the performative act, Austin (1962) presents a different system of speech acts. He speaks of the locutionary act, which is the act of saying something, the illocutionary act which is the performance of an act in saying something and the perlocutionary act, which is the performance of an act "which has a result or consequence." Austin

gives examples of these three acts:

> locution : He said to me, "Shoot her."
> illocution : He advised me to shoot her.
> perlocution: He persuaded me to shoot her.
>
> (Austin, 1962, p. 101)

Yet, in these examples, Austin appears to be returning to specific verbs associated with specific acts and hence to the problems associated with the approach of explicit performatives.

Searle (1969) further defines the illocutionary act and brings us closer to an understanding of the indirect speech act. He presents his own analysis of speech acts, which include four types:

a) utterance acts - the act of uttering words
b) propositional acts - reference and predication
c) illocutionary acts - stating, questioning, commanding
d) perlocutionary acts - acts which have consequences

Searle does not accept Austin's locution/illocution distinction. Although Searle's first two act types appear to be similar to Austin's locutionary act, Searle notes that utterance acts and propositional acts do not occur alone. They occur only as part of an illocutionary act. Thus, every utterance contains an utterance act, propositional act and illocutionary act. Some utterances can also be analyzed in terms of perlocutionary acts. Finally, the same proposition can be expressed in different illocutionary acts. For example:

Does Sam smoke? (Question)
Sam, smoke. (Command)
Sam smokes. (Assertion)

(Searle, 1969, p. 22)

Searle goes on to discuss the illocutionary act, asserting that it contains a propositional indicator and an illocutionary force indicator, the latter showing how the utterance is to be understood. The illocutionary force indicator includes "word order, stress, intonation, punctuation, mood of verb, and 'performative verbs'." Often, in actual speech situations, the context will clarify the nature of the illocutionary force of the utterance. Searle's illocutionary force indicator goes beyond Austin's performative. Explicit performative verbs are not necessary for the performance of an act. In fact, Searle objects to the "classical speech act analysis" which associates a specific word with a specific act (Searle, 1969). All utterances can be analyzed in terms of their illocutionary forces when seen within their linguistic/non-linguistic contexts. Searle also presents a set of four conditions or rules which must be observed in the formation of illocutionary acts.

a) Propositional content rules describe the nature of the proposition for a particular illocutionary act, e.g. in a request, the propositional content must be a future act of the listener; in a warning, the propositional content must be a future state or event . . . .

b) Preparatory rules describe the

> speaker/hearer's beliefs which must be present in the illocutionary act, e.g., in a request, the speaker must believe that the hearer can do the act and it must not be obvious that the hearer will do the act; in a warning, the speaker has reason to believe that an event will occur and that it is not in the hearer's best interest . . . .
>
> c) Sincerity rules describe the sincerity of the speaker's desires/beliefs, e.g., in a request, the speaker wants the hearer to do the action; in a warning, the speaker believes that the event is not in the hearer's best interest; in thanks, the speaker feels grateful.
>
> d) Essential rules describe how the utterance is to be understood, e.g., in a request, the essential rule is: "Counts as an attempt to get the hearer to do the action."
>
> (Searle, 1969)

These rules are reminiscent of Austin's felicity conditions and, in fact, similar concepts are expressed in both presentations. Both sets of rules or conditions appear to be concerned with the linguistic and non-linguistic conditions which surround the speech act. However, Searle's rules are more specific and appear to describe, in greater detail, the internal structure of the illocutionary act.

Searle (1969) summarizes his analysis by presenting the distinctions which determine different illocutionary acts. These variables are:

a) the purpose of the act
b) the relative positions between the

speaker and the hearer (difference between a request and an order)
c) the degree of commitment (difference between an intention and a promise)
d) proposition expressed
e) the psychological state expressed (difference between a promise and a statement)

The same utterance may be spoken with a variety of intentions and hence result in the performance of different illocutionary acts. The illocutionary acts may overlap. For example, "It's late" may be a statement as well as an objection. Furthermore, "the meaning of a sentence does not in all cases determine what speech act is being performed . . . for the speaker may mean more than he says . . . but it is always in principal possible for him to say exactly what he means" (Searle, 1969, p. 18). The interesting part of the above statement is that the speaker "may mean more than he says." When looking at language in context, we are trying to determine how the speaker is using the utterance or what the speaker intends. If the speaker uses an utterance and means exactly what he says, there is no problem. The difficulty arises when the speaker means something more than the literal meaning. It is here that Searle presents the concept of primary and secondary illocutionary forces. In indirect speech acts, "one illocutionary act is performed indirectly by performing another" (Searle, 1975a, p. 60). In the utterance

"Can you pass the salt?" (See Chapter 1) the literal interpretation (yes/no question) is the secondary illocutionary force of the utterance, according to Searle. The primary force is the non-literal or the intended meaning (request/directive). As noted above, there is no one to one correspondence between a specific word and a specific speech act. There is no one to one correspondence between an intended meaning and an utterance.

The use of illocutionary force in the analysis of an utterance and the assertion that the primary illocutionary force of an utterance is the intended meaning rather than the literal meaning reveal the importance of incorporating context in any study of language comprehension and production. With respect to comprehension, an appropriate next question is how the listener decides whether an utterance is to be understood according to its literal interpretation or whether another interpretation beyond the syntactic/semantic analysis is necessary. How does the listener discover the speaker's intended meaning? In turn, how does the speaker formulate his utterance so as to insure that his intended meaning will be communicated?

There are several potential approaches to the resolution of these questions. One is speech act theory itself. According to Searle, indirect directives are formed

by questioning the preparatory and sincerity conditions (see above). For example, in "Can you pass the salt?" (uttered at dinner) the speaker is questioning the listener's ability to perform the act. A preparatory condition for a directive illocutionary act is that the listener can perform the desired act. If the response to "Can you pass the salt?" is affirmative, this condition for a request for salt has therefore been met. Because the utterance is made at dinner and the speaker may be expected to know that the listener is capable of passing the salt, the listener infers another meaning to the utterance, namely, that the speaker is requesting salt. On the other hand, the statement "Salt is mined in the Tatra Mountains" does not question preparatory or sincerity conditions and hence will not generally serve as an indirect request for salt (Searle, 1975b). Searle states that, in addition to speech act theory, conversational rules and background information must be used to establish the existence of the primary illocutionary force and then to comprehend the speaker's intended meaning (Searle, 1975b).

Conversational Rules: Adult Language

The study of conversation and conversational rules has two major areas of focus. One approach analyzes the mechanics or internal organization of conversation. Rules of topic establishment (Keenan and Schieffelin,

1976) and rules for systematic turntaking (Sacks, Schegloff and Jefferson, 1974) have been described. The latter rules attempt to explain such observable facts as: (a) one person talks at a time; (b) turn order and turn size vary; and (c) the distribution of turns is not specified in advance. The consequences of these rules is that the speaker/listener must closely attend to and analyze the presented utterances to ascertain whether the topic has been established, who will have the next turn and so forth. This approach also attempts to explain overlap in conversational turns and repairs of conversational errors (Schegloff, 1973; Jefferson and Schegloff,). The models resulting from the above studies show conversation to be a well-organized, cooperative venture. This theme of organization and cooperation is found as well in the second approach to conversational rules. This second approach presents rules regarding the assumptions and obligations of the speaker/listener hypothesized to be the basis on which conversation occurs and related to the meaning or content of the conversation. When these rules are accepted by both speaker and listener, listeners understand speakers and conversations work. This second approach, exemplified by Grice (1975) and later formalized by Gordon and Lakoff (1975), is referred to by Searle as necessary for a total

theory of conversation (Searle, 1975b).

Grice's (1975) first and general rule is the cooperative principle. Conversation works only when the speaker and the listener recognize their mutual cooperative roles and accept a common goal or direction for the conversation. Grice outlines four maxims of this general principle:

a) Quantity - The conversational contribution should be as informative as necessary, no more or less.

b) Quality - The speaker should not say anything that he/she believes as false or for which he/she has no evidence.

c) Relation - The contribution should be relevant.

d) Manner - The contribution should avoid ambiguities, avoid obscurities, be brief and orderly.

(Grice, 1975)

Grice hypothesizes that when an utterance is heard, the listener refers back to the cooperative principle and the conversational maxims in order to comprehend the utterance and its implications. For example:

A: I'm out of gas.

B: There's a garage around the corner.

(Grice, 1975)

A assumes B is cooperating in conversation. He further notes that B would be violating the maxim "be relevant" if B believed the garage to be closed. Therefore, A understands that the garage must be open. An example

in which a maxim is violated follows:

b) Professor A is writing a recommendation for his student B who is applying for a position in Philosophy.

A: Dear Sir: Mr. B's English is excellent and his attendance at tutorials has been regular.

Sincerely,
Professor A

(Grice, 1975)

Grice comments that the reader of this letter will assume that Professor A is cooperating because if he were not, he would not have written the letter. He surely knows that more information regarding the student is needed and he has the ability to give that information. Since he is cooperating but does not give enough information, he must be deliberately violating the quantity maxim to imply that the applicant is not a good philosophy student.

Grice states that a listener must determine whether the speaker is cooperating in the communication, whether a maxim has been violated, and, if so, which one and why. It follows, then, that the speaker, in order to communicate his message, must follow a similar series of steps although not in the same order. The speaker must decide on the message and how best to communicate it. Sometimes, the choice will involve the deliberate violation of certain conversational rules in order to communicate more than the literal meaning of the utterance.

Background Information: Adult Language

As noted above, Searle (1975b) states that background information must be used in addition to speech act theory and conversational rules in order to comprehend indirect speech acts. This background information includes information which is presupposed (Katz and Langendoen, 1976; Bates, 1976a, 1976b; Osgood, 1971), awareness of the listener/social roles (Gumperz and Hersimchuk, 1975; Ervin-Tripp, 1977), and knowledge of the world, i.e., the larger linguistic and non-linguistic context of the utterance.

Haviland and Clark (1974) use the term "given" for the information shared by the listener and speaker and the term "new" for the information that the speaker adds. For example:

"It was Percival who piqued the professor."

given: Someone piqued the professor.
new : It was Percival.

(Haviland and Clark, 1974)

Presupposed or shared information, however, is not necessarily expressed in the utterance. Bates (1976a), presenting a three-part analysis of presuppositions, states that the presupposed information may be deduced from the surface structure of the sentence or, alternatively, may not be part of the sentence at all. In a semantic presupposition, the presupposition is "deducible from the meaning of the sentence and must be true for

the sentence to be true or false" (Bates, 1976a). For example:

Mary has a white hat.

The information which is presupposed and which is "old" is that Mary exists. The statement that she has a new hat is the new or added information. Pragmatic presuppositions refer to the appropriateness of the utterance. Bates states that Austin's felicity conditions are pragmatic presuppositions. This information is not part of the sentence nor does it relate to the truth value of the utterance, but does refer to shared information. For example:

Mr. Smith, can I get your coat?

(Bates, 1976 a)

The presuppositions in the above utterance are that Mr. Smith is an adult and the speaker is not a close friend. Bates, while defining this category in terms of appropriateness, appears to be referring to such variables as social roles and sociolinguistic conventions. Bates states that these presuppositions are the "property of the speaker," i.e., they reflect the relationship between the "sentence and the speaker's beliefs about the context" (Bates, 1976a, p. 438). A third category, according to Bates, is psychological presuppositions. In this case, the information is not in the surface structure of the sentence nor is it deduced from anything in the

sentence. Rather it is a category used by Bates to describe situations in which the utterance is related to the larger linguistic/non-linguistic context. This information might be found in a past utterance, in the immediate context, in the knowledge of society or the knowledge of the world and is shared by both the speaker and listener. For example:

> "She's blonde."
> (Said by one friend to another when introduced to a woman named Mai Ling whom they assumed to be Oriental but was Swedish.)
>
> (Bates, 1976 a)

An understanding of presuppositions is necessary for the analysis of how listeners comprehend utterances which, in isolation, appear to be incomprehensible as well as how speakers decide what must be explicitly stated, what may be referred to pronominally, and what may be omitted for efficient communication.

Social rules and speaker/listener roles in conversation are also part of background information and are reflected in the utterances people use (Kingsbury, 1968; Halliday, 1973; Sacks, 1975; Gumperz and Herasimchuk, 1975; Bedrosian and Prutting, 1976; Ervin-Tripp, 1977). Once again, the terms "cooperation" and "expectations" on the part of the speaker/listener are used and the importance of context for appropriate comprehension of the utterance is stressed. Certain social contexts

necessitate certain utterances and these utterances would be inappropriate in other contexts. Most obviously, social routines, such as greetings, are rule governed and evoke specific kinds of responses from the listener (Sacks, 1975). Utterances are formed taking into account social roles. Thus:

"Come at six. We are dining early."

(Gumperz and Herasimchuk, 1975)

is appropriate for a formal dinner invitation. However, when used by a six year old to an adult, it appears humorous or presumptuous. When used by teenagers to one another, it may be understood as satire. This aspect of appropriate social roles was included in Bates' pragmatic presuppositions. The particular social role of the speaker will determine the nature of the utterance.

Halliday (1973) points out that a speaker has many options from which to choose when formulating an utterance. The utterance ultimately used will reflect role, familiarity with the listener, as well as other social variables. Social features of a situation influence adults with respect to the directive types they use (Ervin-Tripp, 1977). When social context and relationship between speaker and listener are considered, one can determine whether the utterance is appropriate and/or whether the speaker is communicating other information

like humor, sarcasm, rudeness, etc. The speaker's utterances and roles differ depending on the listener. A listener who is not a local resident needs more information and more explicit directions than a native (Kingsbury, 1968). A woman speaks differently to her peer than to her child and the type of mother's speech or "motherese" is a function of the child spoken to (Snow, 1972).

In summary, speech act theory, conversational rules and contextual factors all contribute to an understanding of indirect speech acts in adult communication.

Speech Acts: Child Language

In the case of child language studies, a relevant question is where to begin chronologically. Rees (1978) discusses the controversy regarding the prelinguistic stage of development, a stage in which the beginnings of "communicative competence" (or language in context) can be found. The researchers (Bruner, 1975a, 1975b; Bates, 1976a, 1976b; Dore, 1973; Halliday, 1973) agree that the basis for subsequent linguistic and pragmatic skills can be found in the initial interactive experiences of the infant and his environment. They disagree with respect to whether these "initial skills of the infant should be classified within a linguistic system or should be considered a prerequisite to subsequent language" (Rees, 1978). Bates (1976b), for example, after observing

the child's preverbal communication, defines a performative as the "capacity to formulate and execute a communicative intention" and a presupposition as the "ability to choose that aspect to encode" and does not confine her topic to linguistic data (p. 44). Applying these terms to the sensori-motor period results in the concept of the "proto-performative," or the pre-verbal performative. Similarly, Halliday (1975) speaks of a child's linguistic system before the child is uttering any words or structures. For Halliday, the definition of a linguistic system includes the child's vocalizations which encode a "range of alternative meanings" within the function categories of language. The important element for a linguistic system, according to Halliday, is the encoding of "meaning options," but not necessarily verbally. Alternatively, Bruner (1975a, 1975b) and Ninio and Bruner (1978) refer to the precursors and prerequisites for language in pre-speech communication when they discuss such phenomena as joint reference, role reversal in play, and ritualized dialogue between mother and child. Finally, in Dore's (1973) speech-act approach to language development, stage 1 is pre-linguistic communication which includes knowledge of objects and events as well as desires or "intentions about the objects." This stage is necessary for the development of later speech acts.

A number of researchers have investigated the functions of child language. Language has both communicative and non-communicative functions (Rees, 1973a). Halliday (1973, 1975) hypothesizes two phases in the development of linguistic functions in child language. In the initial phase, seven functions emerge which relate to pre-linguistic and linguistic communication. Phase I includes the following functions:

Function		
1. instrumental	-	The child uses language to satisfy his needs.
2. regulatory	-	The child uses language to regulate the behavior of others.
3. interactional	-	The child uses language to relate to others.
4. personal	-	The child uses language to express his identity.
5. heuristic	-	The child uses language to learn and explore reality.
6. imaginative	-	The child uses language to create reality as in pretending.

In the case of Halliday's single subject, the personal and heuristic functions emerged later than the initial four functions. (A seventh function, the informative, was the last to emerge in Halliday's subject, appearing at about 22 months.) The above listed functions, which Halliday presents as Phase I functions, describe pre-linguistic as well as linguistic communication. For

example, when Halliday's son of nine months vocalizes "ñna" while stretching his hand toward an object, Halliday interprets the vocalization as "give me that" and states that its function is instrumental. Phase II, in Halliday's system, is considered to be the transition to adult language use. In this phase, the six functions of Phase I merge into two: the pragmatic and the mathetic. The pragmatic function evolves into the adult interpersonal function which is the "speaker's interaction with others" and the mathetic function evolves into the adult ideational function, which is the expression of the speaker's experiences. In Phase I and part of Phase II specific structures match specific functions. Eventually, however, all expressions become "pluri-functional" with no one-to-one correspondence between utterance and function. With the development of grammar during Phase II, different functions can be "encoded together" within one expression (Halliday, 1973, 1975).

Other researchers also ascribe a limited set of functions to the language of the very young child. Interestingly, the functions discussed are generally communicative functions. Antinucci and Parisi (1973) present a child who would be at the Phase II level in Halliday's system. They note two linguistic functions in their data: requesting and describing, the latter function seen in terms of "causing the adult to attend

to an object or event." Gruber (1973), also studying the utterances of a Phase II child, notes the presence of "performatives," in which the speaker wants something of the addressee and "reportatives," which are "descriptions of the environment." Bates (1976b), applying the pragmatic analysis to prelinguistic vocalizations and gestures, labels the two main function categories as "imperative," or the means of obtaining objects, and "declarative," the means of obtaining adult attention on an object or event. The difference between these two functions, according to Bates, is "only in the kind of act commanded of the listener." Rees (1973a) also presents several non-communicative language functions which are used by children: the concept formation function or the words that aid the child in his formation of a concept; the directive function, or language which controls and directs one's behavioral responses; the magical function, such as the use of words as equivalent to the objects they name and to actions; and the self-image function, or language that enables a child to establish his self-concept as distinct from the world around him. On the communicative side, speech act analysis has been applied to child language. Dore (1973) analyzed the language of children at the one-word utterance level and postulates primitive speech acts of two types: idiosyncratic and socialized. He explains

the former to be "not linguistically conventional," such as practicing word-sounds out of context and protesting by screaming. Socialized acts have "at least one conventional feature of adult language" such as a request/command which includes either a word or prosodic feature of adult language. Dore's list of primitive speech acts performed by these children is labeling, repeating, answering, requesting action, requesting answer, calling, greeting, protesting, and practicing (Dore, 1975). Dore found individual differences between the two children he studied, and speculated on the possibility of the separate development of prosody and words. He noted that one child used language mainly to declare about her environment while the other child used language to manipulate others. The observation that these two linguistic styles exist and that they are both used by each of the children, albeit to different degrees, repeats the theme of the studies discussed above.

The hypothesized linguistic functions of child utterances differ from adult language functions and speech acts. Early speech acts are often routines, like greetings, where a specific utterance is used within a specific context (Bloom and Lahey, 1978). Similarly, as noted above, Halliday observes that early linguistic functions are associated with specific utterances in

one-to-one relationships (Halliday, 1973, 1975). The complexity of different functions within a single utterance and different utterances expressing the same functions develops only in the later pre-school years (according to Halliday, at the end of Phase II; according to Bloom and Lahey, between the ages of three and five). As the child learns more about his language, language use, and context, he begins to vary the messages themselves. He learns that he can choose among different messages to express a function, his choice depending on context, social roles, and other factors. A further observation is that the interpretation of young children's utterances within a speech act framework does not strictly consider Austin and Searle's felicity conditions which include, for example, knowledge of linguistic conventions (Bloom and Lahey, 1978).

By the time the child is three, he has learned that different forms can communicate his intentions and has developed a set of pragmatic strategies (Dore, 1974, 1976). The list of illocutionary acts or conversational acts for the three year old , as presented by Dore, Gearhart, and Newman (1978), reflects the primitive speech acts of the younger child (see above) but is at the same time more complex. The illocutionary act types include: requests, responses, descriptions and assertions, regulative and conversational devices, expressives and

performativs. Each type is then subdivided into more specific acts. For example:

Requests: (solicit information, actions or acknowledgement)

1. Yes/No questions or choice questions
2. Wh- questions or product questions
3. Action requests
4. Permission requests
5. Process questions
6. Suggestions

(Dore, Gearhart, and Newman, 1978)

Dore (1974, 1977) proposes the use of canonical and non-canonical forms of each illocutionary act type. The canonical form (the "simplest standard form") is that grammatical form which in its literal sense matches the illocutionary act type. When a canonical form is used, the hearer will immediately recognize the speaker's message. When a non-canonical form is used, the hearer will have to "make inferences of varying degrees" regarding the speaker's intentions. The canonical form for an assertion is the declarative, for a request it is an imperative and for a question it is the interrogative. A child who requests juice by saying "Give me some juice" is using the canonical grammatical form for that speech act. If, however, the child says, "I want juice" or "Can I have some juice?" or "There's some juice," the child is using a non-canonical form (Dore, 1976). By the age of three,

children have learned some of these non-canonical or indirect forms.

Conversational Skills: Child Language

Some of the more formal aspects of conversational organization have also been studied in child language. There is some evidence that very young children (one word stage) are able to secure listener attention and establish the topic simultaneously, albeit in a rudimentary manner (Atkinson, 1974). And while children (age 2:9) are able to maintain the topic over conversational turns (Keenan, 1974), it is also true that they exhaust the topic more quickly than adults (Bloom, Rocissano, and Hood, 1976). Children display different ways of securing listener attention, including utterances such as "look" and "see", increased amplitude and "repeated requests for attention" (Keenan and Klein, 1975). Children are able to repair their messages, although the strategy they use depends on their linguistic stage (Keenan and Schieffelin, 1976; Gallagher, 1977; Clark and Anderson, 1979; Haskelkorn, 1979). Turn-taking is a skill which children display in sound play and in conversational speech (Keenan, 1974; Keenan and Klein, 1975). Specific kinds of conversational turns have been studied (Garvey, 1975; Dore, 1977). Finally, it has been suggested that children who want to maintain verbal contact, but have nothing to say, will resort

to ritualistic or play conversation. This non-social interaction has been found to follow "long stretches of social speech" (Garvey, 1975).

Attempting to look at child conversation within the framework hypothesized for adults, researchers have also applied the theoretical conversational rules to child language. As mentioned above, Dore (1977) suggests a canonical/non-canonical distinction when analyzing the forms used by children in their illocutionary acts. Dore hypothesizes that when a child is asked a question he will respond with a canonical response if certain "conditions" are met. These "conditions" are reminiscent of Searle's rules for the formation of illocutionary acts and conversational rules (See above). The conditions which Dore suggests are:

1. The listener comprehends the proposition underlying the question.
2. The listener believes the proposition is true.
3. The listener recognizes the addresser's expectation in asking the question.
4. The listener believes the addresser wants the requested information.
5. The listener believes the addresser does not know the requested information.
6. The listener knows the answer.
7. The listener is willing to respond, i.e., has no more pressing desire.

(Dore, 1977)

If one of these conditions is not met, a non-canonical response will be given. Davison (1974) speaks in terms of sincerity conditions, relevance conditions and a "good will" condition when discussing the responses of young children (MLU = 1.78-2.16 and 3.37-4.15) to play utterances. A very young child (one word utterance level) does not pay attention to nor does he appear to recognize a play utterance. A somewhat older child recognizes an insincere or false utterance but is unsure of whether the utterance is used in play or seriously when the speaker is unfamiliar to her. Davison suggests that the child functions with the assumption that an unfamiliar adult will not try to confuse or mislead on purpose. Davison further notes the importance of cooperation within the conversational dyad during play and suggests that children are aware of this rule of conversation.

Background Information: Child Language

It is also clear from the literature that young children are aware of and consider presuppositions, listener needs, and social roles in their conversational speech. A high percentage of pronominalization in the subject position of utterances used by children (ages three to five years) is said to reflect the child's awareness that the "topic is known by the listener, or presupposed, and greater specification is not needed"

(Shields, 1975). Dore (1977) suggests that young children (ranging in age from 2:10 - 3:3) answer some questions with non-canonical responses when they respond to the presupposed information in the question. For example:

Q: "What number are you making?"

A: "I'm not making a number."

In this question and answer sequence, the response is related to the presupposition of the question which is false. First and third graders perform better than chance when presented with a task involving the comprehension of logical presuppositions and pragmatic presuppositions. Third graders perform as well as adults (Ackerman, 1978b). Older children (six to ten years of age) organize their utterances syntactically depending upon the perceptual array with which they are presented. Aspects which are repeated in the situation are presupposed and the focus of the utterance is on the "new" information (Greenfield and Dent, 1979).

When a speaker omits vital information from his utterance, he makes assumptions about shared information and the listener's needs. Research has shown that the child speaker can respond to listener needs although in a limited fashion (Shatz and Gelman, 1973; Gleason, 1973;Maratsos, 1973). Children talk differently to different listeners. Eight-year-olds have developed different speech styles depending on whether they are

talking to an adult , a peer, or a younger child (Gleason, 1973). Four-year-old children adjust their speech to two-year-olds (Shatz and Gelman, 1973) as well as to dolls who they pretend to be two-year-olds (Sachs and Devin, 1973). Even the two-year-old speaker has some control over different request forms which "vary with the social setting" (Ervin-Tripp, 1977). Finally, the four-year-old's description of toys is more explicit when the listener is blindfolded than when he is sighted (Maratsos, 1973), once again revealing the young child's awareness of the listener's needs.

Shatz and Gelman (1973) note interesting differences between the four-year-old's talk to two-year-olds and to adults in their data. When speaking to adults, the four-year-olds used a wide range of topics and talked about mental states. They expressed the "degree of certainty" of their statements, saying, "I think this is a lamb" to suggest room to doubt the assertion. When talking to young children, the four-year-olds used direct speech and did not "modulate" their statements with disclaimer like "I think." This latter finding, however, appeared to depend on the particular setting. In less structured situations, "modulations" were used by four-year-olds when talking to younger children (Gelman and Shatz, 1977). Four-year-olds appeared to choose topics that they felt would interest the particular

listener. Furthermore, both four-year-olds and adults speak to two-year-olds in sentences which are short and generally syntactically simple. At the same time, however, there are differences between the way mothers and four-year-olds talk to younger children. Mothers tend to use hints while four-year-olds don't. Four-year-olds are more direct and abrupt than the mothers (Shatz and Gelman, 1973). This latter finding might reflect the four-year-old's dissatisfaction with the task of playing with younger children. On the other hand, it may also reflect some lack of knowledge on the part of the four-year-old of sociolinguistic rules and conventions (Shatz and Gelman, 1973). Thus, while children do take account of their listener and modify their speech accordingly, the result may nonetheless differ from adult speech in similar situations.

The assumptions the child makes regarding his listener and his listener's information may not always be accurate and may lead to poor communication. This finding has been noted when children are presented with the "communication game." In this task, the speaker and the listener are separated by a screen. Both have an identical set of stimuli. The speaker must describe a particular stimulus and the listener is then required to choose the stimulus which the speaker has described. Children (52-63 months) are able to perform this task

with little difficulty when adults are the speakers. However, when both speaker and listener are children, performance is poor. Children use idiosyncratic messages in their description of stimuli. While these messages may be meaningful to the speaker, they are not effective for the listener. It has been suggested that these results reflect an interplay of a variety of factors, specifically the child's ability to communicate with a given listener and take the listener's needs into account. More difficult tasks result in a decrease in communicative performance. When the task is simplified, the child's communication improves and approaches the adult performance (Krauss and Glucksberg, 1977).

The awareness of listener needs is clearly related to the awareness of social roles. Bates (1976b) found that three year olds were generally unable to change their requests when told to be polite. The children only added "please," softened their intonation, and lowered their voices or reduced their demands. Gumperz and Herasimchuk (1975) point out differences between a child and a teacher who have both assumed similar roles, i.e., that of teaching another child. The differences in verbal strategies between the two "teachers" are explained in terms of "roles." The child teacher must explicitly define and state her role to her peers and therefore is more direct and explicit with her comments and commands.

The adult teacher's language is more indirect. This finding is reminiscent of the kind of speech Shatz and Gelman (1973) report used by mothers and four-year-olds when talking to two-year-olds. In this latter case, mothers are also more indirect and use hints while four-year-olds are more explicit (see above). It may be that these four-year-olds are also attempting to establish their position of authority with the younger children.

The older child is aware not only of all forms of directives but also of the use of the different forms depending on the speaker's role. Children role-playing as adults use certain directive forms more often than when they are in the "peer role" (Mitchell-Kernan and Kernan, 1977). Furthermore, the directive forms children use (age 4:1-7:1) vary as a function of the adult role they play (Anderson, 1978). Thus, for example, children role playing as doctors used imperatives 64% of the time when talking to a "nurse." Children role playing as "nurse," however, used imperatives only 33% of the time when talking to the "doctor." When imperatives were used by children (age 7-12) to individuals higher in rank, there were accompanying "modulating" features (vocal quality, manner of speaking) suggesting that the utterances could be considered protests as well as imperatives (Mitchell-Kernan and

Kernan, 1977).

The literature suggests that even young children display some, albeit limited, pragmatic skills. The use of speech acts, the ability to organize and cooperate in conversation and the use of background information as a speaker/listener all develop as the child grows into a mature communicator.

CHAPTER 3

METHODOLOGY

The purpose of this study is to assess the comprehension of the most difficult type of indirect directives, hints, by normal and learning disabled children at different age levels. Forty-eight normal children and thirty-six learning disabled children took part in this study. The children were told stories (accompanied by pictures) which ended with a hint of varying difficulty. They were then asked, "What happened next?". The children's responses were recorded as correct or incorrect. Probe questions were asked to assess comprehension further.

Materials: Hints and levels of difficulty

An initial set of ten hints per story was devised for each of the first ten stories. Within each set, the hints differed in terms of explicitness. Ervin-Tripp (1977) states that the explicitness of a directive is dependent on the identification of the intended agent, act and object or goal. In addition, she states that these have not been controlled in a comprehension study. The explicitness of the hints in this study was varied by omitting some or all of the above mentioned variables (actor, act, or object), as well as by adding humor and/or absurdities. In some of the stimuli, therefore, only two elements of the directive were retained

(actor + object; action + object; actor + action); in some stimuli, only one element was retained (actor, action or object); and in some stimuli, all the elements of the directive were omitted. In addition, some of the hints were humorous or absurd statements (See Table 1 for examples).

The initial ten sets of stimuli were presented to 15 naive adult judges who were asked to rate each hint (within a set) according to comprehension difficulty on a scale of one to five, from least to most difficult. The following instructions were given to the judges:

> On the top of each page you will see a statement, e.g., Take out the garbage. Below this is a list of 10 different ways this could be said if one person wanted to give another person a hint. Some of the hints are easy to understand and some are more difficult to understand. Please rate the different hints according to the following scale. Circle the number which you feel best describes the ease or difficulty of the hint.
>
> Scale
> 1. easy hint: very easy to understand
> 2. mild hint: fairly easy to understand
> 3. moderate hint : somewhat difficult to understand
> 4. difficult hint: difficult to understand
> 5. obscure hint : cannot understand
>
> You may find that on certain lists all the hints are easy or all the hints are hard or the hints are easy and hard. Rate them as you would understand them.

The judges' ratings were averaged and the mean of the ratings for each hint became the difficulty rating (dfr) for that hint. The ten sets of ten hints were then

Two elements of the directive retained	Example	Intended directive
1. actor + object	I see you have the towel.	Give me the towel.
2. actor + action	I see you are throwing to each other.	Throw the ball to me.
3. action + object	Some lights should be turned off.	Turn off the lights.

One element of directive retained	Example	Intended directive
1. actor	I see you are resting.	Carry in the packages.
2. action	I wish someone would pass the spices.	Pass the salt.
3. object	There's no money in my wallet.	Give me some money.

No elements retained	Example	Intended directive
	I have some soap.	Wash your face.

Humor/absurdity added	Example	Intended directive
	Someone should move this driveway.	Move your car.

TABLE 1

Examples of hints with some or none of the directive elements retained

presented to another three naive judges who were asked to rank them from one to ten in order of difficulty.

From each set of ten, four hints were chosen for each story. These four were statements whose difficulty rating (dfr) corresponded to the rank order. Each of the initial ten stories, therefore, had four hints at different levels of difficulty. For example:

> Joey is playing and putting things in the fireplace. When he goes into the next room, his brother says (directive: wash your face):
>
> I. Your face needs washing. (dfr - 1)
> II. What a dirty face. (dfr - 1.66)
> III. I have some soap. (dfr - 2.86)
> IV. Next time, leave some dirt for me. (dfr - 3.3)

The hints were studied to determine what factors resulted in their difficulty rating. The analysis is presented in Table 2. On the basis of this analysis, sets of four hints were devised for the next ten stories. All the hints were statements. (See Appendix A for stories and hints.).

It should be noted that the omission of the actor, action and/or object elements of a directive when formulating a hint does not necessarily insure that the hint will be difficult. Some hints, especially those in common use in society, are easy to understand even if all the elements are missing. Thus, "It's raining out" does not contain any of the elements of the intended directive "Take an umbrella." Yet, when stated in the appropriate context, this hint is easily understood.

Level I: (dfr 1-1.5)

These hints did not specify the actor. Most included the action and object in a passive utterance. Those that did not include the action were need/want statements. All hints included the desired object or goal.

Example: Your face needs washing.
(Wash your face.)

Level II: (dfr 1.5-2.2)

Some of these hints included two aspects of the directive (actor + action; actor + object). If only one aspect was mentioned, it was the object of the directive.

Example: What a dirty face.
(Wash your face.)

Level III: (dfr 2.3-3.06)

These hints were statements which in the context of the story could be true. The object of the directive was not mentioned. If the hint contained one aspect of the directive, it was either the actor or the action. Some of these hints did not contain any of the three directive elements.

Example: I have some soap.
(Wash your face.)

Level IV: (dfr 2.9-4)

These hints were similar to Level III hints in that they contained one aspect (actor, action) or no aspects of the directive. Objects of the intended directive were not mentioned. They differed from Level III hints in that they contained humor, irony or absurdities.

Example: Next time, leave some dirt for me.
(Wash your face.)

TABLE 2

Difficulty levels for hints

The hints used for this study were formulated with this observation in mind and an attempt was made to avoid routine hints, especially at levels III and IV.

In addition to the above mentioned twenty stories and their hints, another five control stories ending with non-directive utterances were developed (See Appendix A).

For example:

> Mother gave Amy the scissors.
> Amy says, "Wow, thanks, those are your big scissors." (What happened next?)

Three training stimuli were also devised. These stories ended in explicit directives (See Appendix A). For example:

> Sarah went to the store. When she returned, Billy said, "Show me what you bought." (What happened next?)

All stories were accompanied by a set of three or four photographs presenting the story elements visually.

Research Design:

The independent variables in this study were: Subject Type (normal vs. learning disabled), Subject Age (four ages for the normal subjects and three ages for the learning disabled subjects), and Hint Level (four levels of difficulty). The dependent variable was the subjects' verbal responses to the question, "What happened next?" asked after each hint.

Groups:

This study was designed to present all the stories and hints at all four levels of difficulty to all the subjects. However, it would not be meaningful to present the subjects with a story and all the hints associated with that story. Once a subject was exposed to a story and a particular hint for that story, the subject could not be presented with a different level hint for the same story. Therefore, counterbalanced groups were designed. Subjects at each age were assigned to one of four groups. There were three subjects in each group at each age for the normal population and the learning disabled population. Each group was presented with all the stories. The groups differed with regard to the specific hints they heard for a particular story. Group A heard Level I hint for Story 1, Level II hint for Story 2, etc. Group B heard Level II hint for Story 1, Level III hint for Story 3, etc. (See Table 3). All the groups were therefore presented with all hint levels and were exposed to all stories, although the specific hints for specific stories differed from group to group.

Subjects:

The normal subjects consisted of children at grades 1, 3, 5 and 7 who attended public school in Dumont, New Jersey. The children were chosen at

STORY #	HINT LEVEL 1	2	3	4
1	A	B	C	D
2	D	A	B	C
3	C	D	A	B
4	B	C	D	A
5	A	B	C	D
6	D	A	B	C
7	C	D	A	B
8	B	C	D	A
9	A	B	C	D
10	D	A	B	C
11	C	D	A	B
12	B	C	D	A
13	A	B	C	D
14	D	A	B	C
15	C	D	A	B
16	B	C	D	A
17	A	B	C	D
18	D	A	B	C
19	C	D	A	B
20	B	C	D	A

TABLE 3

Counterbalancing of Hints

Letters (ABCD) represent the groups:

Group A heard Story 1 hint level I,

Story 2 hint level II, etc.

Group B heard story 1 hint level II,

Story 2 hint level III, etc.

random. The mean age for the children at each grade was: grade 1 - mean age, 6.1; grade 3 - mean age, 8.3; grade 5 - mean age, 10.2; and grade 7 - mean age, 12.4. Twelve children were tested at each age . The learning disabled subjects consisted of children who were matched for age with the normal population (grades 3, 5 and 7) and who had been classified as learning disabled by the evaluation team of three school systems: The public schools in Dumont, New Jersey; the public schools in Fort Lee, New Jersey; and The Community School in Englewood, New Jersey. Twenty-six of these children had been classified as "perceptually impaired" and ten as "neurologically impaired" on the basis of "soft signs." The children had normal intelligence and were at least two years below age in their reading skills. Children with obvious behavioral or emotional problems were eliminated. The mean age for the learning disabled children at each grade was: grade 3 - mean age, 8.1; grade 5 - mean age, 10.1; and grade 7 - mean age, 12. No learning disabled children were tested at the youngest level (grade 1) because too few children at that age had been identified by the evaluation team of the schools as learning disabled. Twelve children were tested at each age . A total of 84 children were tested (48 normal and 36 learning disabled children).

Procedure:

Each subject was seen individually in a quiet room. The subjects were told that they would be playing a game with the experimenter and in this way, helping the experimenter to complete a school assignment. They were assured that the results would not be shown to anyone. This assurance was particularly important for the learning disabled group who were very apprehensive of the testing situation. The children were also shown prizes that they would win at the conclusion of the "games."

The subjects were instructed as follows:

> I am going to show you some pictures and tell you stories about the pictures. At the end of each story, I want you to tell me what happened next.

The children were presented with the three training stimuli. Any child who could not respond appropriately to these stimuli was eliminated from the study.

Following the training stimuli, each subject was presented with twenty-five stories and the accompanying pictures (twenty experimental stimuli and five control stimuli). The specific hint each subject heard for each story depended on the group the subject was assigned to. The presentation of stimuli was in random order. After each story and hint, the examiner asked, "What happened next?" The child's response was recorded

as correct or incorrect and classified according to response type (See Tables 4 and 5). The examiner then asked two probe questions to ascertain further the child's comsprehension of the indirect directive/hint.

(1) Why did [speaker] say this [hint]?

(2) So what happened next?

All sessions were tape recorded.

Classification of response:

The classification of responses is shown in Table 4 and 5. The child's initial response to the hint was the response tabulated as part of the data for this study. Responses to probe questions, while of interest and mentioned later, were not included in the tabulated data.

Some responses could be classified under two headings. A child could respond with a correct or incorrect response which included a "verbal" element. To illustrate:

hint : The soup needs salt.
child: The mother said, "Sure" and passed the salt.

This response was classified as a correct response for the data of this study. However, it was also included in a separate tabulation of responses with verbal elements. The same kind of classification could occur with incorrect responses. For example:

hint : It's really warm in here.
(Man has just come in and is sitting wearing his coat.)
child: He said, "Thanks" and left.

This response was classified as an incorrect response for the error analysis. It was also included, however, in the tabulation of responses with verbal elements.

Errors were analyzed in terms of directiveness. Responses were considered incorrect if the hint was not understood as a directive, if the incorrect actor was specified, if an additional directive was given after the hint, and finally if the incorrect action was specified. If a child's response specified the wrong actor and the wrong action, the response was classified only once, as a response specifying wrong actor. For example:

hint : I need sunglasses in here.
child: Then the father got himself some sunglasses.

This response was classified as $X_{s/a}$ (speaker as actor) and the incorrect action was not considered. If, however, the correct actor was specified by the child, then the action specified by the child was considered and became the basis of a correct or incorrect classification.

CLASSIFICATION			EXAMPLE
1. ✓	: correct:	The child's response specified the appropriate actor and action. Responses wherein the child indicated that the story character refused to comply with the intended directive are also classified here.	1a. hint: What a place to park that car. child: She moved the car. 1b. hint: You boys aren't asleep. child: They said, "But Mom, we aren't tired."
2. ✓ + vrb:	correct:	The child's response specified the appropriate actor and action. In addition, the child indicated that the story character added a verbal response.	2. hint: The soup needs salt. child: The mother said, "Sure" and passed the salt.
3. ✓ Exp:	correct:	The child's response correctly explained the story situation.	3. hint: I see you have the towel. child: She is asking him for the towel.
4. ✓ Px:	correct:	The child's response specified the appropriate actor and action. However, in response to the probe questions, the child did not explain the hint or indicate its relationship to the story.	4. hint: Rain isn't so wet. child: He put on his raincoat. Examiner (probe): Why did she say "Rain isn't so wet"? child: I don't know; it doesn't make sense.
5. ✓ Alt:	correct:	The child's response specified the appropriate actor and an appropriate alternative action.	5. hint: I already see the cavities. (Stop eating the candy.) child: He went and brushed his teeth.
6.	: hint awareness	The child's responses included the terms such as hints, politeness, sarcasm, etc., thereby indicating an awareness on the part of the child that a hint was presented.	6a. hint: It's very warm in here. (Man is sitting with his coat.) child: He took off his coat. Examiner (probe): Why did she say this? child: Because she didn't want to be rude and say "Give me your coat." 6b. hint: My feet hurt. (Mother is waiting to get into the bathroom.) child: The girl opened the door. Examiner: Why did she say this? child: It's a hint--she's saying open the door.

TABLE 4

Classification of Correct Responses

CLASSIFICATION		EXAMPLE
1. ND: incorrect:	The child's response was a descriptive statement or explanation and did not include the appropriate actor or action. Responses wherein the child indicated that the story character responded to the hint with a statement were also included. The response indicated a nondirective understanding of the hint.	1a. hint : I have some soap. child: He had some soap. 1b. hint : I need sunglasses in here. (All the lights were on.) child: He needs sunglasses to see what he is doing. 1c. hint : I see you're resting. child: The boy said, "I'm not resting."
2. $X_{s/a}$: incorrect:	The child's response specified the speaker of the hint as the actor.	2. hint : (father to children) All the lights are on. child: Then the father turned off the lights.
3. X_D: incorrect:	The child's response specified that an additional directive was presented to the listener in the story.	3. hint : I see you have the towel. child: Then she asks him for the towel.
4. X_A: incorrect:	The child's response specified the wrong actor.	4. hint : I thought there was salt on the table. child: The mother and father went into the kitchen to find the salt.
5. X_{LA}: incorrect:	The child's response specified the correct actor but the wrong action.	5. hint : I need sunglasses in here. child: The children got him sunglasses.
6. NR: incorrect:	The child did not respond or said "I don't know."	

TABLE 5

Classification of Incorrect Responses

CLASSIFICATION			EXAMPLE
7.	O: other	: These responses were not considered correct or incorrect.	7. hint : Rain isn't so wet. child: He went out.
8.	X + verb : incorrect:	The child's response was incorrect. In addition, the child indicated that the story character added a verbal response.	8. hint : It's really warm in here. (Man is sitting in his coat.) child: He said, "Thanks" and left.
9.	X_P: incorrect:	The child's response was incorrect. However, in response to the probe question, the child responded with a totally correct response.	9. hint : You wrote this with your toes. child: He said, "My toes hurt when I write with my toes." Examiner (probe): Why did she say that? child: Because the paper was sloppy. Examiner: So what happened next? child: He typed it.
10.	X_{PA}: incorrect:	The child's response was incorrect. However, in response to the probe question, the child responded with the appropriate action. The child's response did not correctly specify the relationship of the hint to the story.	10. hint : The store could send a hairdryer. (Mother's hands are wet and boy has the towel.) child: He got a hairdryer. Examiner (probe): Why did she say that? child: I don't know--her hands are wet--to dry her hands with the hairdryer. Examiner (probe): So what happened next? child: He gave her the towel.
11.	: hint awareness :	The child's response was incorrect but included such terms as hint, politeness, sarcasm indicating an awareness on the part of the child that a hint was presented.	11. hint : The store could send a hairdryer. (Mother's hands are wet and boy has a towel.) child: It's a hint for him to get a hairdryer.

TABLE 5 - Continued

CHAPTER 4

RESULTS

The data for the learning disabled subjects (LD -- ages 8, 10, 12) and the normal subjects (N_1 - ages 8, 10, 12) were analyzed. It should be noted that there were six year old normal subjects but no six year old learning disabled subjects in this study (see Methodology). An additional analysis, therefore, for the normal subjects, including the six year old children (N_2) was also done. The data were analyzed at four hint levels (HL I, HL II, HL III, HL IV).

Analysis of variance revealed that the three main variables of subject type, age and hint were significant. Further analyses of the data using the Tukey and Scheffee tests were performed to determine the specific means that were significant (See Hints, Subject Type, and Age below). Analysis of variance by subjects revealed certain significant effects. The normal subjects performed significantly better on the comprehension of hints than the learning disabled (LD) subjects, $F(1,48) = 25.931$, $P < .001$. Older children performed significantly better than younger children, $F(2, 48) = 4.065$, $P < .02$ and hint levels differed significantly, $F(3,144) = 69.552$, $P < .001$. Analysis of variance by stories also resulted in significance for the main variables of subject type, $F(1,19) = 130.266$, $P < .001$; hint levels,

F (3,57) = 20.560, P < .001; and age, F (2,38) = 10.892, P < .001. Analysis of variance of the normal population including six year olds (N_2) resulted in significance for the main variable of age, F (3,32) = 12.499, P < .001, and hint level, F (3,96) = 52.547, P < .001 (See Appendix B for analysis of variance tables).

Hints

HL I and HL II differed significantly from HL III and HL IV (Scheffee, P < .001). This was true for the N_1 + LD data combined, the LD data and the N_2 data. Tables 6 and 7 present correct responses (means) for the N_1 and LD subjects and for the N_2 subjects. In addition, a Tukey analysis revealed a significant (P < .05) difference between HL I and HL II (See Figures 1, 2 and 3) (See Appendix C for a comparison of the correct response means among hint levels for each individual story).

Age

Age was a significant variable in this study. Age was not significant, however, for the LD subjects nor for the N_2 subjects at all ages.

Table 8 and Figures 4-6 present mean correct responses for the normal and learning disabled subjects. The six year old normal children performed significantly poorer than the older normal children (Tukey, P < .05). There was no difference among the three ages

Hint Level	Correct Responses (Means)
I	.839
II	.747
III	.492
IV	.481

Table 6: Correct responses (means) for the learning disabled and normal subjects (N_1) combined at four hint levels.

Hint Level	Correct Responses (Means) N_2	LD
I	.858	.822
II	.762	.694
III	.487	.394
IV	.512	.328

Table 7: Correct responses (means) for normal subjects (N_2) and for the LD subjects at four hint levels.

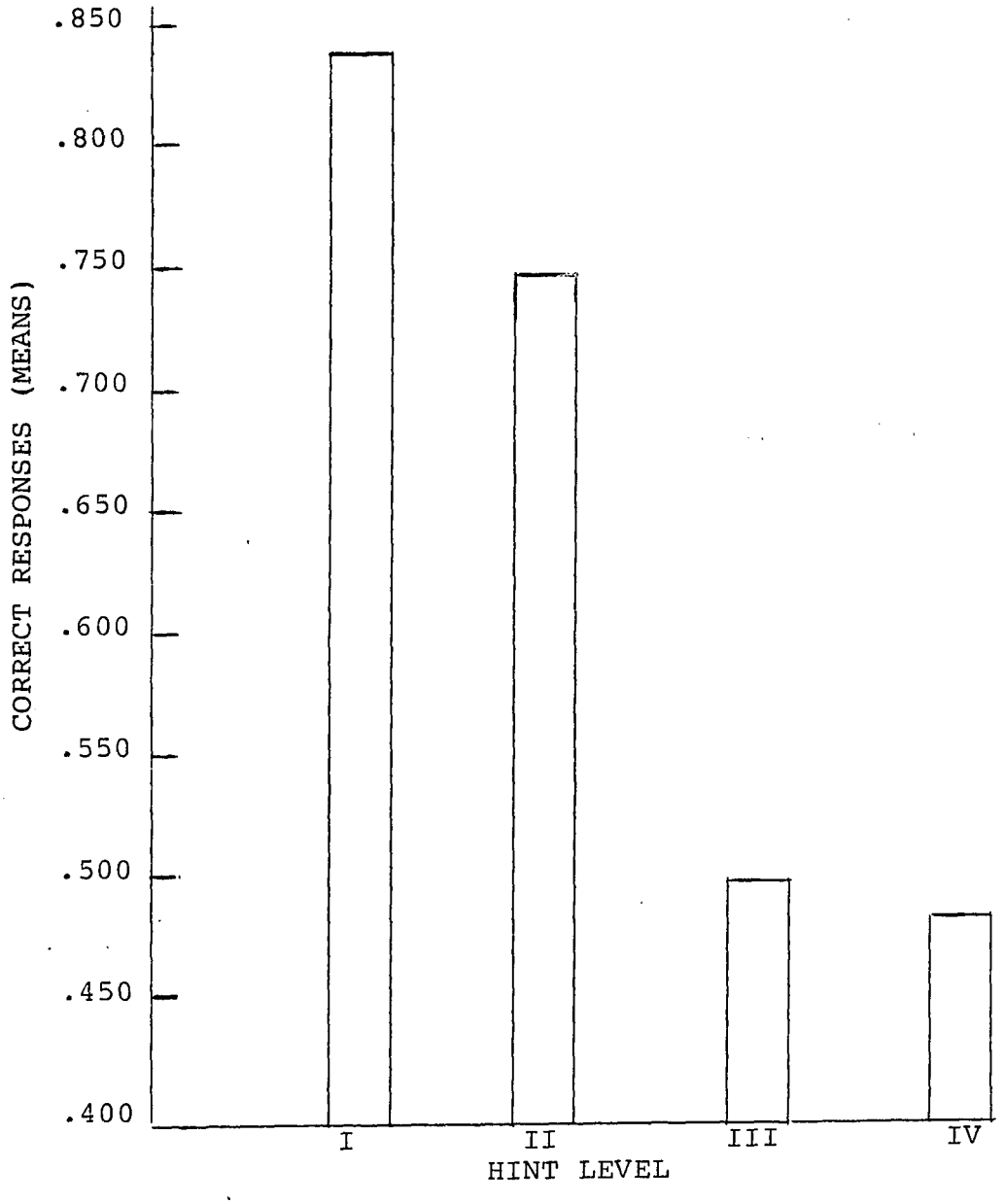

Figure 1. Correct responses (means) for hints at four levels of difficulty for normal (N_1) and learning disabled subjects.

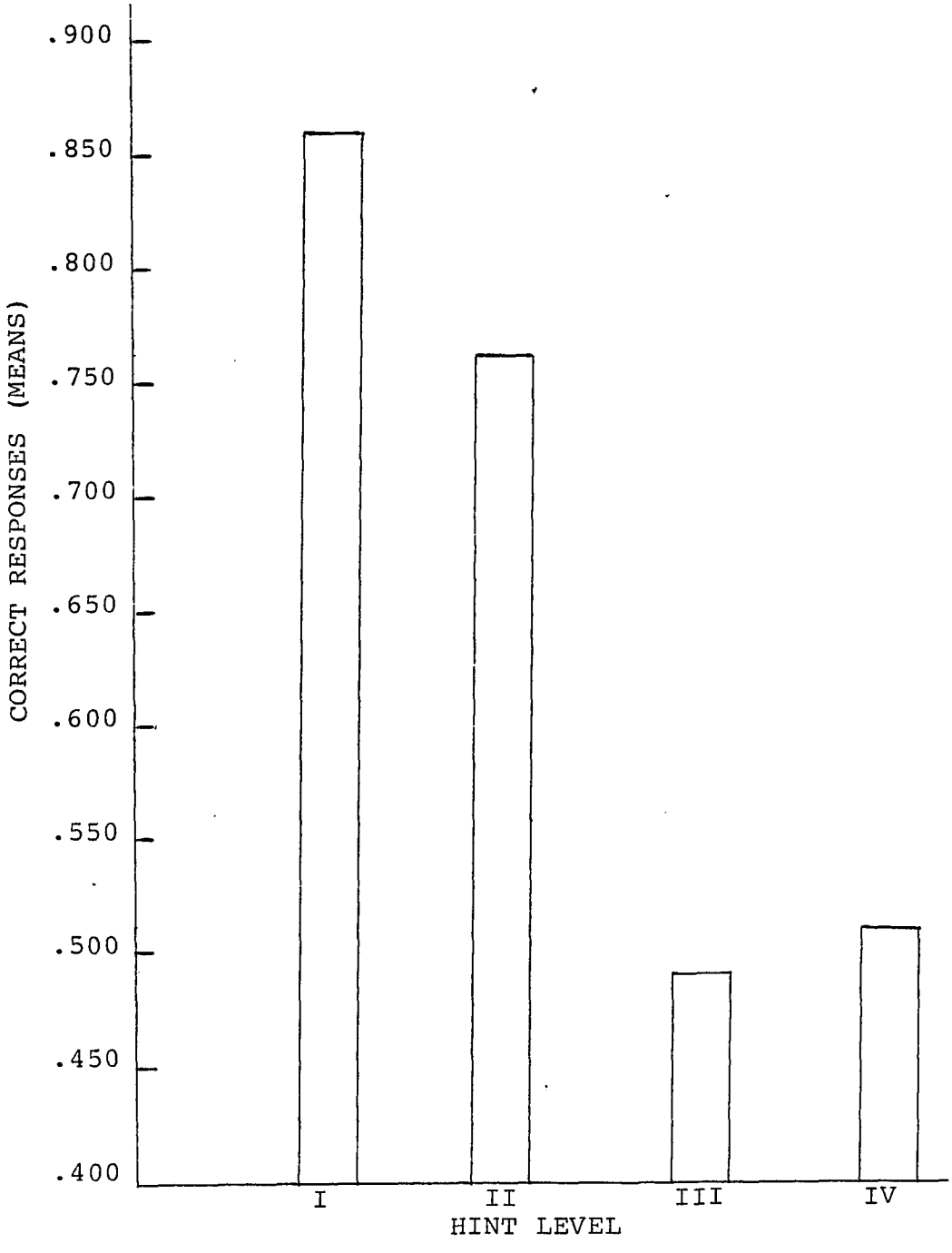

Figure 2. Correct responses (means) for hints at four levels of difficulty for the normal (N_2) subjects.

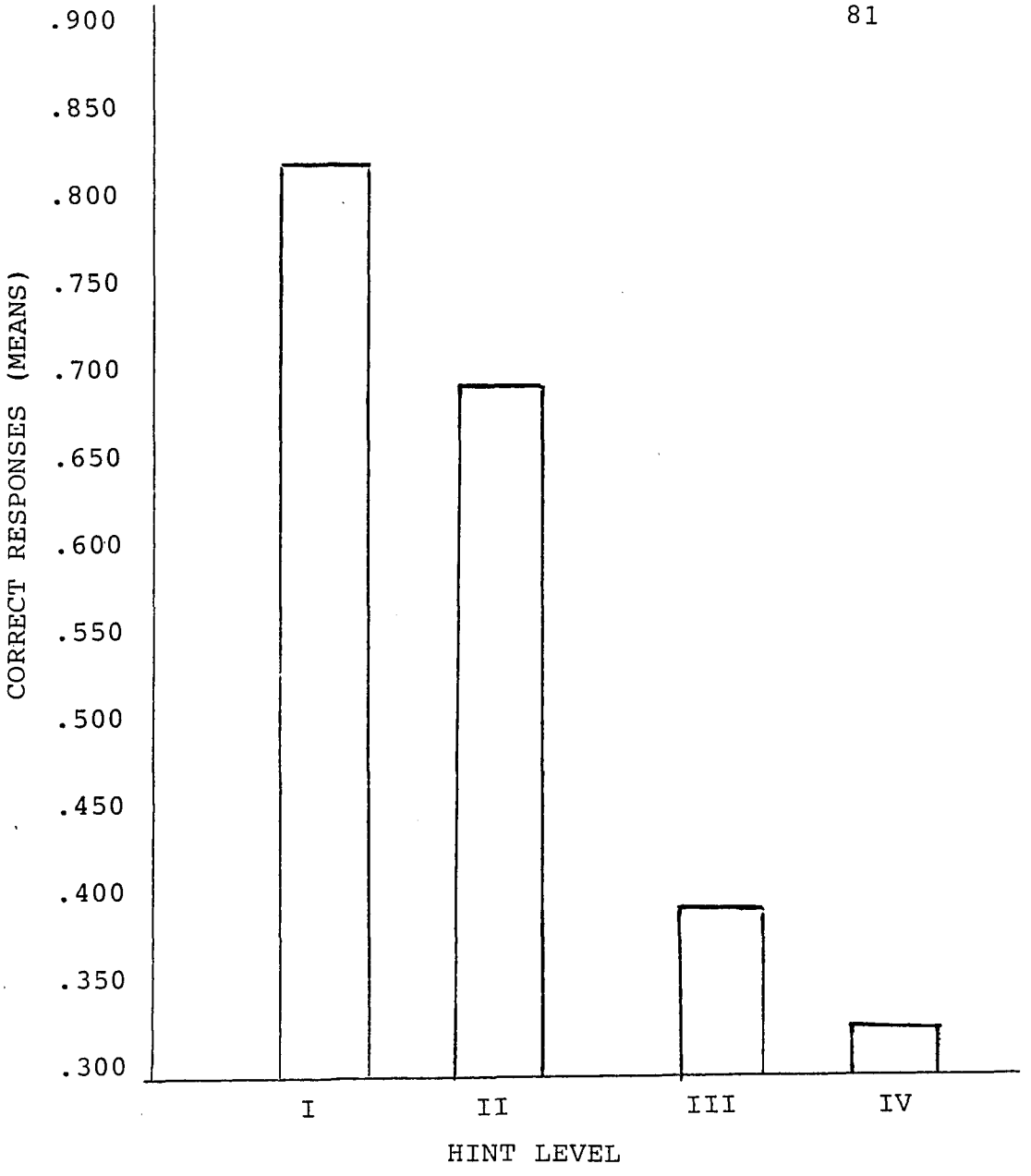

Figure 3. Correct responses (means) for hints at four levels of difficulty for the LD subjects.

	Correct (means)		
Age	Normal	Learning Disabled	Normal and Learning Disabled Combined
six	.462	----	.462
eight	.633	.521	.577
ten	.746	.579	.662
twelve	.779	.570	.679

Table 8: Correct responses (means) for normal and learning disabled subjects at four ages.

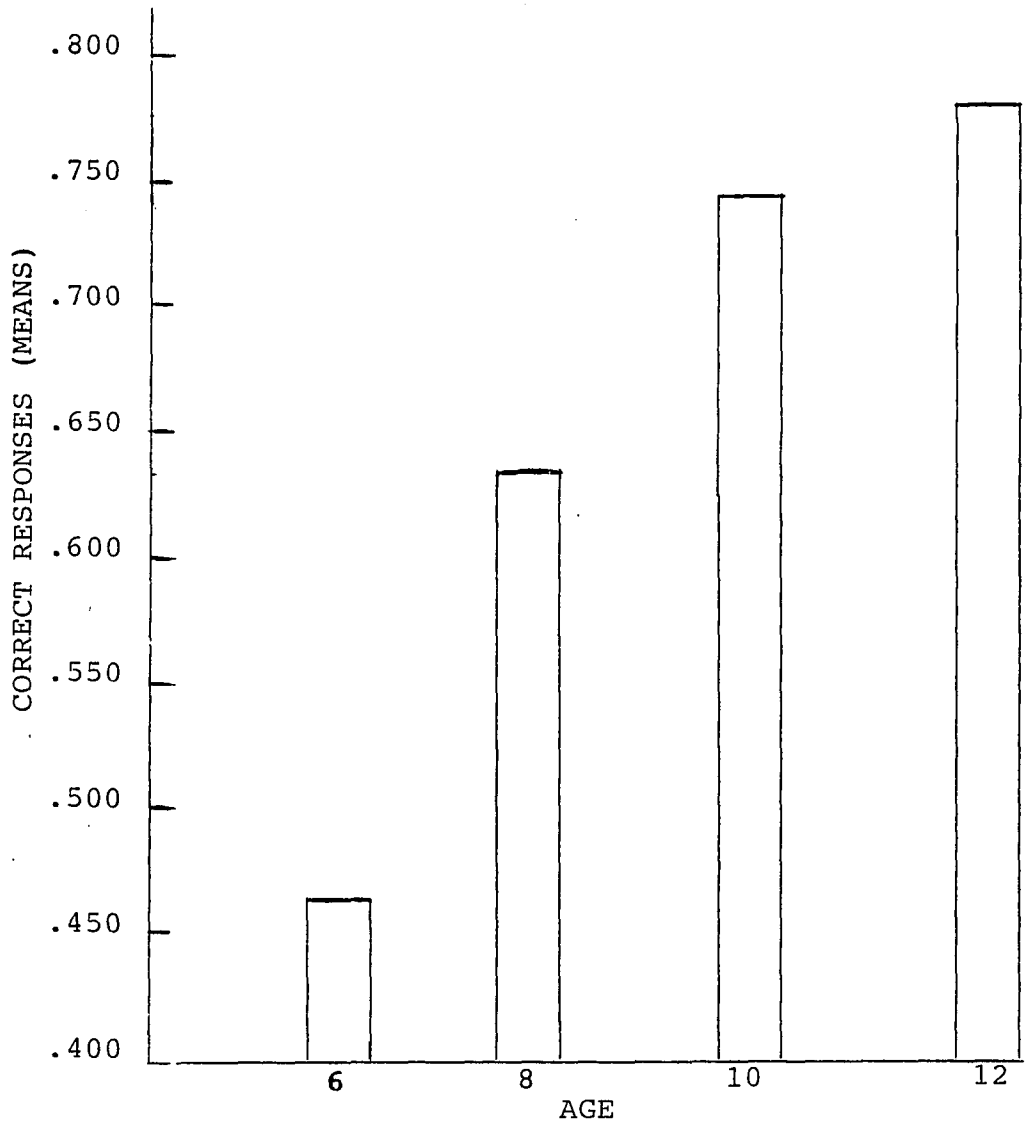

Figure 4. Correct responses (means) for the normal population (N_2) at four ages.

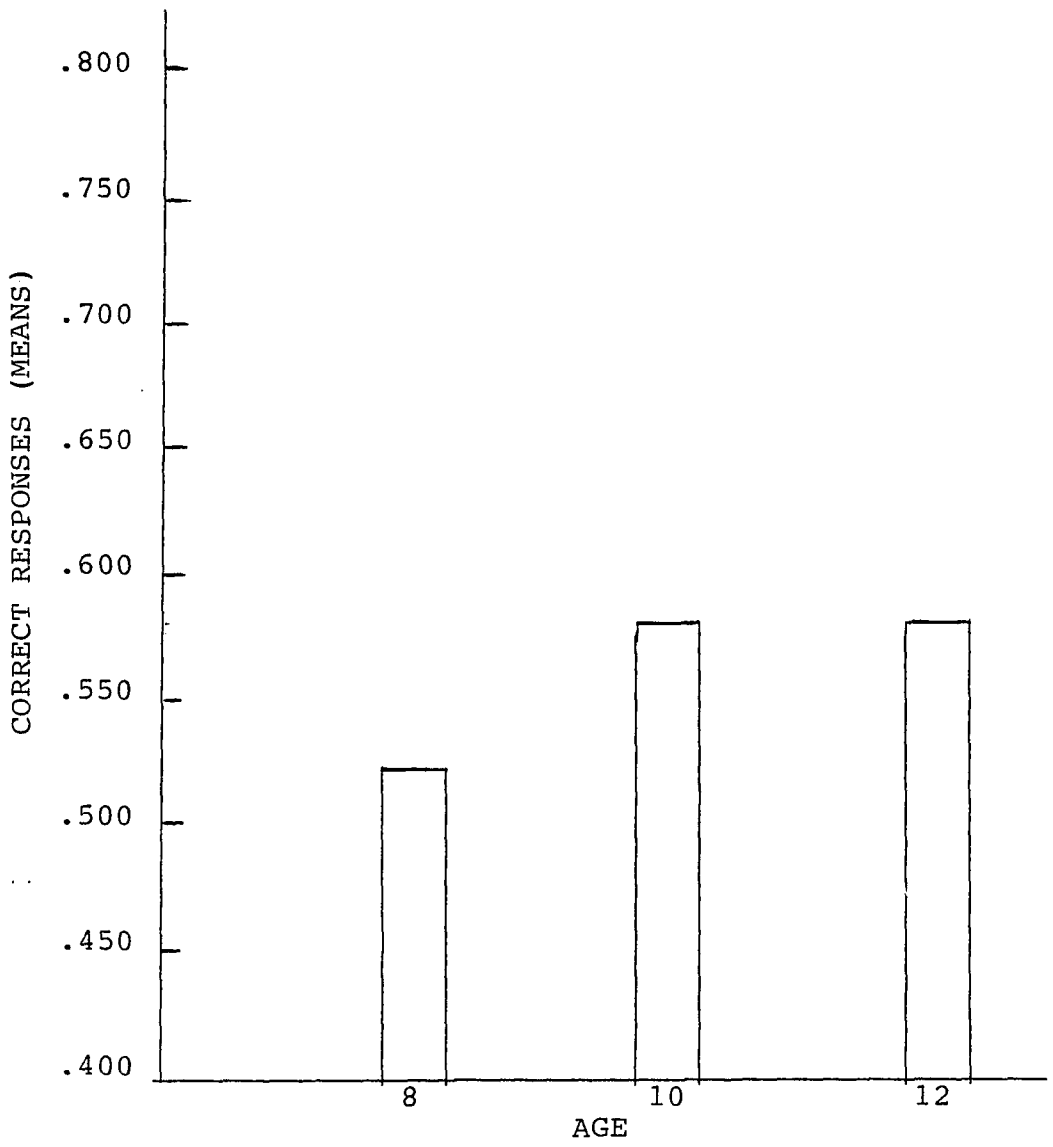

Figure 5. Correct responses (means) for the learning disabled subjects at three ages.

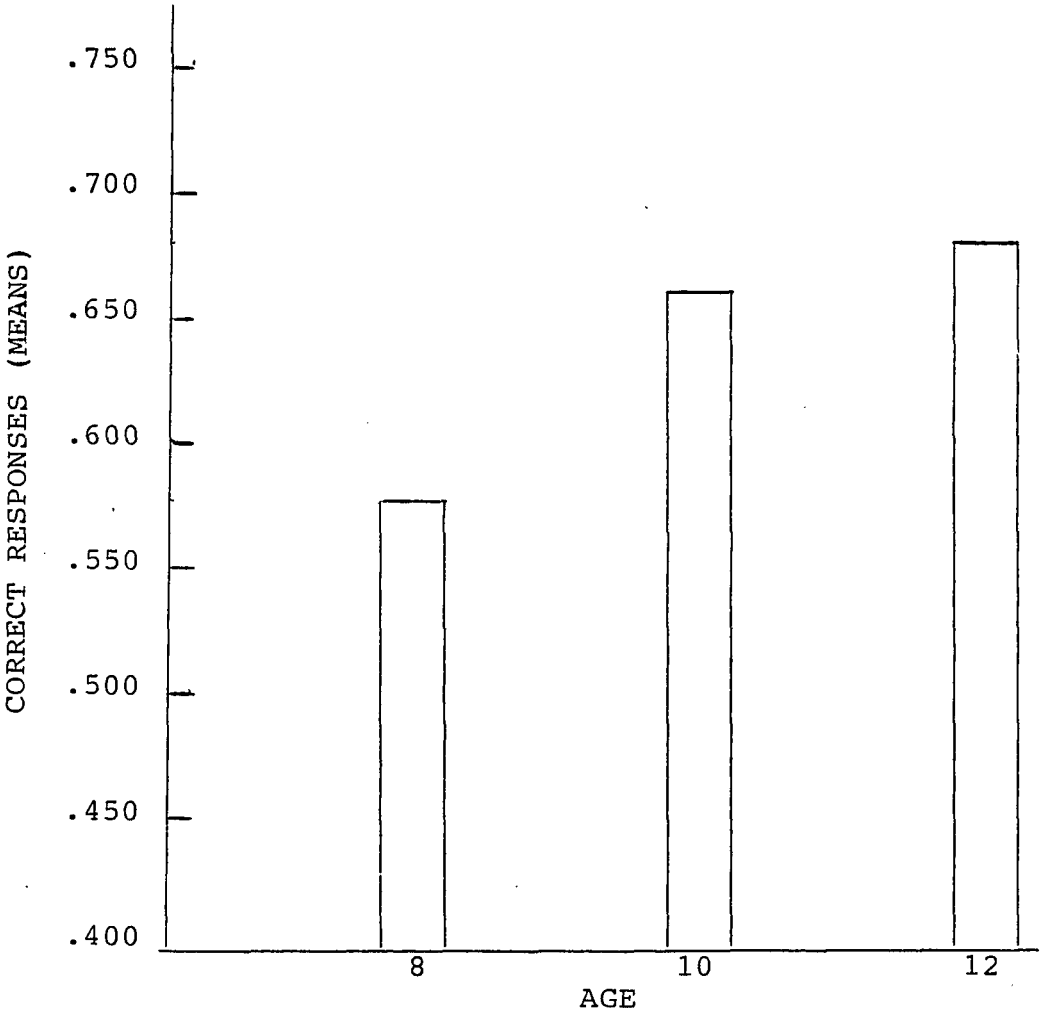

Figure 6. Correct responses (means) for the normal (N_1) and learning disabled subjects at three ages.

in the LD subjects (Figure 5). However, when correct response means were calculated across type and without the six year olds (Figure 6), a significant difference was found between the eight year olds and the older subjects (Scheffee, $P < .01$).

There was no significant age x hint interaction when the data of the N_1 and LD subjects were combined and analyzed across type. However, age x hint was significant for the N_2 subjects $F(9,96) = 7.304$, $P < .001$ (See Table 9). The age x hint interaction is shown in Figure 7. While no significant differences were found between the ages at HL I and HL II, there were significant differences between the youngest subjects and the other subjects at HL III and HL IV. Furthermore, eight year olds performed significantly poorer than twelve year olds at HL IV (Tukey, $P < .05$).

Subject Type: Normal (N_1) vs. Learning Disabled (LD)

The performance of the LD children was poorer than the N_1 children only at certain hint levels and ages. A hint x type interaction was significant $F(3,144) = 7.307$, $P < .001$ (See Table 10). The correct responses (means) for the N_1 and the LD subjects at the four hint levels is shown in Figure 8. The N_1 subjects performed significantly better than the LD subjects at HL III and HL IV. A hint x type x age interaction was also significant $F(6,144) = 3.628$, $P < .003$.

Hint Levels

Age

	1	2	3	4
six	.867	.650	.183	.150
eight	.800	.817	.450	.467
ten	.933	.750	.667	.633
twelve	.833	.833	.650	.800

Table 9. Correct responses (means) for the normal (N_2) subjects at four ages and four hint levels.

	Hint Level			
	I	II	III	IV
Type				
N_1	.865	.800	.589	.633
LD	.822	.694	.394	.328

Table 10: correct response means for the normal (N_1) and learning disabled (LD) subjects at four hint levels. A hint x type interaction is significant ($P < .001$).

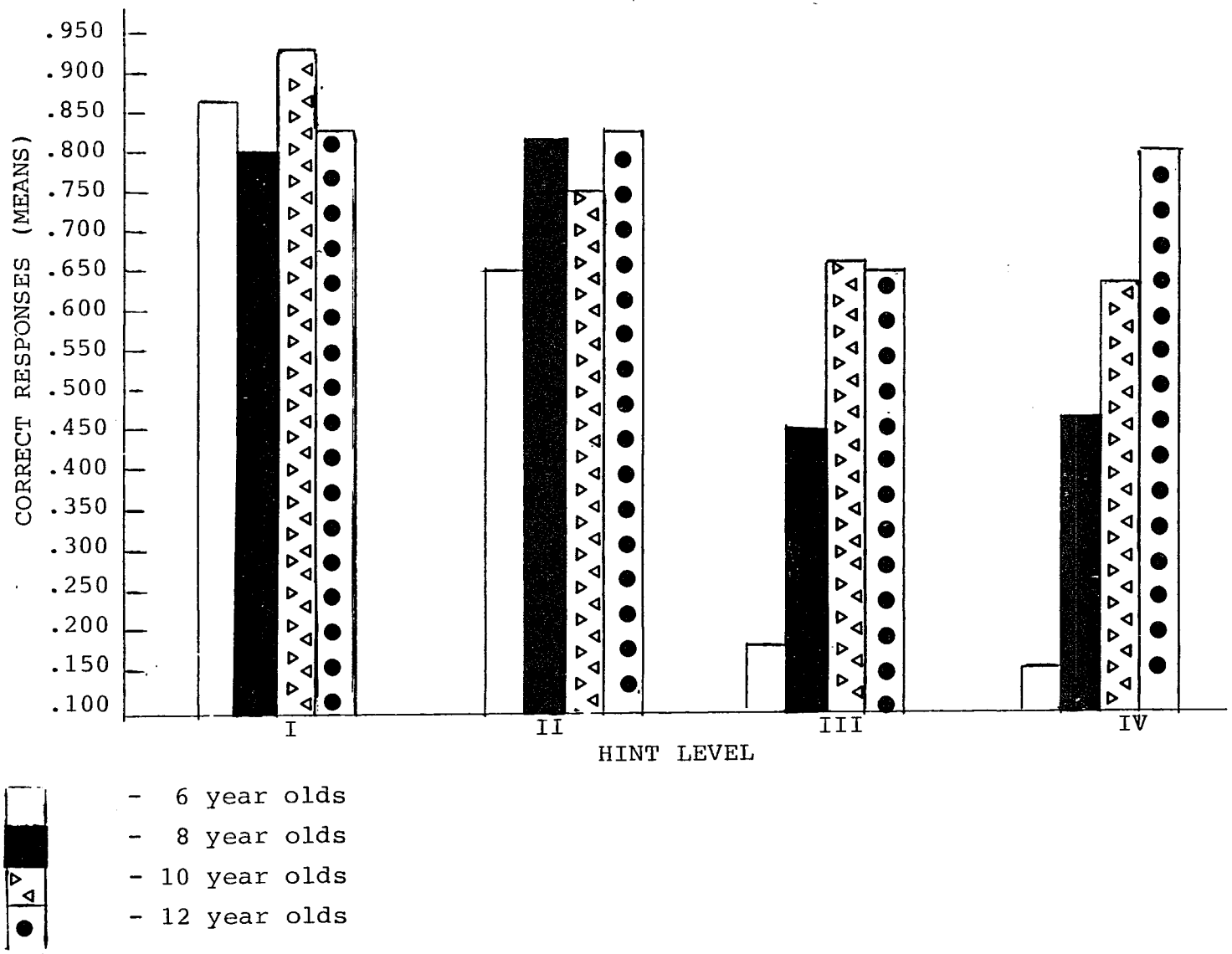

Figure 7. Hint x age interaction for the normal population (N_2).

Figures 9-11 present a comparison of the correct responses (means) for the three ages of the N_1 and LD subjects at the four hint levels. There was no significant difference between the N_1 and LD eight year olds at any of the hint levels (Figure 9). Significant differences between the N_1 and LD subjects were found for the ten year olds at HL III (Figure 10) and for the twelve year olds at HL IV (Figure 11) Tukey, $P < .05$ (Response means for the three ages of the N_1 and LD subjects at four hint levels are in Appendix C).

Different patterns of correct responses for the N_1 and LD subjects at different ages emerged. Table 11 and Figures 12a and 12b present these different patterns. The eight year old N_1 subjects performed significantly better on the HL I and HL II than on HL III and HL IV. The ten year old N_1 subjects performed significantly better on HL I than on HL IV. There were no significant differences among hint levels for the twelve year old N_1 subjects (Tukey, $P < .05$). Thus for the N_1 subjects, the differences among hint levels appear to decrease as age increases until, at age twelve, there are no differences between hint levels. This pattern of responding does not correspond to that of the LD subjects. At all ages, the LD subjects' performance at HL I and/or HL II was significantly better than HL III and/or HL IV. There was no decrease in differences

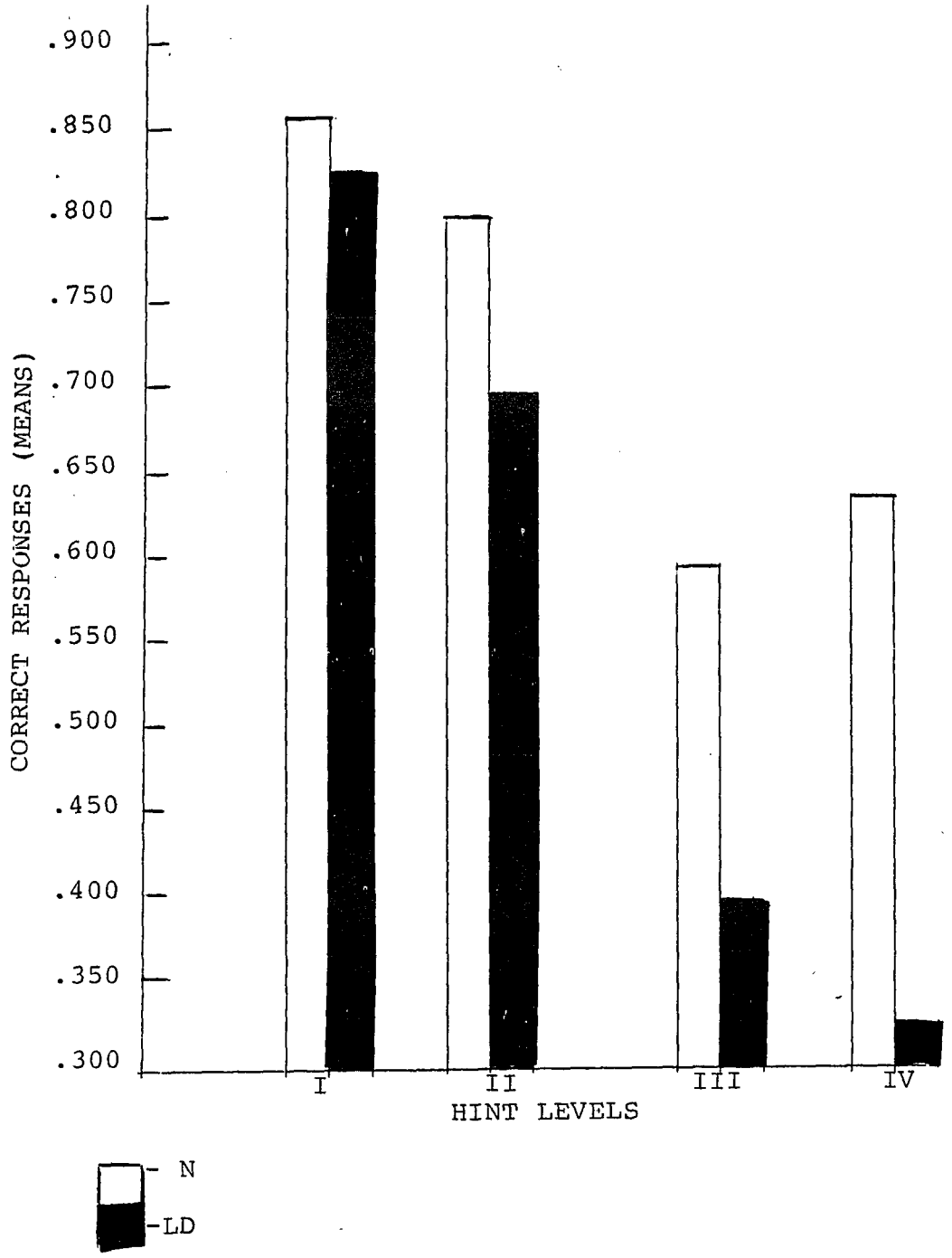

Figure 8: Correct responses (means) for the normal (N_1) and learning disabled (LD) subjects at four hint levels.

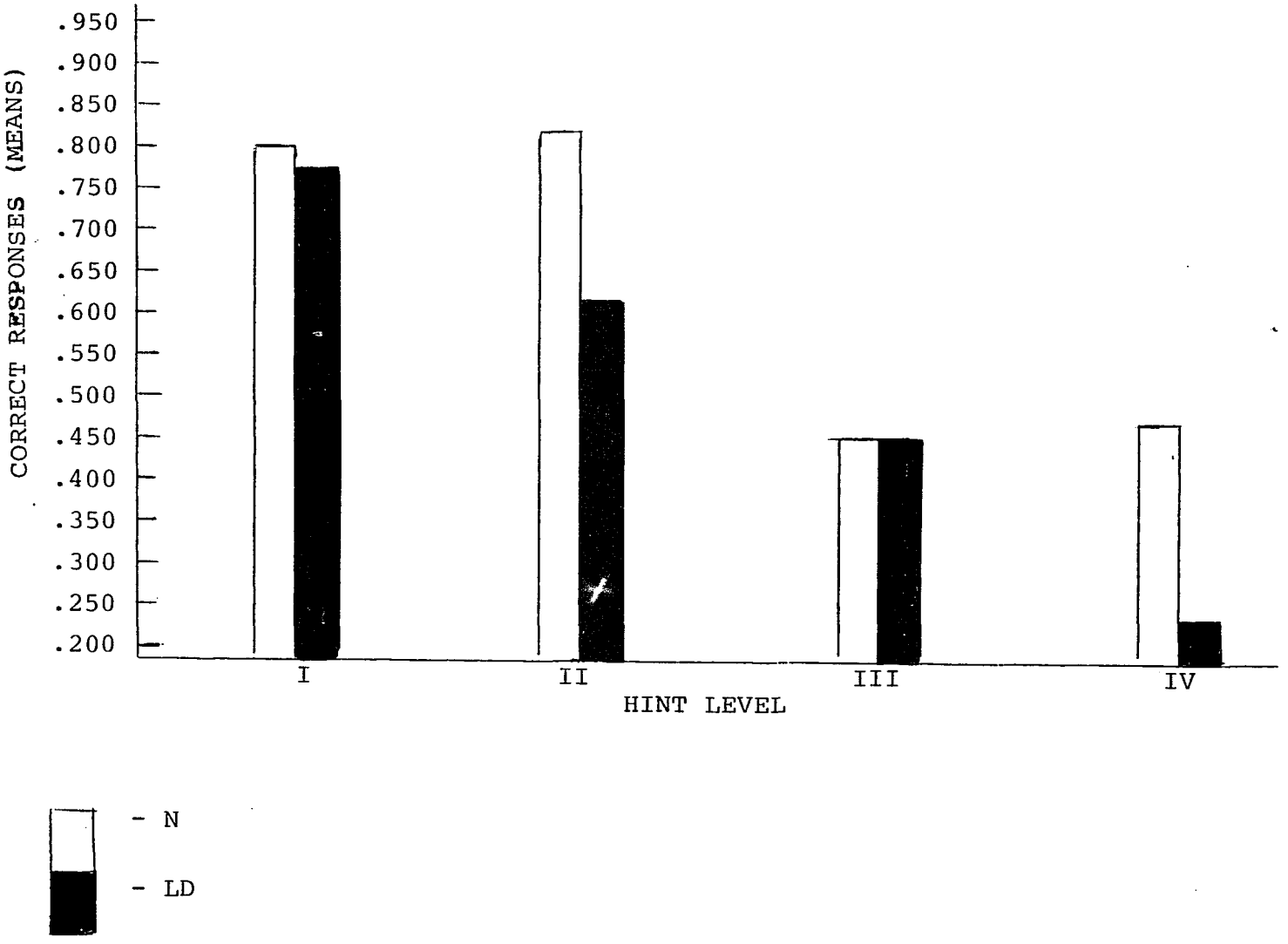

Figure 9. Correct responses (means) for the 8 year old normal (N) and 8 year old learning disabled (LD) subjects at four hint levels.

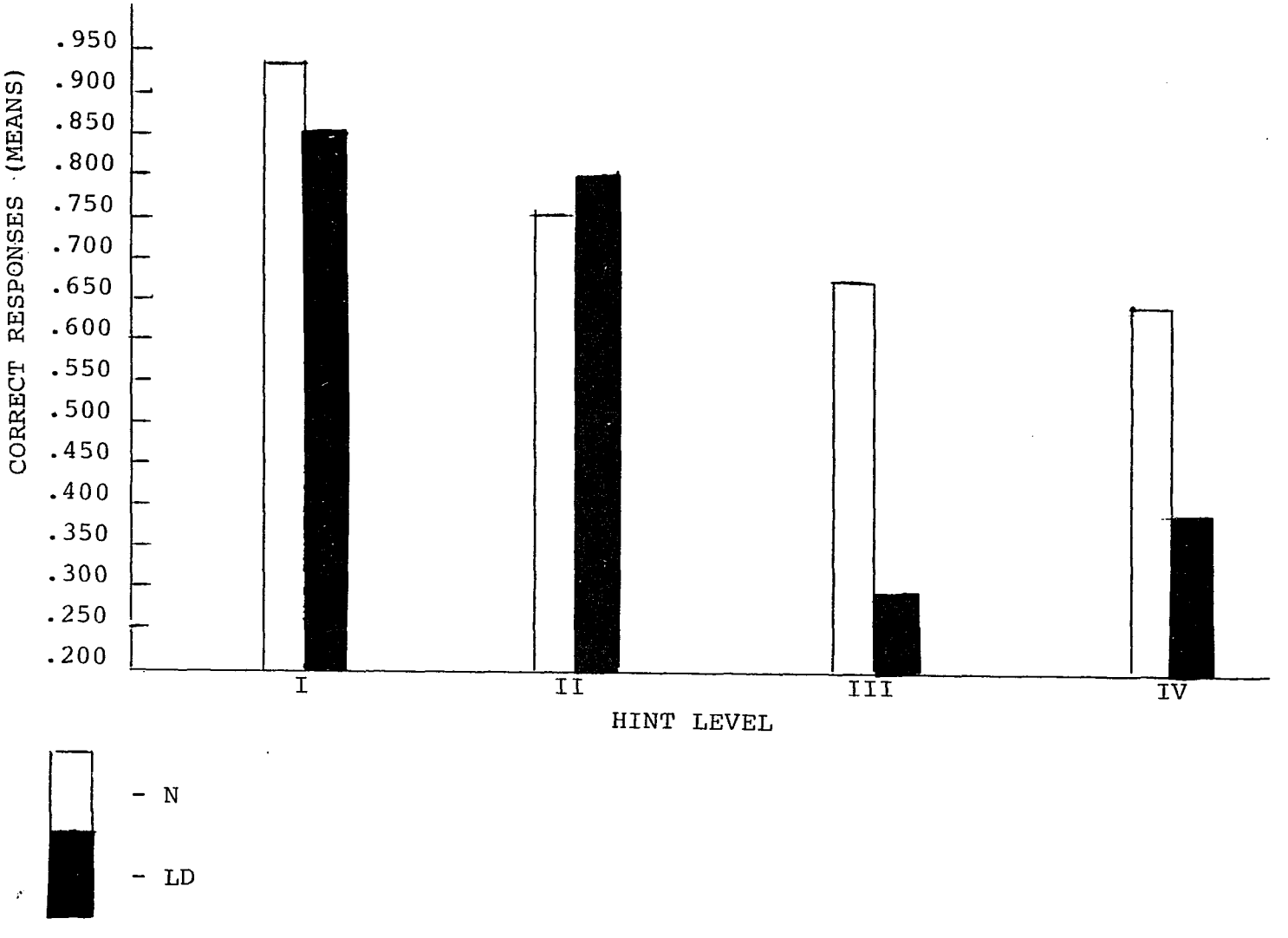

Figure 10. Correct responses (means) for the 10 year old normal (N) and 10 year old learning disabled (LD) subjects at four hint levels.

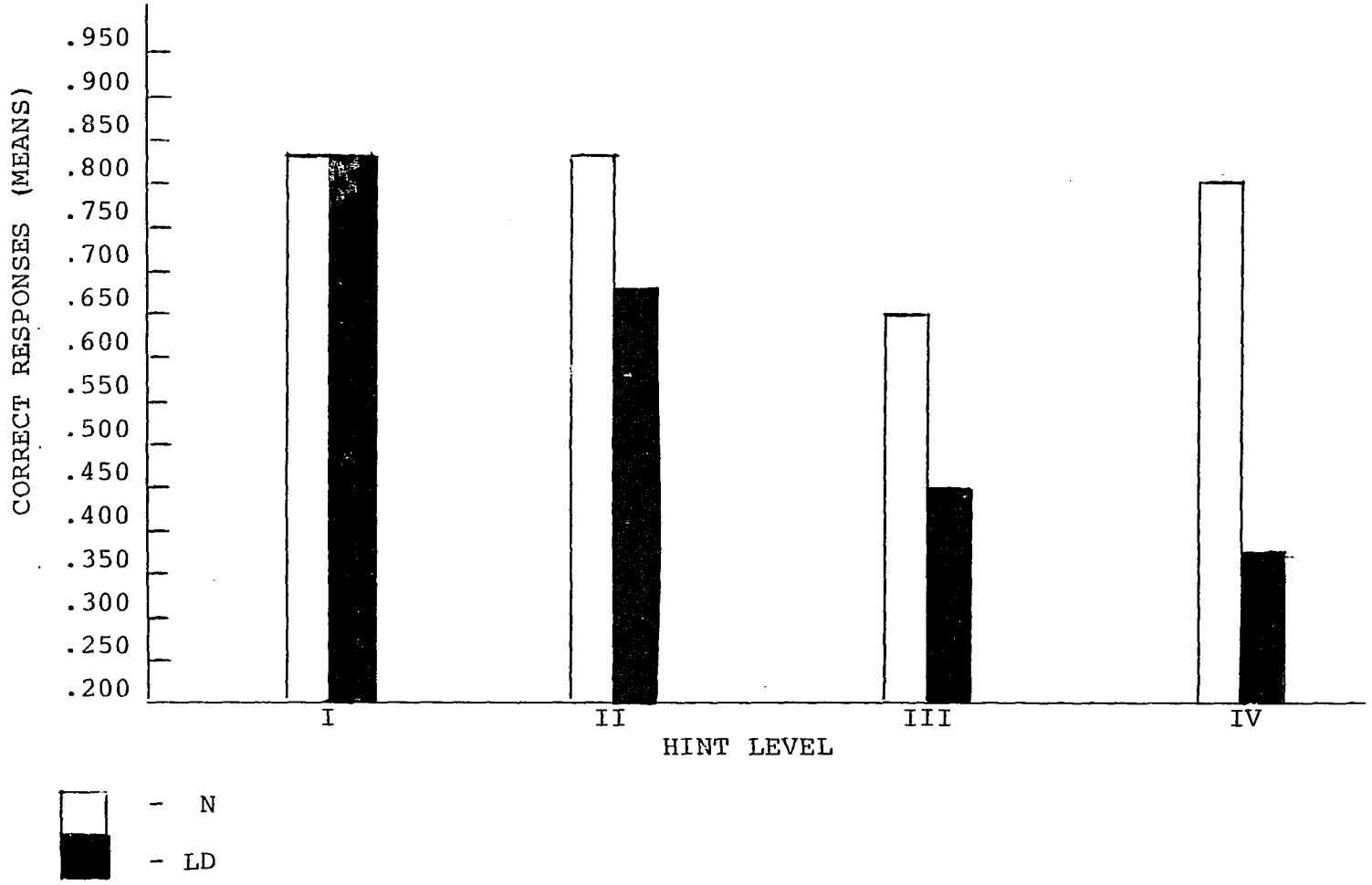

Figure 11. Correct responses (means) for the twelve year old normal (N) and the twelve year old learning disabled (LD) subjects at four hint levels.

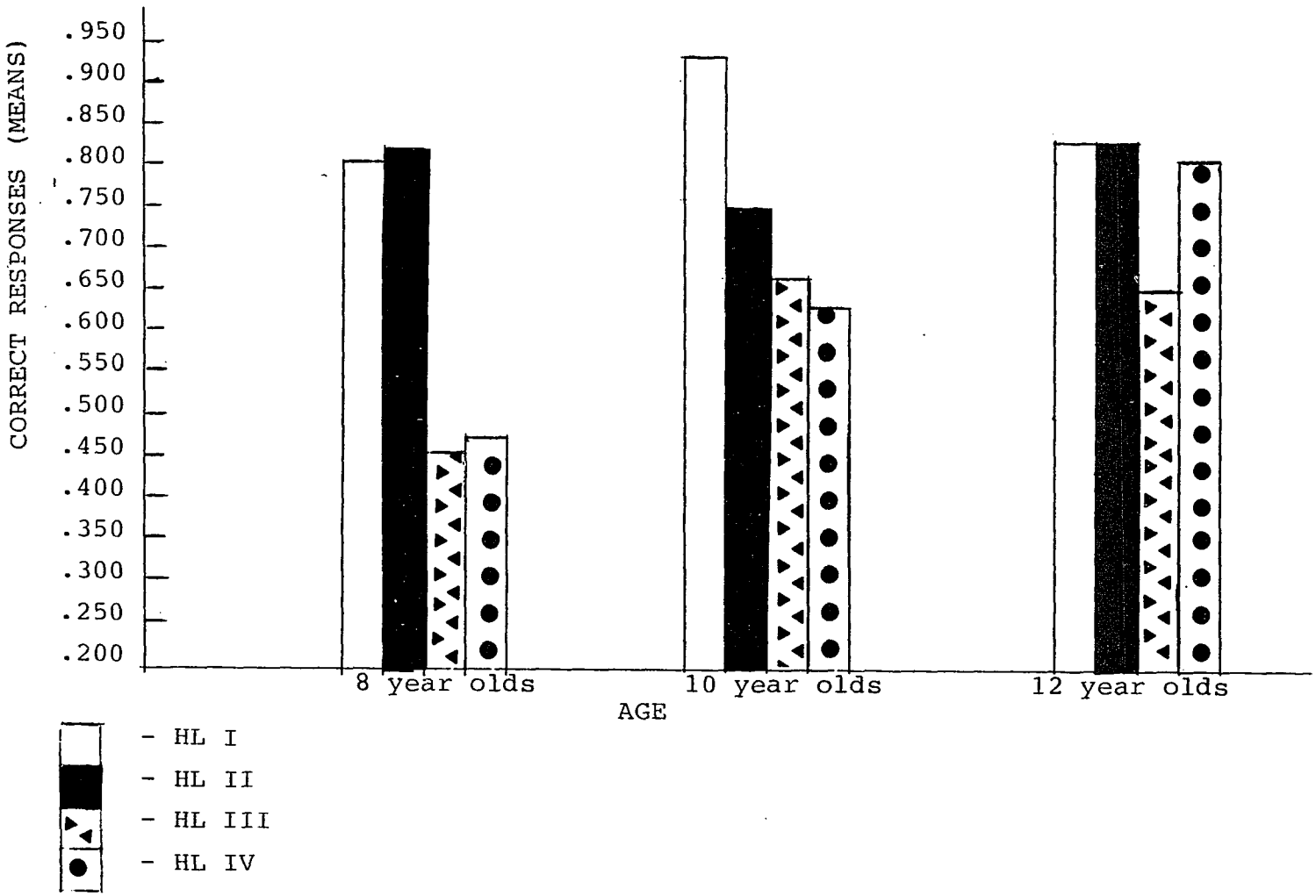

Figure 12a. Hint x type x age interaction for the normal (N_1) subjects.

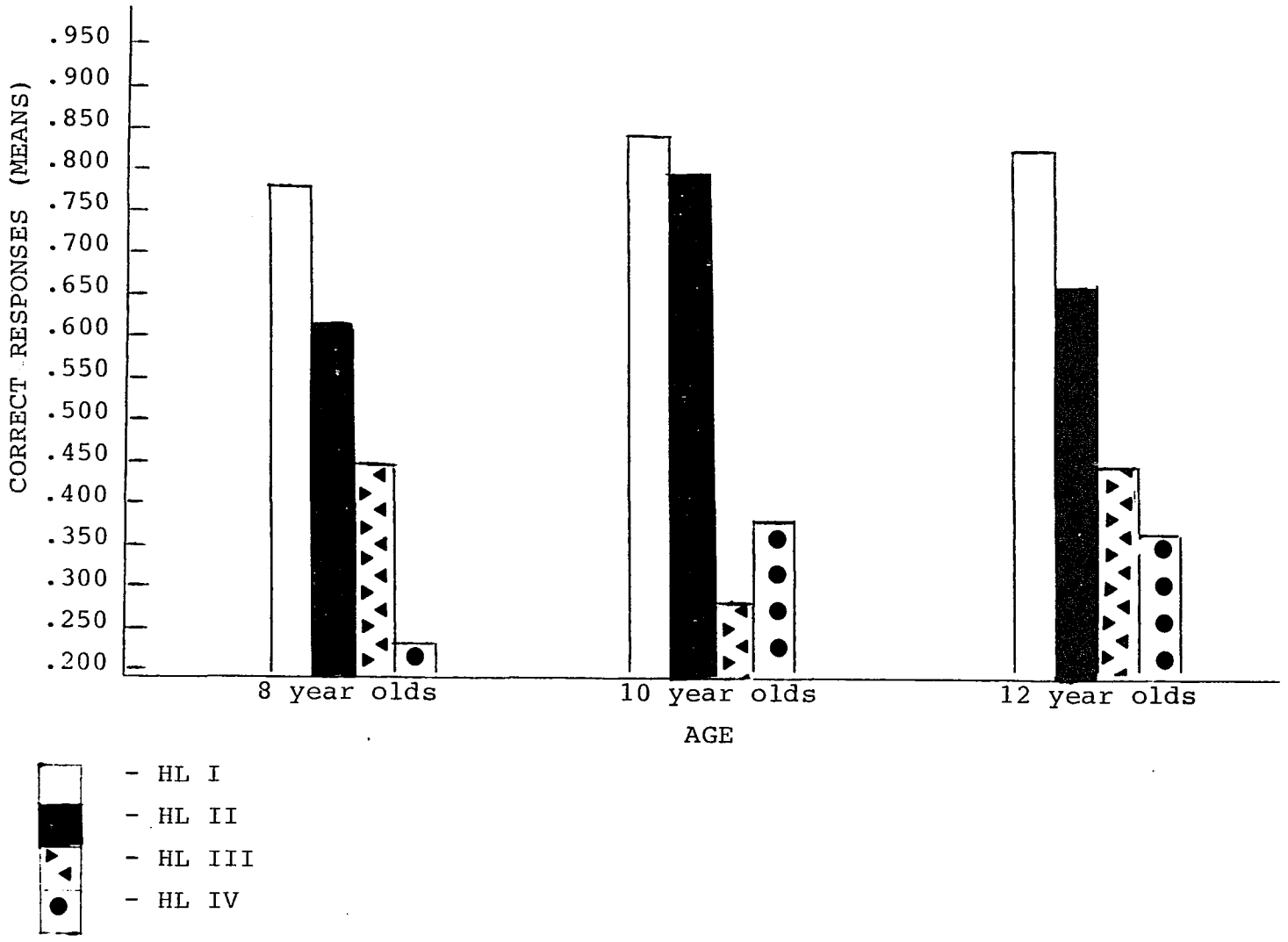

Figure 12b. Hint x type x age interaction for the learning disabled subjects.

	Type	
	N	LD
Age		
8	HL I and HL II better than HL III and HL IV.	HL I and HL II better than HL IV. HL I better than HL III.
10	HL I better than HL IV.	HL I and HL II better than HL III and HL IV.
12	No differences between hint levels.	HL I better than HL III. HL I and HL II better than HL IV.

Table 11: Patterns of significant differences (Tukey, $P < .05$) between hint levels within each age for the normal (N_1) and learning disabled subjects.

among hint levels as age increased. Furthermore, as noted above (See Age and Figure 7), the twelve year old N_1 subjects performed significantly better than the eight year old N_1 subjects at HL IV (Tukey, $P < .05$). There were no significant differences among ages in the LD children.

Hint awareness: Table 12 presents the number of normal and learning disabled children who verbalized an awareness of the hint. In the N_2 subjects, only one six year old overtly indicated such an awareness, while eleven twelve year olds indicated this awareness. The eight and ten year old subjects also indicated this awareness but to a lesser extent than the twelve year old group. In the LD subjects, only three twelve year olds indicated any hint awareness.

Verbalizations

Some children included verbalizations in their responses (See Methodology, Classification of Responses above). These inclusions appeared to reflect other linguistic skills that the child possessed (storytelling or social awareness of a "polite" response when responding to a request.).

The number of correct and/or incorrect responses which included verbalizations was tabulated (See Table 13). In the N_2 subjects, no verbalizations occurred for the six year olds, a slight increase was evident

	Age	Number of children	Percentage
NORMALS	6	1	8
	8	8	66
	10	5	42
	12	11	91
LEARNING DISABLED	8	0	0
	10	0	0
	12	3	25

Table 12. Number of children at each age who expressively indicated awareness of hint.

	Age	Number of children	Percentage
NORMALS	6	--	--
	8	29	12
	10	25	10
	12	9	3
LEARNING DISABLED	8	8	3
	10	9	3
	12	20	8

Table 13: Number and percentage of responses (correct and incorrect) with a "verbal element."

for the eight and ten year olds and a decrease occurred for the twelve year olds. The data for the LD subjects do not reflect the increase seen in the normal population.

Probes

Table 14 presents the proportion of probes which resulted in a change of response on the part of the subject. While the six, eight and ten year olds appear to change their responses equally from correct to incorrect and from incorrect to correct, there is a notable decrease for the twelve year olds for changes from correct to incorrect (and a concomitant increase in changes from incorrect to correct). This decrease is not noted in the LD subjects.

Groups and Stories

A significant group (presentation) x hint interaction, $F(9,144) = 5.512$, $P < .001$ and group x age x type interaction, $F(6,48) = 2.446$, $P < .03$ was reported. Figures 13 and 14 present the correct responses (means) of the groups at different hint levels for the N_1 and LD subjects and the N_2 subjects. While no formal analysis of the means was done, it appears that the Group C mean at HL I is depressed for the N_1 and LD subjects and N_2 subjects. The group D mean at HL III and the Group A mean at HL IV appear to have high levels of correct responses. It appears, therefore, that the hints at each level were not always of equal difficulty

Response Change

	Age	/ --- x (correct to incorrect)	x --- / (incorrect to correct)
NORMALS	6	.03	.02
	8	.04	.03
	10	.01	.01
	12	.01	.04
LEARNING DISABLED	8	.06	.07
	10	.07	.04
	12	.08	.05

Table 14: Proportion of probes which resulted in a change of response (from correct to incorrect or incorrect to correct).

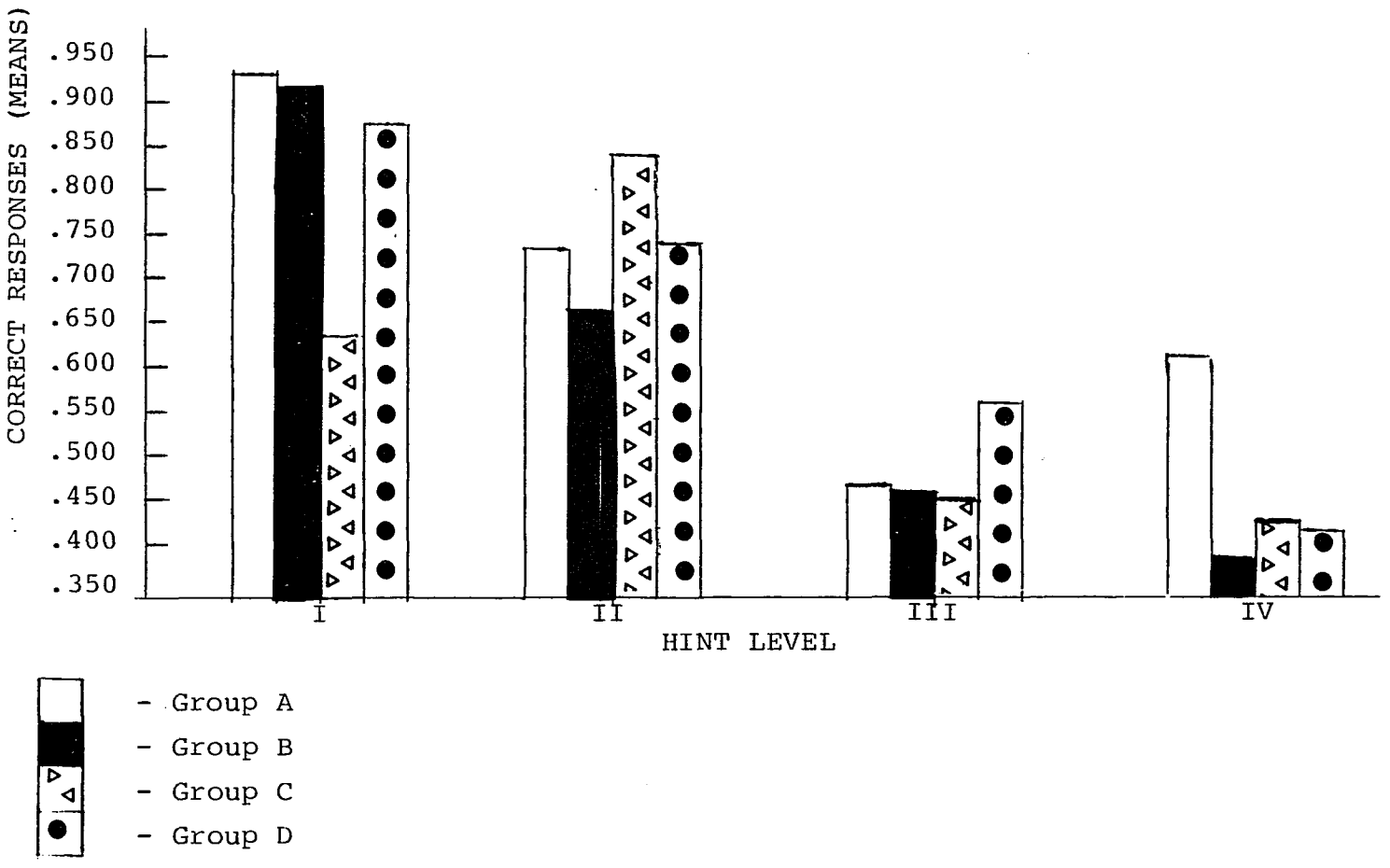

Figure 13. Group x hint interaction for the normal (N_1) and learning disabled subjects (ages 8, 10, 12)

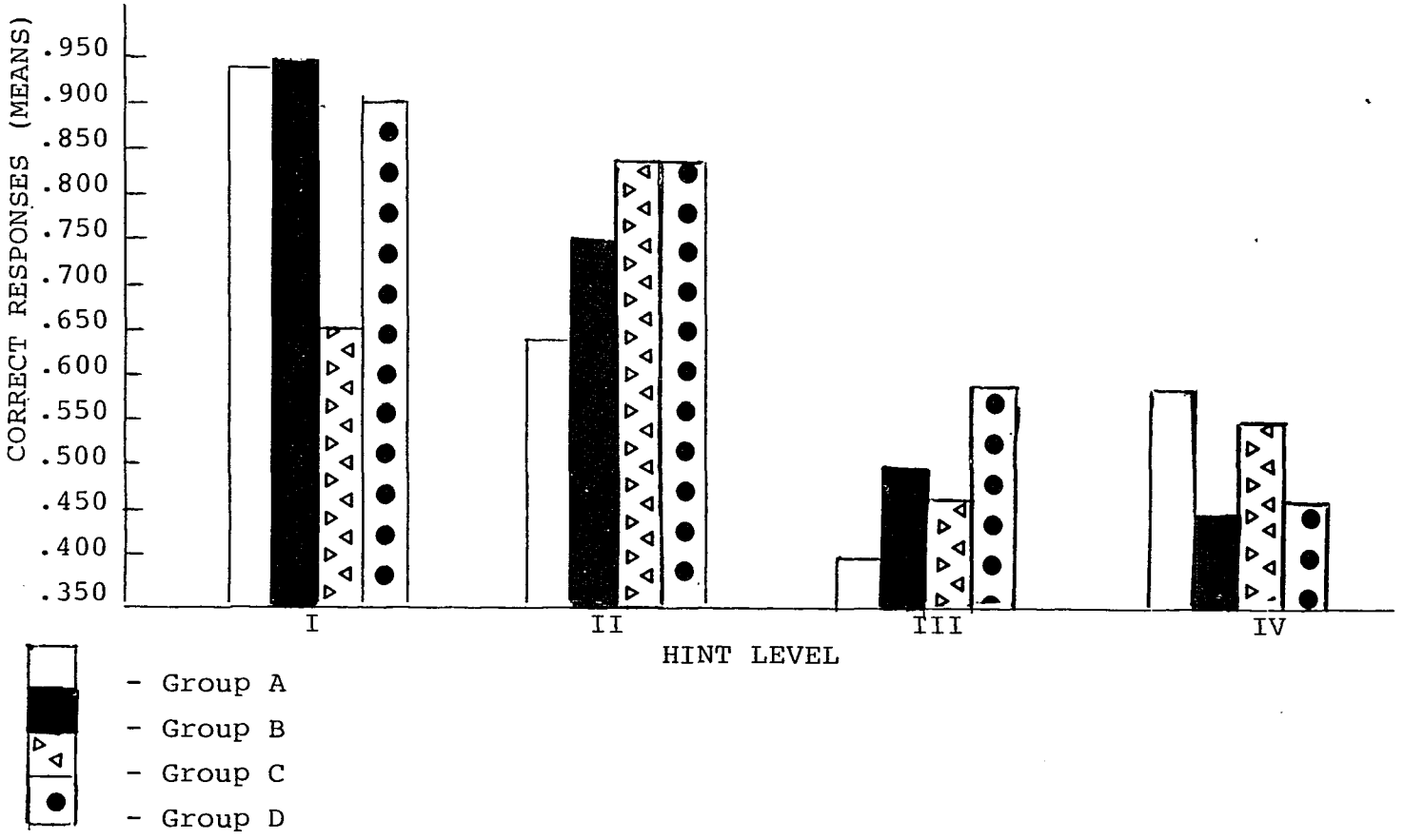

Figure 14. Group x hint interaction for normal population (N_2 - ages 6, 8, 10, 12)

and/or were not uniformly distributed among the groups. Figures 15-18 present the correct responses (means) across all subjects (N_2 and LD) for each hint at the four hint levels. The disparity between the hints is most obvious at HL I (Figure 15). Two of the three hints which have low means (story #7 and story #15) were both in the Group C presentation and are reflected in the depressed score of Group C at HL I. Similarly, Group A at HL IV was presented with hints of stories #4, 8, 12, 16 and 20 - all of which have relatively high means. This is reflected in Group A's high score at Level IV (See Appendices E, F and G for Tables on the type x age x group interaction and the hint x group interaction).

Control Stories

Both the normal and learning disabled subjects responded appropriately to the control stories. The responses indicated a non-directive comprehension of these stories. While most of the stories received a high level of correct responses, one story (#22) received a lower level of correct responses (See Table 15).

Errors

Six of the original error classes were included in the error analysis. The NR (no response) error was included with the 0 (other) error for the Chi square analysis. The X verb error (incorrect with a verbaliza-

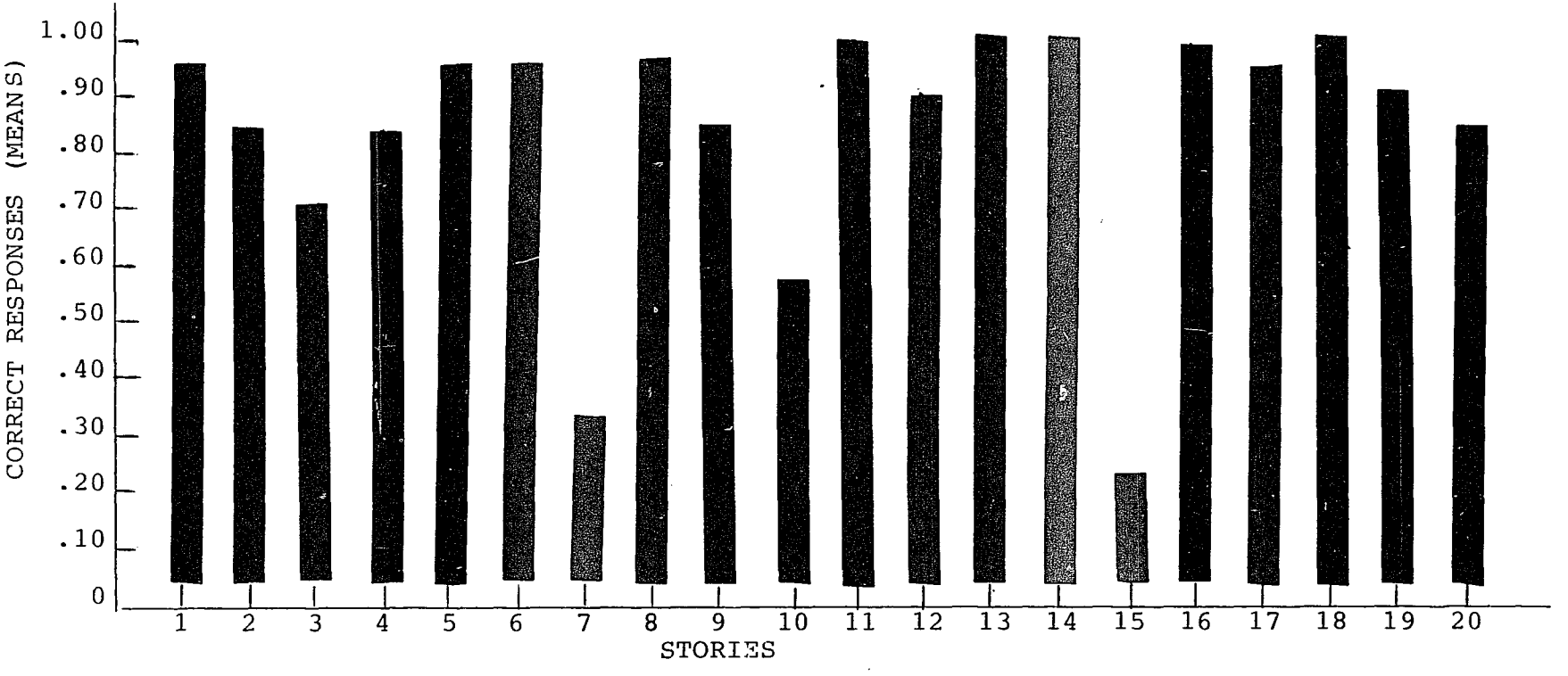

Figure 15. Correct responses (means)for each story: Level I hints.

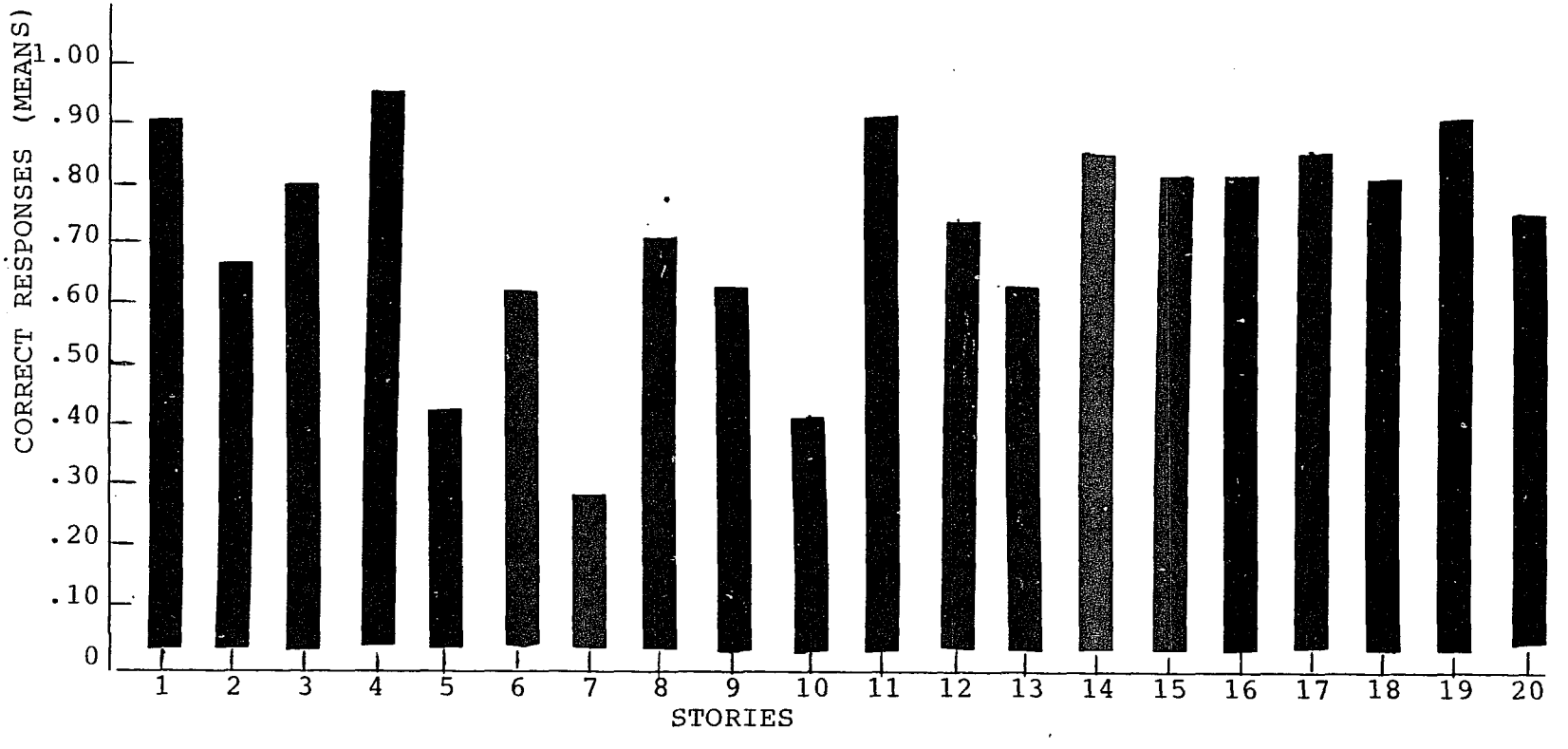

Figure 16. Correct responses (means)for each story: Level II hints.

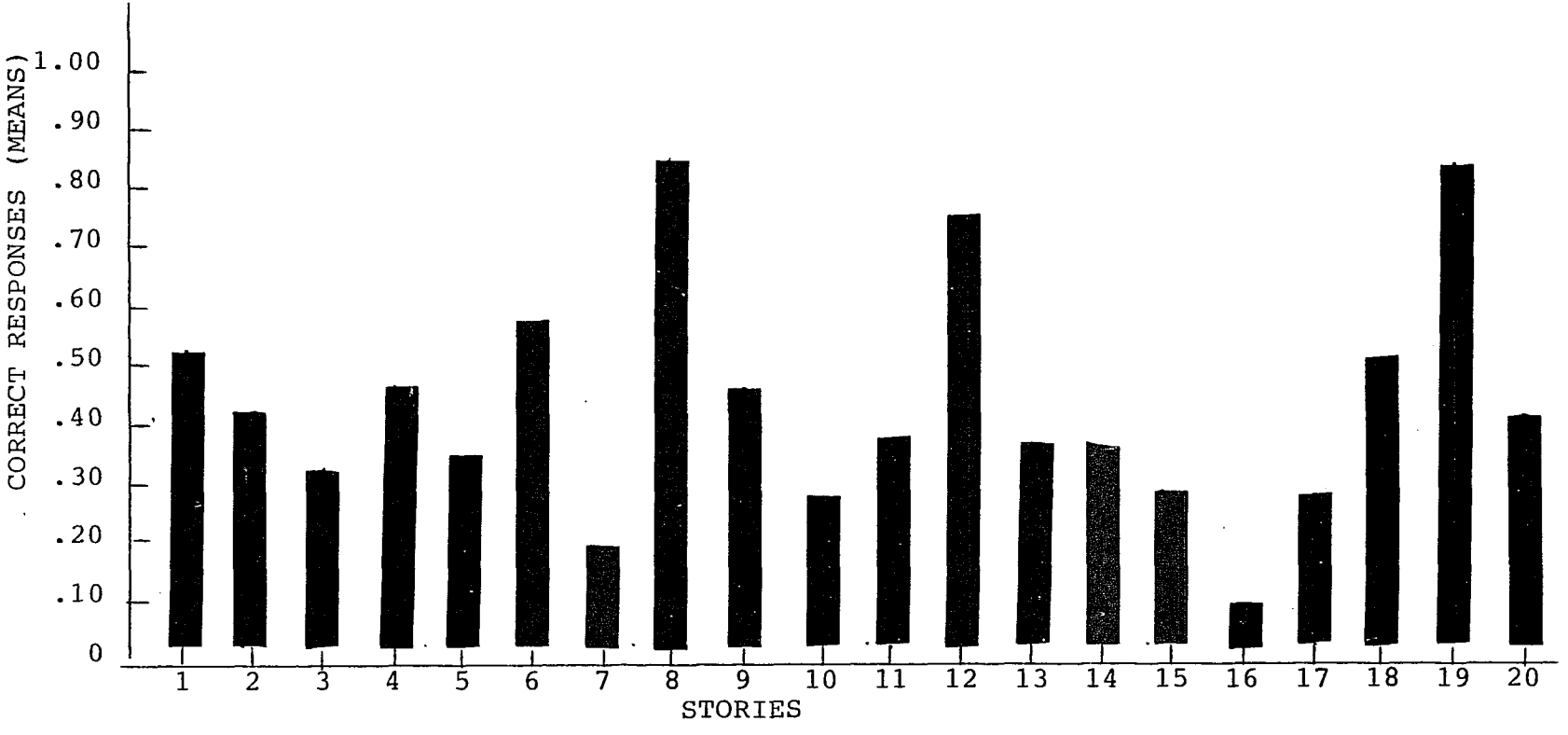

Figure 17. Correct responses (means) for each story: Level III hints.

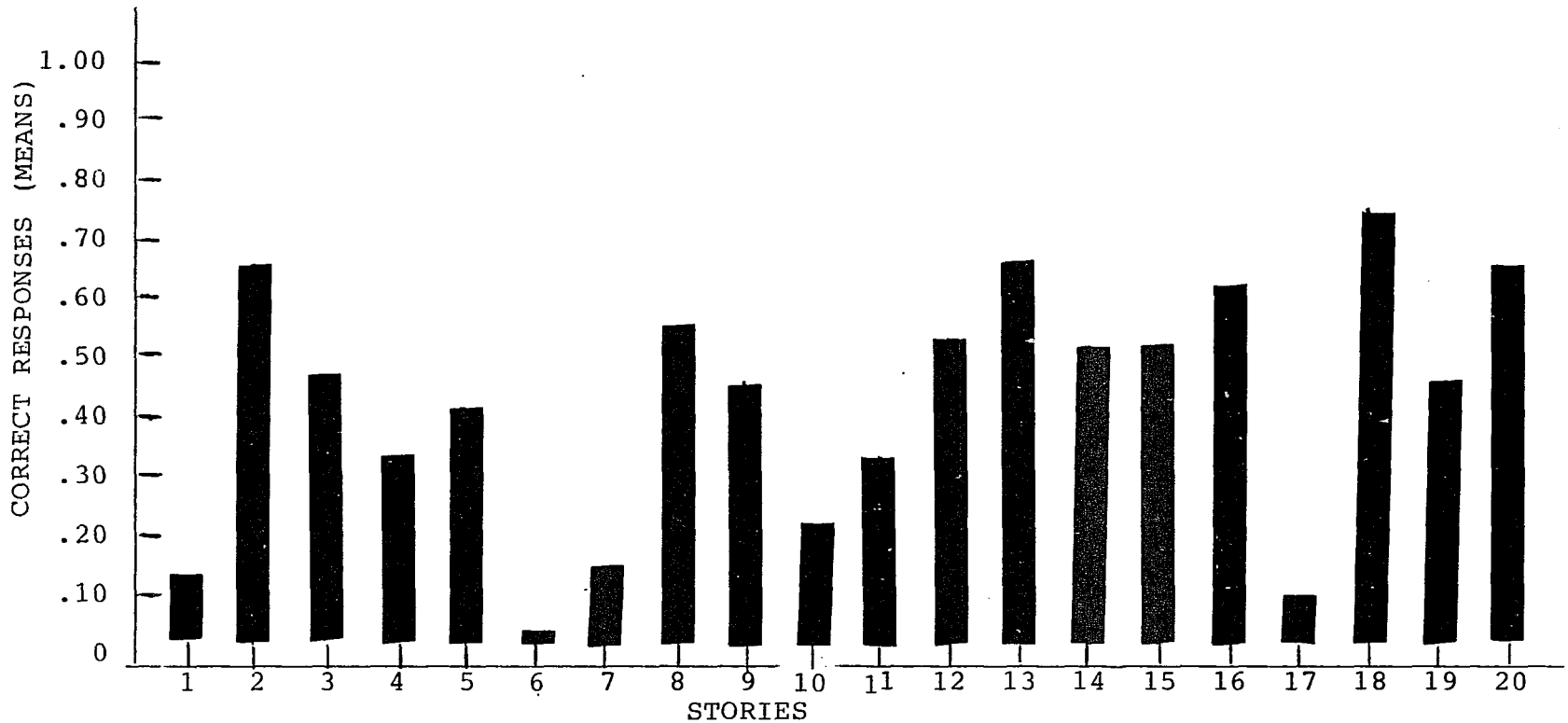

Figure 18. Correct responses (means) for each story: Level IV hints.

NORMAL

Story

Age:	21	22	23	24	25
6	11	9	12	12	12
8	12	11	12	12	12
10	12	9	12	12	11
12	12	11	12	12	12
SUM	47	40	48	48	47

LEARNING DISABLED

Story

Age:	21	22	23	24	25
8	11	11	12	12	12
10	12	11	12	12	12
12	12	9	11	12	10
SUM	35	31	35	36	34

Table 15: Number of correct responses of the normal (N_2) and learning disabled subjects for each of the control stories

tion, X_p error (incorrect but response to probe was correct), and X_{PA} error (incorrect, response to probe correct but did not specify relationship of the hint to the story) were not included in this analysis (See Classification of Errors, Chapter 3). Tables 16 and 17 present the proportion of incorrect responses at each error class for the N_2 and LD subjects as a function of hint level and age. Chi square analysis was performed on the frequencies of responses in each error class (See Appendix H). Significant differences between errors were found for the N_2 subjects at the four hint levels, $X^2(15) = 84.44$, $P < .001$; for the LD subjects at four hint levels, $X^2(15) = 45.8892$, $P < .001$; for the N_2 subjects at four age levels, $X^2(15) = 71.4819$, $P < .001$ and for the LD subjects at three age levels, $X^2(10) = 61.2023$, $P < .001$. In addition, significant differences were found between the N_1 and LD subjects at age eight, $X^2(5) = 20.6806$, $P < .001$, and at age ten $X^2(5) = 27.8198$, $P < .001$. No differences were found between twelve year olds and LD subjects.

Error and hint levels

Error class interacted with hint level and subject type. The normal (N_2) subjects had a large proportion of S/a and X_D errors at HL I and HL II respectively (Figure 19) with very few or no X_A, X_{LA} or O errors, especially at HL I. At HL III and HL IV, there are more ND and X_{LA} errors and fewer S/a, X_D and X_A errors. For the learning disabled subjects (Figure 20) HL I has a large

NORMAL

	ND	S/a	X_A	X_D	X_{LA}	0 + NR
HL I:	.08	.70	.05	.14	---	- - -
HL II:	.15	.25	.05	.35	.19	.11
HL III:	.18	.21	.10	.12	.23	.14
HL IV:	.25	.17	.17	.04	.31	.10

LEARNING DISABLED

	ND	S/a	X_A	X_D	X_{LA}	0 + NR
HL I:	.14	.47	.03	.03	.11	.22
HL II:	.36	.19	.09	.19	.07	.09
HL III:	.23	.18	.16	.07	.21	.20
HL IV:	.18	.14	.15	.07	.27	.18

Table 16: Proportion of errors in each error class for the normal (N_2) and learning disabled subjects at each hint level.

NORMAL

	Errors					
	ND	S/a	X_A	X_D	X_{LA}	0 + NR
Age:						
6	.30	.26	.07	---	.26	.10
8	.17	.28	.11	.16	.20	.07
10	.10	.13	.15	.36	.13	.13
12	.07	.28	.15	.13	.24	.13

LEARNING DISABLED

	Errors					
	ND	S/a	X_A	X_D	X_{LA}	0 + NR
Age:						
8	.42	.17	.12	.03	.17	.08
10	.12	.22	.10	.05	.27	.24
12	.10	.20	.13	.18	.16	.23

Table 17: Proportion of errors in each error class for the normal (N_2) and learning disabled subjects at each age.

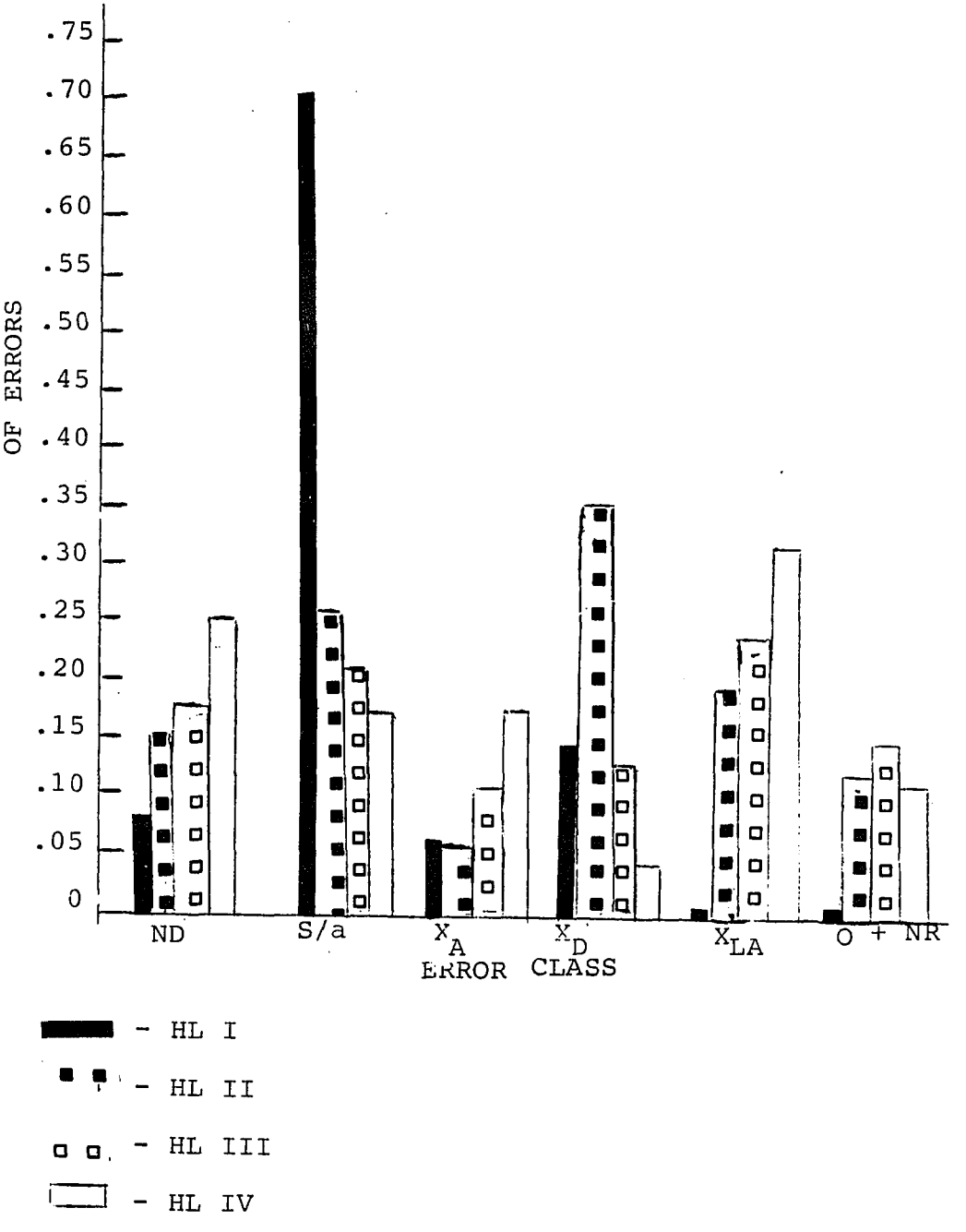

Figure 19. Proportion of errors for each error class at each hint level for the normal (N_2) subjects.

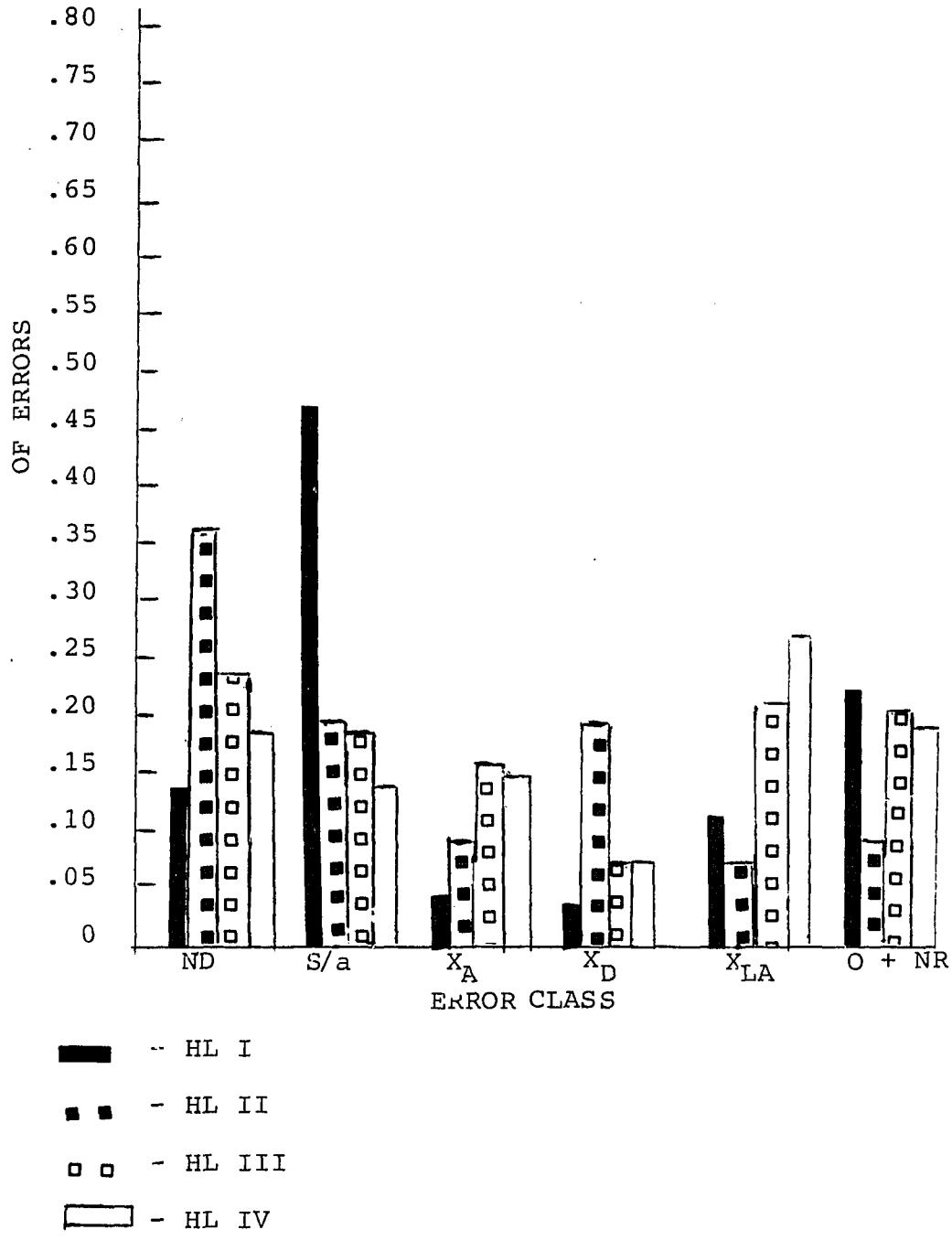

Figure 20. Proportion of errors for each error class at each hint level for the learning disabled subjects.

proportion of S/a errors and HL II has a large proportion of ND errors. Both HL I and HL II have few X_{LA} errors. HL III and HL IV appear to have similar error distributions with error peaks at X_{LA}.

Errors and age

Error class interacted with age. For the normal (N_2) subjects (Figure 21), the six year olds presented no X_D errors and a high proportion of ND and X_{LA} errors. The ten year olds presented a large proportion of X_D errors. The ten and twelve year olds reversed their error patterns for the S/a and X_D error classes. For the learning disabled subjects (Figure 22), there is less spread across error classes at the different ages. The most obvious exception is for the eight year olds where there is a large proportion of ND responses.

N_1 vs. LD subjects

Figures 23-25 present a comparison of the normal (N_1) and learning disabled subjects' errors at different ages. The eight year old learning disabled children made more ND errors than the normals of the same age, while the normals made more S/a, X_D and X_{LA} errors. At the ten year old age, there is a major difference between the normal and learning disabled children regarding most of the error types. The error distributions of the two subject types at the twelve year old age appear to be similar, although small differences still exist, especially for the S/a, X_{LA} and O errors.

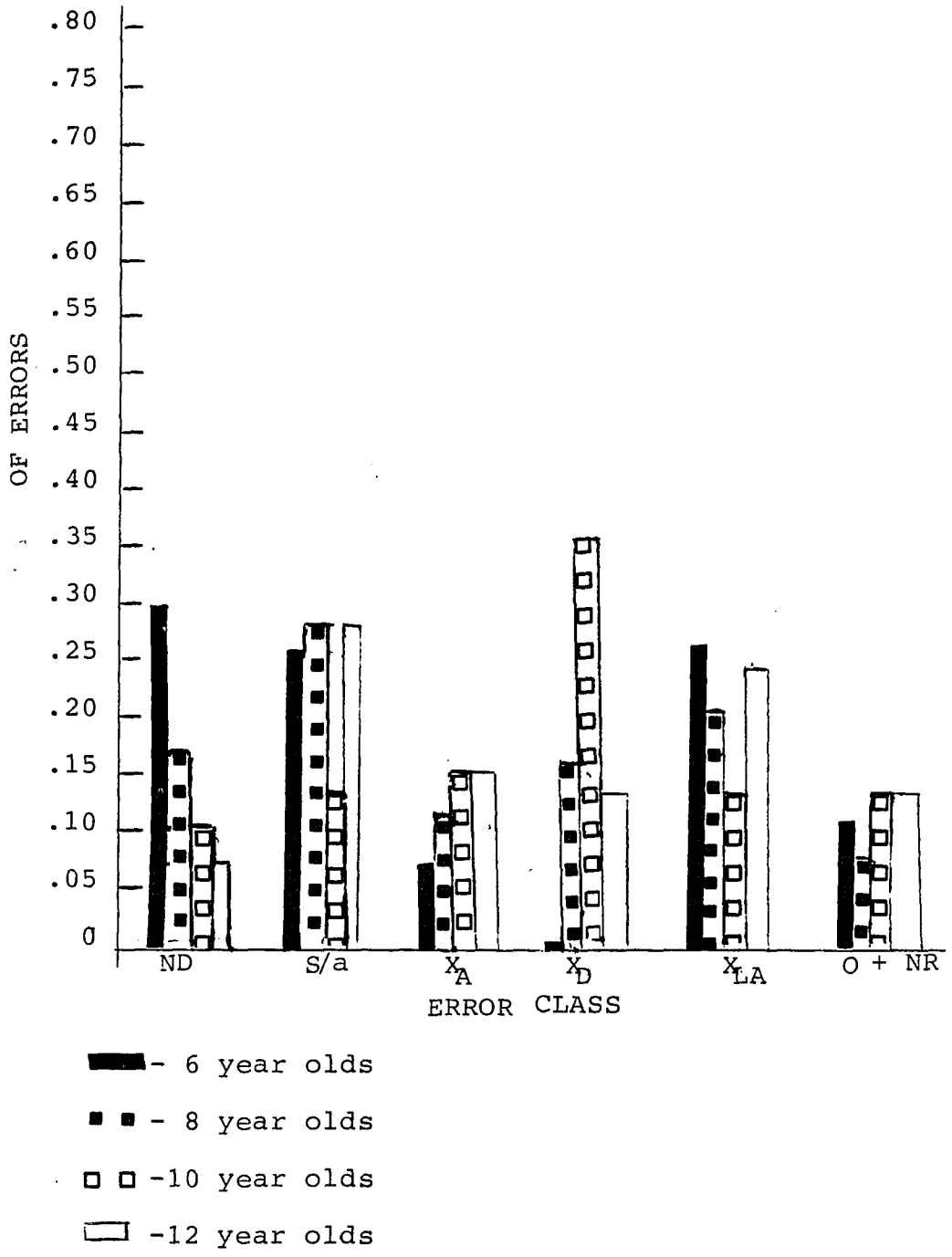

Figure 21. Proportion of errors for each error class at four ages for the normal (N_2) subjects.

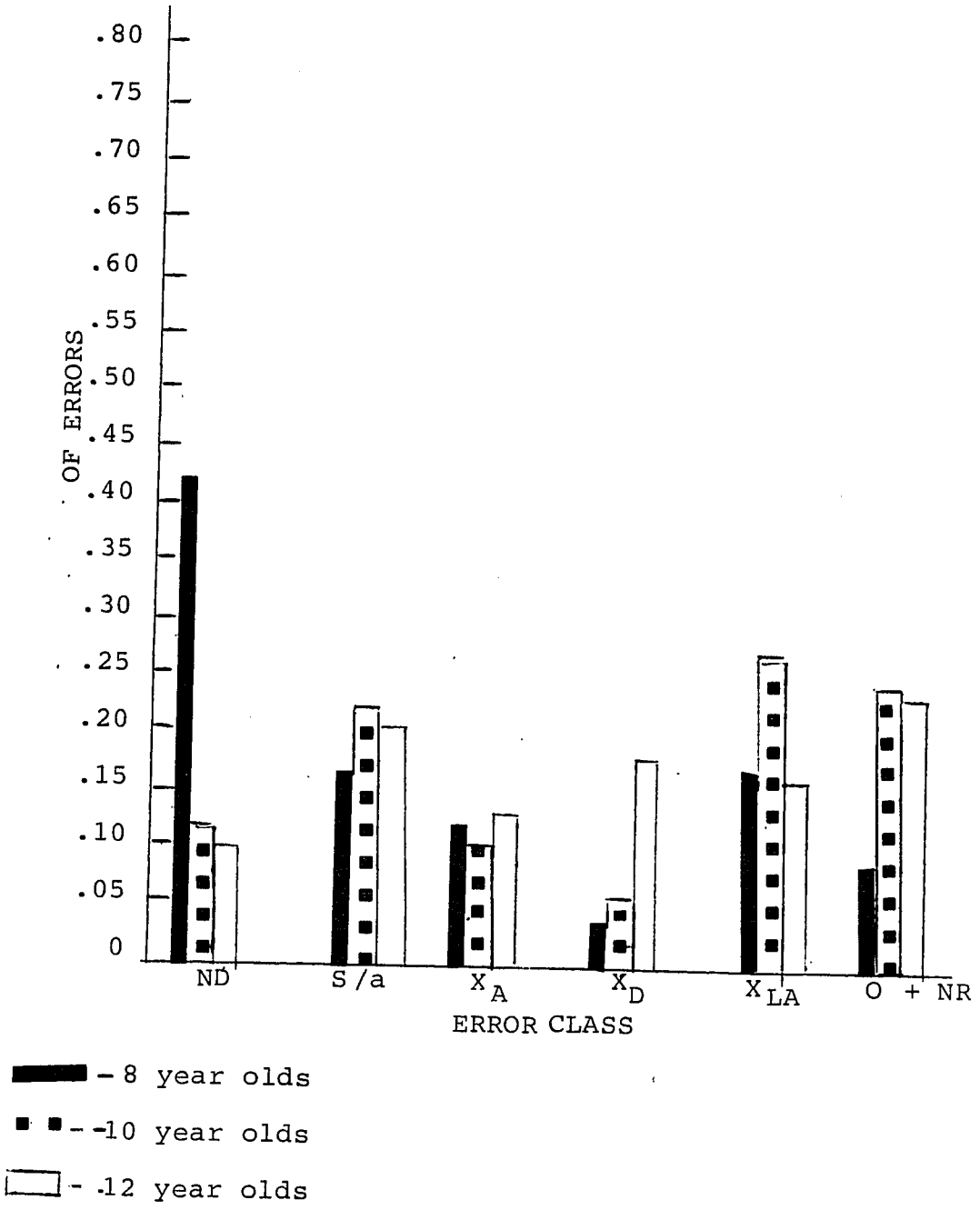

Figure 22. Proportion of errors for each error class at three ages for the learning disabled subjects.

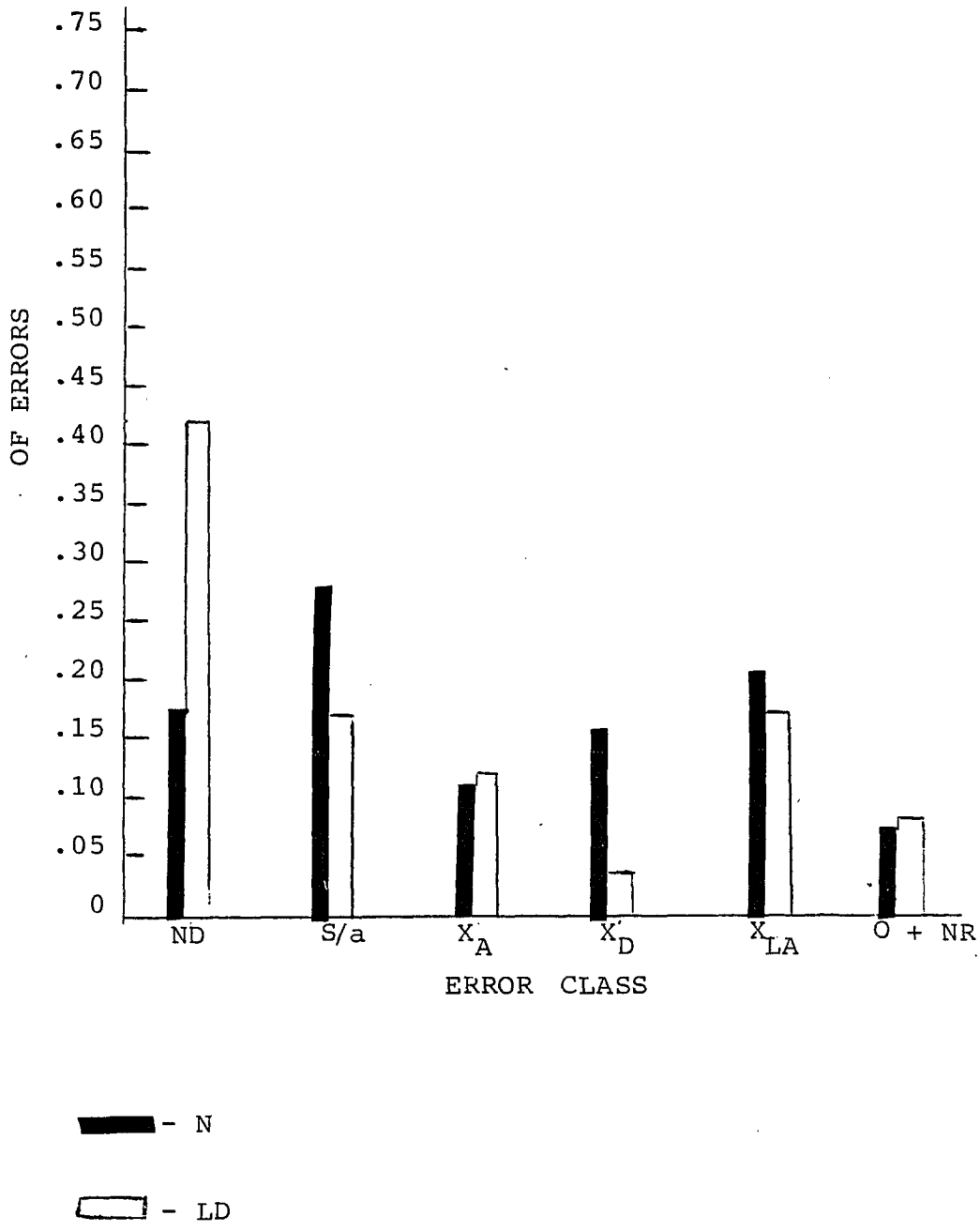

Figure 23. Proportion of errors for the 8 year old learning disabled (LD) and normal (N) subjects.

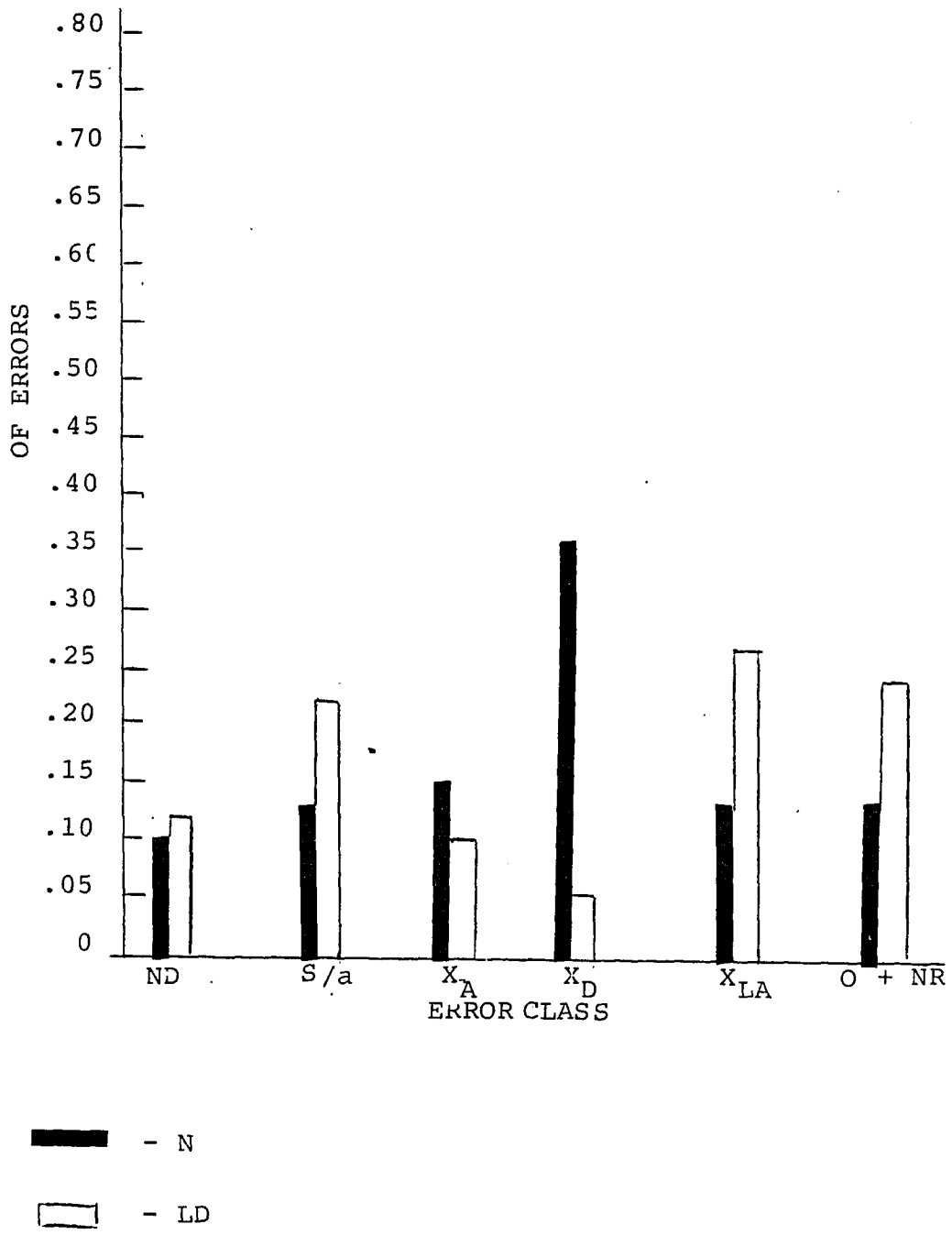

Figure 24. Proportion of errors for the ten year old learning disabled (LD) and normal (N) subjects.

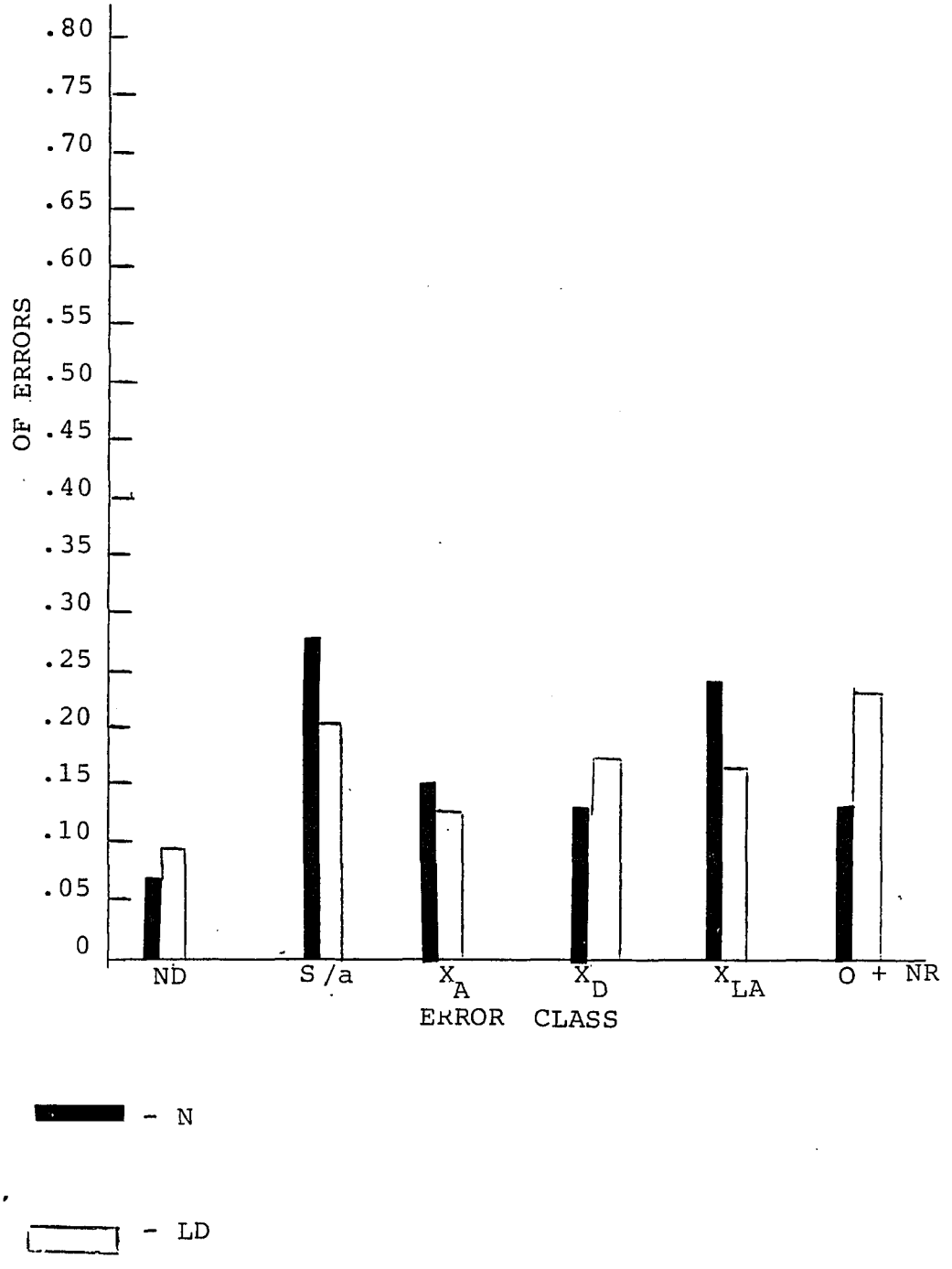

Figure 25. Proportion of errors for 12 year old learning disabled (LD) and normal (N) subjects.

CHAPTER 5

DISCUSSION

In this study, hints at different levels of difficulty were presented to normal and learning disabled children. The children's responses to the hints were considered a measure of their comprehension of the hints. The study was designed to test five hypotheses. All five hypotheses were confirmed by the study.

Hints

The results of this study support hypothesis 1, albeit to a limited extent. The children's responses suggested that need/want statements (HL I) were the easiest to comprehend and hints with humor or absurdities (HL IV) were the most difficult to comprehend. The strongest evidence, however, suggested that the stimuli represented only two levels of hint difficulty, i.e., hint levels I and II contained the easier hints and hint levels III and IV contained the harder hints.

Initially, the explicitness of the hints was varied by omitting some or all of the directive variables--actor, action and goal (see Chapter 3). The results suggest that it is the omission of the object or goal which results in the more difficult hints. There was no direct relationship between the number of directive variables and the ease with which the hint was comprehended.

All the hints at level I and 90% of the hints at level II mentioned the object or goal. (The two exceptions to this at level II were hints in stories #4 and #20. In these two cases, however, the action words which were used related directly to the intended goal.) In contrast to this, the goals were never mentioned in hints at levels III and IV. Thus, the specification of the goal appears to be of great importance in hint comprehension.

Hints at levels I and II referred to the goal or object as well as possibly to the actor and action of the intended directive. Thus, the general theme of the story was maintained. In the more difficult hints (levels III and IV), referents and actions were introduced which were not mentioned in the initial story. The "distance" of the hints from the initial story is related to Grice's (1975) four conversational maxims (see Chapter 2). The hints at levels I and II did not violate any maxims. They were relevant, true, and not obscure or ambiguous. However, the maxim of relation appeared to be violated for level III hints. At hint level IV, the maxim of quality was violated with the inclusion of irony and absurdities. In order to comprehend these hints, the listener must assume cooperation on the part of the speaker, and must determine what the speaker intended to communicate by apparently violating these

maxims.

Poor hint comprehension appears to be related to the absence of the goal in the hint and to Gricean maxim violations. One must therefore account for the inferences which the listener must make in order to comprehend the hints. Clark (1978) states that in comprehending indirect-directive statements, the listener "draws inferences which are limited to those he judges the speaker intended to be drawn" (p. 297). The inferences which the listener draws, according to Clark, are bound by Gricean conversational rules and speech act felicity conditions. Ervin-Tripp (1977) notes that hints typically require inferences. Different kinds of inferences are referred to in the literature. Omanson et. al. (1978) define inferences as follows: "If a narrative is conceived as a chain of events in time, an inference is an activity which is slot filling if it generates an event not explicit in the text and text connecting if it generates relations between events which are depicted expressly in the text" (p. 338). Hildyard and Olson (1978) refer to pragmatic or enabling inferences as necessary to make sense of discourse and include in this category the Gricean conversational implicatures. Paris (1975) introduces lexical and contextual inferences, the latter including "inferred consequences" or inferences which result in "the probable conclusion of a series of statements" (p. 232). Crothers

(1978) distinguishes between proposition inferences, which add new propositions to the text and element inferences, which serve to further clarify a situation which is already explicit.

In this study, only some of the HL I hints necessitated inferencing. Hints which were need/want statements and those which were similar to Ervin-Tripp's (1977) conventionalized directives (e.g., "It's time to go to sleep.") were most probably interpreted quickly and in a routine manner (Ervin-Tripp, 1977; Clark, 1978). The passive statements might have necessitated inferencing to comprehend the actor, e.g. The umbrella should be taken (by you). In Crothers' (1978) system, this would be an element inference. The hints at HL II necessitated enabling, text connecting, or inferred consequence inferences, i.e., inferences which result in text cohesion. The inferences needed at HL II connect two parts of the text and thus appear to be more crucial than element inferences for text comprehension. The difference between these two inference types at HL I and HL II might explain the weaker evidence for a significant difference between HL I and HL II hints.

Hints at levels I and II both referred to the goal or object of the directive as well as possibly to the actor or action. Thus, the general theme of the story was maintained in the hint. The hints at HL III and

HL IV were further removed from the initial story. In these hints, referents and action were introduced which were not part of the original story. These hints also needed enabling or text connecting inferences. However, a greater amount of inferencing or "deeper inferencing" than level II hints was necessary for comprehension of hints at levels III and IV.

There was some weaker evidence suggesting that hints at level III were less difficult than those at level IV. As will be noted later (see normal vs. learning disabled population), ten year old normal and learning disabled children differed significantly in their responses only for hints at level III. The twelve year old normal and learning disabled children differed significantly only for hints at level IV. In addition, patterns of responding for the children at certain ages revealed differences between the easiest hints (HL I) and either level III or level IV hints. Thus, it might be argued that there was a difference between hints at levels III and IV for the normal and learning disabled subjects at certain ages.

One might suggest that a response bias was established and the children automatically responded to all hints as directives. There are two findings which refute this. First, responses to most of the control sentences were appropriate and reflected a "non-directive" compre-

hension of these sentences. For example:

control story: The boy said to his friend "Now I have two pieces [of train track]."

child: Then the boy put the two pieces together and played with his friend.

The responses of the children to the control stories further described the situation but did not specify action on the part of the listener. There was one exception to this. In story #22, the boy says to his father, "That will be a nice bookcase." While the other control stories included expressions of thanks or descriptions of the immediate situation, the above mentioned statement was a compliment. It was understood by some children as a directive. For example:

control story: The boy said to his father, "That will be a nice bookcase."

child: Then the father said, "O.K., I'll make you one too."

The relationship between this speech act and directives should be studied in greater depth in future research.

The second piece of evidence refuting the response bias hypothesis comes from the errors which the children made (see Errors). The errors revealed that even at HL I and HL II, where the request for action appeared

to be more obvious, the children did not necessarily comprehend the hints as directives. There were many responses which indicated a "non-directive" understanding of the hints. For example:

hint: This soup needs salt.

(Please pass the salt.)

child: The soup needs salt.

Thus, the results of both the control sentences and the errors support the position that the children did not automatically respond to each story with an action to a directive.

Alternatively, one might suggest that the children essentially ignored the hints or only partially comprehended the hints, arriving at the appropriate response by comprehending the hint plus the context (story and pictures) or the context alone. It is entirely possible that children responded to well-known contexts rather than to hints, appropriately. For example: In story #8, the boy is jumping on the bed. Since it is known that mothers do not like children to jump on the bed, the subject might respond to this context with "The boy stopped jumping" irrespective of the hints given. This may have happened. Ultimately, this study was concerned with hint comprehension within context and made no attempt to separate out the variables of context vs. hint with regard to comprehension. Some of the

errors made by the children suggested that the children listened to the hints and incorporated the hints with their responses. For example:

hint: The bed is going to break
(stop jumping).

child: The bed broke.

In addition, while responses to hints at HL I and HL II which were correct could have reflected responses to contexts alone, the poor number of correct responses at HL III and HL IV suggest that the hint did influence the child's response. Often, the child's response contradicted the context or ignored the context and only reflected the hint. For example:

hint: I see you're practicing for
your circus job.
(Stop jumping on the bed.)

child: He joined the circus.

An attempt was made during the study to ascertain whether the children did in fact comprehend the actual hints beyond appropriately responding to them. Probe questions were presented to the children after each response. It was assumed that if children truly comprehended the hints, they would respond appropriately to the probe questions and if they did not comprehend the hints, they would respond inappropriately. In fact, this happened in most of the cases. It was further

suggested that if children responded to the context but did not comprehend the hint, probe questions would result in a change of response from initially correct to incorrect (in response to the probes). Alternatively, it was suggested that children who did not comprehend the hints but who responded correctly to the probe questions (thus changing their responses from incorrect to correct), would arrive at the correct response because the probe questions in some way cued them. Since probe questions resulted in very few response changes, one can conclude that the first response given reflected the subject's comprehension of the hints. An alternate explanation, however, is possible. Responding to probe questions necessitates metalinguistic skills. It requires the subject to reflect on the hint and explain it rather than just respond to it. It is possible that the low number of response changes was related to the children's inability to respond to these questions. Many children responded to the probe questions with "I don't know." In those situations where the child's response changed from correct to incorrect, the change might suggest the child's inability to explain the hint rather than non-comprehension of the hint. And, when no change of response occurred--even when the response was correct, the possibility still remained that the child could not explain the

hint. For example:

hint: The store could send a hairdryer.

child: The boy got a towel.

probe: Why did the mother say this?

child: She wanted a towel.

probe: So what happened?

child: He got a towel.

Thus, although in the above example, the response is correct, one cannot say that the child actually explained the hint. (Perhaps if the probe question was "Why did X say it in this way?" , the responses would have included better explanations.)

Thus it appears, that the first response to the hint remains the best measure of the child's comprehension of the hint. The finding that the intended meaning of a hint was at times comprehended in the absence of an explanation of the hint confirms the second part of Hypothesis 3.

In summary then, hint difficulty was associated with the presence or omission in the hint of the target goal; with violation of Gricean maxims and with depth of inferencing which in turn was related to the "distance" of the hint from story. However, there is one other important variable in hint comprehension. Ultimately, hint comprehension is a socio-linguistic phenomenon. In order to comprehend a hint, one must have some

experience with hints. In addition, world knowledge and awareness of society's expectations and social roles are important in hint comprehension. Thus, while the first three characteristics mentioned above are objective measures of hint ease or difficulty, the last characteristic, that of social awareness, is more subjective. Therefore, the answer to the question "Will the hint be understood?" will depend not only on the objective make-up of the hint but also on the listener's prior experiences and social awareness.

Age

Hypothesis 2 is supported, albeit to a limited extent, by the results of this study. The hypothesis was confirmed only for the youngest children when compared with children of other ages and only for the most difficult hints. The fact that the six year old normal children performed poorer than the rest of the normal subjects at HL III and HL IV is not surprising. The finding is similar to that of Ackerman (1978a) who found first graders less sensitive to context than third graders when interpreting unconventional indirect directives. Similar findings regarding inferencing ability and riddle comprehension of five and six year olds when compared with seven and eight year olds have also been reported (Paris, 1975; Omanson, et. al., 1978; Fowles and Glanz, 1977). In these studies, the five and six year olds

perform significantly poorer than the seven and eight year olds. It appears that the shift from the Piagetian pre-operational stage of thinking to the concrete operational stage of thinking (at around seven years of age) is necessary for the above mentioned tasks. When the child reaches the stage of concrete operations, his language is freed from his perceptions and he can deal with multiple meanings.

It is interesting to note, however, that the six year olds performed as well as the older children on the first two hint levels. Thus, they were capable of relating simple hints to the context and inferring the speaker's intent for these hints. It is only the harder hints which necessitate deeper inferencing and which require greater knowledge of the world which differentiated between the youngest subjects and the other children.

The lack of significant differences between the other normal children did not support hypothesis 2. This finding is similar to the findings of other studies which have reported eight year olds responding as older children respond or as adults respond in the comprehension of directives or the use of inference (Ackerman, 1978a, 1978b). The lack of significance between the eight, ten and twelve year olds occurred when the data were collapsed over hint levels. However, when the

responses at each hint level for each age were compared, a significant difference between the eight year old children and twelve year old children was found at HL IV. Thus the more difficult hints did discriminate between eight year olds and the older children and suggests that more obscure hints could be devised which would further discriminate between these groups.

No significant differences were found between the learning disabled subjects and between the older normal subjects when the data were collapsed over hint levels. Yet, when the data of normal and learning disabled subjects were added together, a significant difference was found between the eight year olds and the older children. It appears that the normal eight year olds were responding on a lower level than the older subjects and this level was further lowered by the addition of the learning disabled data. In contrast to this, the high level of correct responding for the normal ten and twelve year old subjects could withstand the addition of the learning disabled data.

The normal and the learning disabled populations

The learning disabled children's performance on hint comprehension, when compared with the normal children, was reminiscent of younger normal children's performance. Thus, hypothesis 5 was confirmed by this study.

As noted above, the performance of normal six year old children was significantly poorer than the remainder of the normal subjects at HL III and HL IV. Similarly, the performance of the learning disabled children was significantly poorer than the normal subjects at the more difficult hint levels. However, this was not true for all ages. The eight year old normal and learning disabled children performed equally well on the easy hints and equally poorly on the more difficult hints. The ten year old normal children displayed an increase of correct responses for hints at HL III and this increase resulted in a significant difference when compared with the learning disabled children of the same age. The learning disabled children also displayed an increase of correct responding at HL III, but only at age twelve. This latter increase removed the significant difference between the normal and learning disabled twelve year olds at HL III. However, a significant difference was found at HL IV which reflected an increase of correct responses for the normal subjects. The twelve year old learning disabled children remained at about the same level of responding for HL IV hints as the ten year old learning disabled children. It is possible that with a further increase in age, the learning disabled children would respond to all the hint levels as the older normal children did. This suggests that

the learning disabled children are indeed functioning like younger normal children. There is another possibility which also must be considered. In many schools, the younger mildly learning disabled children are mainstreamed. It is possible that the learning disabled subjects seen at ages eight and ten differ from the subjects seen at age twelve. The twelve year olds may have more severe learning disabilities as reflected in the fact that they have not been mainstreamed. Thus, inferring longitudinal conclusions from the data of the normal subjects may be warranted. However, such conclusions for the learning disabled population must be made with some caution. Nevertheless, as for the younger normal children, one may conclude that the learning disabled children were able to infer simple inferences and arrive at appropriate conclusions for simple hints. They encountered difficulty when the hints required deeper inferences, when goals were not mentioned and when greater knowledge of the world was necessary.

No differences were found between the eight, ten, and twelve year olds within the normal subjects and between the eight, ten, and twelve year olds within the learning disabled subjects when the data were collapsed over hint levels. However, different response patterns emerged within each of the ages in the normal subjects and within the learning disabled subjects. In the normal

subjects there was an attenuation of hint level differences so that for the ten year olds only the extreme hint levels (HL I and HL IV) were significantly different and for the twelve year olds there were no differences between hint levels. This was not true for the learning disabled children. The ten year old learning disabled children's response pattern was similar to that of the normal eight year old children's response pattern while the twelve year old learning disabled children responded more like younger learning disabled children. There was no decrease in hint level differentiation for the learning disabled population.

There were other differences between the two subject types. There was an increase in "hint awareness" as age increased in the normal subjects, confirming hypothesis 4. No such increase was evident for the learning disabled subjects. Only a few of the oldest learning disabled children indicated that hints were being used. This once again suggests that the learning disabled children were functioning like younger normal children and perhaps lacked the metalinguistic skill to reflect on the nature of the speech act being performed.

Another interesting difference between the two subject types involved "verbalizations." Garvey (1975) investigated young children's (3:6-5:7) requests and responses in spontaneous speech. She reported that requests were often responded to with gestures and with

additional verbal responses. It became apparent during this study that some of the eight and ten year old normal children were adding "verbalizations" to their answers. In some responses, the verbalization was brief and accompanied subsequent action. For example:

hint: Your hat should be taken off.

child: The lady said "sure" and took off her hat.

This kind of verbalization on the part of the story character appears to be a social response, perhaps an indication of politeness by responding first to the directive's literal meaning (Clark and Schunk, 1980). In some cases, the verbalization was the entire response. For example:

A. hint: I guesswe need a newspaper.

child: Father said, "Forget about the pizza" (non-compliance).

B. hint: That umbrella should be taken.

child: The boy said, "I'm taking the umbrella."

Finally there were children who added a whole conversation.

hint: I need some money.

child: Then she says, "May I borrow five or ten dollars?" and he tells her "Yes, sure" and he gives her the

five dollars and says, "Make sure you pay me back." Then the mother says "Thank you - ya want me to buy anything special for you?"

The addition of these verbalizations can be seen as an aspect of storytelling skills. The six year old children did not yet have or use these skills and the twelve year old children responded to the target hint without elaboration. Only several of the eight and ten year old learning disabled children included verbalizations in their responses. An increase of this response type was seen in the twelve year old learning disabled children, who once again appeared to be functioning like younger normal children.

Finally, the learning disabled subjects changed their responses more often than normal children when presented with probe questions. This may have been the result of the learning disabled children's uncertainty regarding their initial response.

Errors

Errors were classified according to their "directiveness." The ND (non-directive) errors reflected no awareness of the hint as a directive. The S/a (speaker as actor) and X_A (wrong actor) errors reflected an awareness that an action should be performed but by the wrong actor and often by the speaker himself.

The X_D (an additional directive is used) errors suggested comprehension of the hint as a preliminary to a more explicit directive. Finally X_{LA} (literal action) errors suggested awareness of the hint as a directive since the listener in the story carried out an action, but it was the wrong action. Thus the intended directive was not understood. All the errors suggested a literal understanding of the utterance. In easier hints, a literal understanding meant that the syntactic reading of the hint resulted in a statement rather than a directive interpretation. This was seen in the S/a and X_D errors at the easier hint levels. A literal understanding of more difficult hints also resulted in statement interpretation as in the ND errors, as well as in directive interpretations, although the action in this latter interpretation was that of the syntactic reading.

For example:

hint: I need sunglasses in here.

child: They brought him sunglasses.

Often when the action was that of the syntactic reading, there was a conflict between the children's response and knowledge of the world (people don't usually wear sunglasses indoors). In spite of this, children continued to respond using this literal interpretation. Thus the initial part of hypothesis 3 was confirmed but had to be expanded since literal interpretations were made

to easy as well as difficult hints.

It is interesting that for the normal children, there were no X_{LA} errors for the easiest hints. If the children comprehended the easy hints as directives, and understood that the listener was to act, they also knew that action was occurring. (The learning disabled children did not behave in this way.) At the same time, HL IV had the lowest percentage of S/a errors of all the hint levels for both subject types. It appears that children did not regard the difficult hints as the kinds utterances speakers produce prior to performing the act themselves.

There are two interesting observations regarding the error distribution according to age. First, younger children made more ND errors than older children. Thus, younger children were less aware of the directive nature of the hints or of the necessity for action in these contexts. Second, a large percentage of the errors of the ten year old children were X_D errors. This error was absent from the six year old normal subjects and more prevalent in the twelve year old learning disabled subjects than other learning disabled subjects. Since some of the X_D errors (those in verbalizations) were also counted as "verbalization" (see above) this distribution, which is similar to the verbalization distribution, is not surprising. In the X_D error the child

specifies the directive explicitly. The X_D error may also be associated in storytelling skills.

When comparing the normal and learning disabled children's error distributions, it is obvious that the eight year old learning disabled children had difficulty understanding that an action was desired by the speaker. Their high percentage of ND errors and low percentage of X_D errors is similar to the errors of the normal six year old children. However the learning disabled children had many more ND errors than younger normal children. The ten year old learning disabled children produced very few X_D errors when compared with normals of the same age and also produce a high percentage of O responses. These latter responses were often responses which were unclear or ambiguous. The high percentage of this error might be the result of poor comprehension or alternatively, the result of the ten year old learning disabled children's hesitancy to say too much or to make a firm response. Finally, the similar error distribution of the normal and learning disabled twelve year olds does not necessarily mean that they are at the same level of functioning. For example, if the X_D error is related to storytelling, the normal twelve year old child no longer presents this response although they may be competent storytellers. The oldest learning disabled children may only be starting to

develop this skill.

Groups and hint presentation

An important question in this study concerned the comparability of hint difficulty within a hint level. Although the procedure for devising the hints was elaborate, differences between hints within hint levels still existed. These differences account for the hint x presentation interaction. Some of the groups had easier hints than other groups at a particular hint level. The greatest uniformity among the hints was at HL I. As well as being explicit, these hints were also similar in structure. The greatest diversity among hints was at HL IV. Yet even at HL II, III and IV, there were only about five hints which were obviously easier or more difficult than the rest. Two stories and their hints repeatedly appeared to be difficult (stories #7 and #10). Interestingly, these two stories had similar structures which were not found in the other stories. In these stories, a statement was made and a list of objects or events was mentioned. The hint related to one of these objects or events. It is possible that by presenting the important information within a list, the information appeared incidental rather than part of the main theme. There is some evidence that listeners are better at verifying statements relating to the main part of a narrative and readers are better at verifying

statements relating to incidental details (Hildyard and Olson, 1978). Thus, it may be that the stories themselves contributed to the difficulty of these hints rather than the hints themselves. There might also be a relationship between a context which is well known to a child and the ease or difficulty of a hint. If the context is a familiar one, even a more difficult hint will result in an appropriate response. For example, children are expected to go to sleep at eight o'click at night (story #18). On the other hand, a child might expect certain behaviors in familiar settings which could result in a wrong response to the hint. For example, mothers are supposed to make coffee for fathers (story #15). In addition, more difficult hints may be understood because of the particular experience of children. The sociolinguistic aspect of hint comprehension and hint difficulty is, therefore, difficult to control.

Relevant information needed for hint comprehension was given in the story, in the accompanying photographs, or in both. An attempt was made to present only the general setting and information necessary for hint comprehension and not to mention explicitly information which in a naturalistic setting would not be stated. While no formal analysis was done, it appeared that when there was redundant information (information given

in the story and pictures), the hints were easier than if the relevant information was presented only visually or auditorally. But even this rule is not an absolute rule, for story #7 had information presented both visually and auditorally and yet, it had a large percentage of errors at all hint levels.

Implications for the learning disabled children

One of the major findings of this study is that the learning disabled children performed significantly poorer than normal children of the same age in a task of hint comprehension. This finding supports other similar findings (see Chapter 1) that the learning disabled child has difficulties with the comprehension of language. The learning disabled child functions in hint comprehension as a younger normal child. The skills necessary for the comprehension of hints include linguistic, cognitive and social abilities. It is premature at this point to attempt to determine what aspect of hint comprehension results in this poor performance. It is possible that the learning disabled child, as the younger child, has difficulty drawing complex inferences. The learning disabled child may have difficulty using contextual information and his own experiences when attempting to comprehend hints. The learning disabled child may not have learned conversational rules and be unaware of maxim violations.

Some of the skills necessary for hint comprehension are also necessary for reading comprehension. Hildyard and Olson (1978) state that high readers were better able to draw inferences than poor readers. Studies of story comprehension have concluded that evaluations of children's inferencing result in a better measure of story comprehension than memory tasks (Omanson et. al., 1978). Thus the learning disabled child who has difficulty with the harder hints will also have difficulty understanding texts which require drawing deep inferences.

It also becomes crucial to ascertain what the verbal environment of the learning disabled population is like. Do teachers, for example, direct these children with hints that they cannot comprehend? In what way will poor hint comprehension effect the learning disabled child's peer socialization? Bryan (1977) has reported that these children's difficulties in social interactions may result from their inappropriate response to non-verbal communications. A similar conclusion can be drawn from this study. Poor hint comprehension may result in poor social interactions. On the other hand, an inability to respond to non-verbal communications and an inability to mobilize social experience may result in a poor understanding of the verbal and non-verbal context in which the hint is issued and subsequently result in poor comprehension of the hint itself.

Future Research

This study has presented hints of various levels of difficulty and has attempted to formulate a model of hint difficulty. However, a better understanding of the comprehension of hints is still necessary. Further attempts should be made to analyze easy and difficult hints and to determine whether harder hints can be devised which are more uniform in their difficulty. The question remains as to whether hints can be devised which are more difficult than the level IV hints of this study and which would further differentiate between normal and learning disabled children at older ages.

This study investigated hints as directives. However, hints can be used to communicate a variety of messages, e.g., compliments, warnings, insults, etc. It would be interesting to see whether the findings in this study can be replicated with hints of different intended meanings. In addition, the hints in this study were all statements. Statements were used in order to obtain a clearer picture of the verbal additions in the children's responses. It is assumed that if questions were used, verbalizations would increase in the children's responses. Polite responses to polite requests (the latter being indirect directives with interrogative structures) include verbal additions (Clark and Schunk, 1980). To what extent are children aware of the use

of these verbal additions as an indication of politeness? Finally, other speech acts (such as compliments) should be studied to determine which of these are also understood as directives, as alluded to in this study.

Hint comprehension depends on the use of context and non-verbal information, conversational skill, inferencing, etc. In a naturalistic setting, children might have greater access to non-verbal information (gestures, non-verbal context) which would aid in hint comprehension. Pictures do not always adequately present the context and surely do not compare with the actual situation. And yet, it is possible that information regarding the setting was explicitly stated in these stories, information which would not necessarily be explicit or obvious in a naturalistic setting. Thus, it is possible that hint comprehension in a natural setting would be poorer than hint comprehension in this study. The difference between what is explicit in natural situations and in experimental studies is of importance. Furthermore, a naturalistic study of hint comprehension is important to see whether the results of this study will be replicated. Questions of interest could include hint comprehension, errors made in naturalistic settings, additions of verbal elements, etc.

In order to determine what aspects of this study contributed to hint comprehension, various modifications

of the study are suggested. Stories might be presented without the hints to determine how much information the stories and pictures present which results in the target action. Stories might be presented without pictures and pictures without stories to determine the contribution of visual vs. auditory information in hint comprehension.

Finally, to what extent can children under six comprehend hints? Alternatively, how do learning disabled children who are even older than the children in this study respond to hints? Does the learning disabled population "catch up" with the normal population in this area of conversational speech? Future research will attempt to answer some of these questions.

APPENDIX A

(After each indirect directive/hint, the examiner asked, "What happened next?")

Difficulty Rating of Hints: (in parenthesis after hint)

Level 1: difficulty rating: 1-1.5
Level 2: difficulty rating: 1.5-2.2
Level 3: difficulty rating: 2.3-3.06
Level 4: difficulty rating: 2.9-4.0

Training Stimuli:

1. The children are playing in their rooms. Mom comes in and says, "Pick up your toys."
2. Danny has a cookie. When Sara sees it, she says, "Go get me one."
3. Amy has just come home from the store. Bobby says, "Show me what you bought."

Experimental Stimuli:

1. Joey is playing and putting things in the fireplace. When he goes into the next room, his brother says, (hint: wash your face)
    1. Your face needs washing. (1)
    2. What a dirty face. (1.66)
    3. I have some soap. (2.86)
    4. Next time, leave some dirt for me. (3.3)

2. Mary parked her car. Dick came out and said . . . (hint: move your car)
    1. Someone should move that car. (1.33)
    2. What a place to park that car. (1.8)
    3. I see you're planning to leave. (2.6)
    4. Someone should move this driveway. (2.93)

3. Danny is holding a bag of candy. He eats a few pieces. His mother comes in and says . . . (hint: stop eating the candy)
    1. The candy is not to be eaten. (1.13)
    2. You're spoiling your appetite with that candy. (2)
    3. I can already imagine the cavities. (2.6)
    4. Two or three cavities aren't so bad. (3.4)

4. The teacher tells the pupils to hand in their typed reports. Scott gives his paper to the teacher. She gives it back to him and says . . . (hint: type this paper)
    1. You know, this paper should be typed. (1)
    2. You can type on my typewriter. (1.73)
    3. Typing is a good skill. (2.6)
    4. You wrote this with your toes. (3)

5. John visits Mary on a cold, winter day. He comes in, sits down and starts to talk. Mary says . . . (hint: take off your coat)
    1. Your coat should be taken off. (1.2)
    2. I guess you think you need your coat. (2.2)
    3. It's really very warm in here. (2.5)
    4. I only have ten hangers which are lonely. (3.2)

6. Mother washed her hands. Her hands are all wet and she says to Billy . . . (hint: give me the towel)
    1. I need a towel. (1)
    2. I see you have the towel. (1.53)
    3. Water is dripping from my hands. (2.5)
    4. The store could send a hairdryer. (3.8)

7. Mother and Dad are eating supper at home. The table is set with soup, spoons, napkins and salt. Mother and dad begin to eat the soup and mother says . . . (hint: pass the salt)
    1. The soup needs salt. (1.26)
    2. I thought there was salt on the table. (2.2)
    3. I wish someone would pass some spices. (2.5)
    4. This restaurant serves tasteless soup. (3.6)

8. Adam is jumping on the bed. Mother comes in and says . . . (hint: stop jumping on the bed)
    1. This bed isn't for jumping. (1.06)
    2. The bed is going to break. (1.53)
    3. Kangaroos live in the zoo. (3.06)
    4. I see you're practicing for your circus job. (3.6)

9. Mother is going shopping. She looks in her wallet and says to father . . . (hint: give me some money)
    1. I need some money. (1)
    2. There's no money in my wallet. (1.66)
    3. There's nothing in the house to eat. (2.93)
    4. We're gonna have beans for supper. (3.73)

10. Dad comes home at night. The dog is barking, all the lights are on and the children are all up watching TV. He says to the children . . . (hint: turn off some lights)
    1. Some of the lights should be turned off. (1)
    2. All the lights are on. (1.5)
    3. It's very bright in here. (2.8)
    4. I need sunglasses in here. (3)

11. Mother comes in from the car with the groceries. She sees Joey sitting on the steps and says . . . (hint: carry in some packages)
    1. The packages have to be carried in.
    2. There are more packages in the car.
    3. I see you're resting.
    4. Oh, you broke your hands.

12. Amy went to the bathroom to take a shower. Her mother comes to the door and after fifteen minutes says . . . (hint: open the door)

1. This door should be opened.
2. I see you've locked the door.
3. My feet hurt.
4. I guess you shrunk.

13. These people are going to watch a movie. A lady comes in, takes off her coat, and sits in from of Amy. After a minute, Amy says to her . . . (hint: take off your hat)
    1. You know, your hat should be taken off.
    2. You only took off your coat.
    3. I guess you're gonna leave soon.
    4. I guess you think your clothes are made of glass.

14. Father and Danny are going to buy a newspaper. They pass a pizza store and Danny says . . . (hint: buy me a pizza)
    1. I want some pizza.
    2. There's a fresh pizza.
    3. I guess we need a newspaper.
    4. Oh, Dad, I'm fainting.

15. Mother is eating breakfast. Father comes in and wants coffee. Mother says . . . (hint: make your own coffee)
    1. I guess your coffee has to be made.
    2. The coffee jar is in the kitchen.
    3. You'll get tired standing there.
    4. The maid grew wings and flew away.

16. Mary told her mother she was going on a hike with her boyfriend. She went upstairs to get dressed. When she came down, her mother said . . . (hint: change your clothes)
    1. Your clothes should be changed.
    2. What strange clothes for a hike.
    3. Oh, you didn't put on your sneakers.
    4. That mountain must have an elevator.

17. A man and a woman are driving down the highway to the movies. All of a sudden, the woman says . . . (hint: slow down)
    1. This car should slow down.
    2. This car is going too fast.
    3. You're gonna get a ticket soon.
    4. We'll get to the fire before the fire engines.

18. It's 8:00 at night and the children are in the playroom. Mother comes in, looks at her watch and says . . . (hint: go to sleep)
    1. You know, it's time to go to sleep.
    2. You boys aren't asleep.
    3. I'm closing the playroom lights.
    4. Even the toys are yawning.

19. Although the weather was bad, Danny is going out. Mary says . . . (hint: take an umbrella/raincoat/boots)
    1. That umbrella should be taken.
    2. The umbrella is near the door.
    3. You'll get very wet outside.
    4. Rain isn't so wet.

20. Dad and Joey are playing ball. They throw the ball back and forth, back and forth. Danny watches and finally says . . . (hint: throw the ball to me)
    1. Next time, I want the ball.
    2. I see you're throwing to each other.
    3. I don't like this game.
    4. My measles aren't catchy.

Non-directive stimuli

21. Mother gives Amy her scissors. Amy says, "Wow, thanks, these are your big scissors."

22. Dad is making a bookcase in his workshop. Danny comes in, "That will be a nice bookcase."

23. Andy has one piece of train track. He finds another one and says, "Now I have two pieces."

24. Jody and Donald are playing with the truck. They hide it in a box. Jody says, "Now our baby brother won't find it."

25. Donald picks up a box and says, "I'm going to make believe this is a telescope." David picks up a train and says, "I'm going to make believe I'm a conductor."

APPENDIX B

Analysis of Variance

ANALYSIS OF VARIANCE TABLE BY STORIES (F_2)

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-TEST	SIGNIFICANCE	PERCENT OF TOTAL SUM OF SQUARE
HNT	11.699	3	3.899	20.560***	UNDER 0.001	18.31
HNT X UNIT	10.811	57	0.190	NOT TESTED		16.92
TYPE	3.175	1	3.175	130.266***	UNDER 0.001	4.97
TYPE X UNIT	0.463	19	0.024	NOT TESTED		0.72
AGE	1.180	2	0.590	10.892***	UNDER 0.001	1.85
AGE X UNIT	2.059	38	0.054	NOT TESTED		3.22
HNT X TYPE	1.345	3	0.448	6.330***	0.001	2.11
HNT X TYPE X UNIT	4.037	57	0.071	NOT TESTED		6.32
HNT X AGE	0.698	6	0.116	2.068	0.063	1.09
HNT X AGE X UNIT	6.415	114	0.056	NOT TESTED		10.04
TYPE X AGE	0.151	2	0.076	1.389	0.262	0.24
TYPE X AGE X UNIT	2.069	38	0.054	NOT TESTED		3.24
HNT X TYPE X AGE	1.371	6	0.229	2.714*	0.017	2.15
HNT X TYPE X AGE X UNIT	9.599	114	0.084	NOT TESTED		15.02
UNIT	8.820	19	0.464	NOT TESTED		13.80
TOTAL	63.893	479	0.133			100.00

AN ASTERISK (*) MARKS THE EFFECT USED IN TESTING THE PRECEDING EFFECTS

ANALYSIS OF VARIANCE TABLE BY SUBJECTS (N_1 AND LD) (F_1)

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-TEST	SIGNIFICANCE	PERCENT OF TOTAL SUM OF SQUARE
TYPES	1.837	1	1.837	25.931***	UNDER 0.001	7.41
AGE	0.576	2	0.288	4.065*	0.024	2.32
PRES	0.362	3	0.121	1.701	0.180	1.46
TYPES X AGE	0.094	2	0.047	0.661	OVER 0.500	0.38
TYPES X PRES	0.365	3	0.122	1.717	0.177	1.47
AGE X PRES	0.246	6	0.041	0.580	OVER 0.500	0.99
TYPES X AGE X PRES	1.040	6	0.173	2.446*	0.039	4.19
UNIT	3.400	48	0.071	NOT TESTED		13.72
HNT	7.090	3	2.363	69.552***	UNDER 0.001	28.60
TYPES X HNT	0.745	3	0.248	7.307***	UNDER 0.001	3.00
AGE X HNT	0.397	6	0.066	1.950	0.077	1.60
PRES X HNT	1.686	9	0.187	5.512***	UNDER 0.001	6.80
TYPES X AGE X HNT	0.740	6	0.123	3.628**	0.003	2.98
TYPES X PRES X HNT	0.189	9	0.021	0.618	OVER 0.500	0.76
AGE X PRES X HNT	0.718	18	0.040	1.174	0.291	2.90
TYPES X AGE X PRES X HNT	0.411	18	0.023	0.673	OVER 0.500	1.66
HNT X UNIT	4.893	144	0.034	NOT TESTED		19.74
TOTAL	24.789	287	0.086			100.00

AN ASTERISK (*) MARKS THE EFFECT USED IN TESTING THE PRECEDING EFFECTS

ANALYSIS OF VARIANCE TABLE FOR NORMAL POPULATION (N_2)

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-TEST	SIGNIFICANCE	PERCENT OF TOTAL SUM OF SQUARE
AGE	2.937	3	0.979	12.499***	UNDER 0.001*	16.16
PRES	0.141	3	0.047	0.598	OVER 0.500	0.77
AGE X PRES	0.700	9	0.078	0.993	0.465	3.85
UNIT	2.507	32	0.078	NOT TESTED		13.79
HNT	4.861	3	1.620	52.547***	UNDER 0.001*	26.74
AGE X HNT	2.027	9	0.225	7.304***	UNDER 0.001*	11.15
PRES X HNT	1.250	9	0.139	4.505***	UNDER 0.001*	6.88
AGE X PRES X HNT	0.792	27	0.029	0.952	OVER 0.500	4.36
HNT X UNIT	2.960	96	0.031	NOT TESTED		16.29
TOTAL	18.175	191	0.095			100.00

AN ASTERISK (*) MARKS THE EFFECT USED IN TESTING THE PRECEDING EFFECTS

APPENDIX C

Comparison of correct responses (means) at different hint levels for each story.

	1		2
1	.95		.90
2	.85		.66
3	.71	<	.80
4	.85	<	.95
5	.95		.42
6	.95		.61
7	.33		.28
8	.95		.71
9	.85		.61
10	.56		.42
11	1.00		.90
12	.90		.75
13	1.00		.61
14	1.00		.85
15	.23	<	.80
16	1.00		.80
17	.95		.85
18	1.00		.80
19	.90		.90
20	.85		.75

Comparison of correct responses (means) at HL I and HL II for each story. Stories in which HL II means are greater than HL I means are noted (<).

	1		3
1	.95		.52
2	.85		.42
3	.71		.33
4	.85		.47
5	.95		.33
6	.95		.56
7	.33		.18
8	.95		.85
9	.85		.47
10	.56		.28
11	1.00		.37
12	.90		.76
13	1.00		.38
14	1.00		.37
15	.23	<	.28
16	1.00		.09
17	.95		.28
18	1.00		.51
19	.90		.85
20	.85		.42

Comparison of . correct responses (means) at HL I and HL III for each story. Stories in which HL III means are greater than HL II means are noted (<).

	1		4
1	.95		.14
2	.85		.66
3	.71		.47
4	.85		.33
5	.95		.42
6	.95		.04
7	.33		.14
8	.95		.56
9	.85		.47
10	.56		.23
11	1.00		.33
12	.90		.52
13	1.00		.66
14	1.00		.52
15	.23	<	.52
16	1.00		.61
17	.95		.18
18	1.00		.76
19	.90		.47
20	.85		.66

Comparison of correct responses (means) at HL I and HL IV for each story. Stories in which HL IV means are greater than HL I means are noted (<).

	2		3
1	.90		.52
2	.66		.42
3	.80		.33
4	.95		.47
5	.42		.33
6	.61		.56
7	.28		.18
8	.71	<	.85
9	.61		.47
10	.42		.28
11	.90		.37
12	.75	<	.76
13	.61		.38
14	.85		.38
15	.80		.28
16	.80		.09
17	.85		.28
18	.80		.51
19	.90		.85
20	.75		.42

Comparison of correct responses (means) at HL II and HL III for each story. Stories in which HL III means are greater than HL II means are noted (<).

	2		4
1	.90		.14
2	.66		.66
3	.80		.47
4	.95		.33
5	.42		.42
6	.61		.04
7	.28		.14
8	.71		.56
9	.61		.47
10	.42		.23
11	.90		.33
12	.75		.52
13	.61	<	.66
14	.85		.52
15	.80		.52
16	.80		.61
17	.85		.18
18	.80		.76
19	.90		.47
20	.75		.66

Comparison of correct responses (means) at HL II and HL IV for each story. Stories in which HL IV means are greater than HL II means are noted (<).

	3		4
1	.52		.14
2	.42	<	.66
3	.33	<	.47
4	.47		.33
5	.33	<	.42
6	.56		.04
7	.18		.14
8	.85		.56
9	.47		.47
10	.28		.23
11	.37		.33
12	.76		.52
13	.38	<	.66
14	.37	<	.52
15	.28	<	.52
16	.09	<	.61
17	.28		.18
18	.51	<	.76
19	.85		.47
20	.42	<	.66

Comparison of correct responses (means) at HL III and HL IV for each story. Stories in which HL IV means are greater than HL III are noted (<).

APPENDIX D

Correct responses (means) for N_1 and LD subjects at three ages for each hint level.

AGE

SUBJECT TYPE	8	10	12
N_1	.800	.933	.833
LD	.783	.850	.833

Hint Level I (HL I)

SUBJECT TYPE	8	10	12
N_1	.817	.750	.833
LD	.617	.800	.667

Hint Level II (HL II)

SUBJECT TYPE	8	10	12
N_1	.450	.667	.650
LD	.450	.283	.450

Hint Level III (HL III)

SUBJECT TYPE	8	10	12
N	.467	.633	.800
LD	.233	.383	.367

Hint Level IV (HL IV)

APPENDIX E

Type x Age x Group Interaction (N_1 + LD)

AGE

SUBJECT TYPE	8	10	12
N_1	.650	.617	.867
LD	.650	.733	.633

correct responses (means) for Group A

SUBJECT TYPE	8	10	12
N_1	.667	.750	.733
LD	.367	.633	.500

correct responses (means) for Group B

SUBJECT TYPE	8	10	12
N_1	.500	.817	.767
LD	.550	.417	.583

correct responses (means) for Group C

SUBJECT TYPE	8	10	12
N_1	.717	.800	.750
LD	.517	.533	.600

correct responses (means) for Group D

APPENDIX F

Hint x Group Interaction

(N_1 and LD)

HINT LEVEL

	HL I	HL II	HL III	HL IV
Group				
A	.933	.733	.478	.622
B	.911	.667	.467	.389
C	.633	.844	.456	.489
D	.878	.744	.567	.422

APPENDIX G

Hint x Group Interaction (N_2)

	HINT LEVEL			
	I	II	III	IV
GROUP				
A	.933	.633	.400	.583
B	.950	.750	.500	.450
C	.650	.833	.467	.550
D	.900	.833	.583	.467

APPENDIX H

Chi Square Analysis of Errors

	ND	S/a	X_A	X_D	X_{LA}	0 + NR	TOTAL
L I	3 (6.5)	24 (8.3)	2 (3.7)	5 (4.4)	- (7.47)	- (3.48)	34
L II	8 (11.18)	13 (14.32)	3 (6.46)	18 (7.5)	10 (12.75)	6 (5.9)	58
L III	23 (23.7)	26 (30.37)	13 (13.7)	15 (15.9)	29 (27)	17 (12.59)	123
L IV	30 (20.8)	19 (26.67)	19 (12.03)	5 (13.9)	34 (23.74)	11 (11.06)	108
TOTAL	64	82	37	43	73	34	332

$$x^2(15) = 84.44$$
$$p < .001$$

Chi square analysis of errors for normal subjects (N_2) at four hint levels.

	ND	S/a	X_A	X_D	X_{LA}	0 + NR	TOTAL
6	39 (24.86)	34 (31.86)	9 (13.98)	0 (16.70)	34 (28.36)	13 (13.2)	129
8	15 (16.96)	25 (21.73)	10 (9.54)	14 (11.39)	18 (19.34)	6 (9.01)	88
10	6 (11.75)	8 (15.06)	9 (6.61)	22 (7.90)	8 (13.4)	8 (6.24)	61
12	4 (10.4)	15 (13.33)	8 (5.85)	7 (6.99)	13 (11.87)	7 (5.53)	54
TOTAL	64	82	36	43	73	34	332

$$x^2(15) = 71.4819$$
$$p < .001$$

Chi square analysis of errors for the normal subjects (N_2) at four ages.

	ND	S/a	X_A	X_D	X_{LA}	0 + NR	TOTAL
L I	5 (7.97)	17 (7.17)	1 (4.21)	1 (3.07)	4 (7.17)	8 (6.37)	36
L II	19 (11.74)	10 (10.56)	5 (6.20)	10 (4.52)	4 (10.56)	5 (9.39)	53
L III	24 (23.9)	18 (21.53)	16 (12.64)	7 (9.22)	22 (21.53)	21 (19.1)	108
L IV	22 (27.24)	18 (24.52)	15 (14.40)	9 (10.50)	33 (24.52)	22 (21.79)	123
TOTAL	70	63	37	27	63	56	316

$$X^2(15) = 45.8892$$

$$P < .001$$

Chi square analysis of errors for the learning disabled subjects at four hint levels.

	ND	S/a	X_A	X_D	X_{LA}	0 + NR	TOTAL
8	48 (25.47)	20 (22.92)	14 (13.46)	4 (9.82)	20 (22.92)	9 (20.37)	115
10	12 (22.15)	22 (19.93)	10 (11.70)	5 (8.54)	27 (19.93)	24 (17.72)	100
12	10 (22.37)	21 (20.13)	13 (11.82)	18 (8.62)	16 (20.13)	23 (17.89)	101
TOTAL	70	63	37	27	63	56	316

$$x^2(10) = 61.2023$$
$$P < .001$$

Chi square analysis of errors for the learning disabled subjects at three ages.

	ND	S/a	X_A	X_D	X_{LA}	0 + NR	TOTAL
N	15 (27.3)	25 (19.50)	10 (10.40)	14 (8.23)	18 (16.47)	6 (6.50)	88
LD	48 (35.68)	20 (25.49)	14 (13.59)	4 (10.19)	20 (21.52)	9 (8.49)	115
TOTAL	63	45	24	18	38	15	203

$$x^2(5) = 20.6806$$
$$P < .001$$

Chi square analysis of errors for the eight year old normal and learning disabled children.

	ND	S/a	X_A	X_D	X_{LA}	0 + NR	TOTAL
N	6 (6.8)	8 (11.36)	9 (7.19)	22 (10.22)	8 (13.76)	8 (12.12)	61
LD	12 (11.18)	22 (18.63)	10 (11.80)	5 (16.77)	27 (21.73)	24 (19.87)	100
TOTAL	18	30	19	27	35	32	161

$$x^2(5) = 27.8198$$

$$P < .001$$

Chi square analysis of errors for the ten year old normal and learning disabled children.

	ND	S/a	X_A	X_D	X_{LA}	0 + NR	TOTAL
N	4 (4.87)	15 (12.54)	8 (7.3)	7 (8.70)	13 (10.10)	7 (10.45)	54
LD	10 (9.12)	21 (23.45)	13 (13.68)	18 (16.29)	16 (18.89)	23 (19.54)	101
TOTAL	14	36	21	25	29	30	155

$x^2(5) = 4.6174$

not significant

Chi square analysis of errors for the twelve year old normal and learning disabled children.

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