IDENTIFICATION OF STUTTERING BY YOUNG CHILDREN

by

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CHAPTER I
INTRODUCTION

There has been controversy in the past decades over a definition of stuttering. Because of this, there have been differences of opinion among scholars regarding the topic of identification and whether specific errors in fluency are stuttering or normal in speech (Wingate, 1964; Bloodstein, 1970; Bjerkan, 1980; Curlee, 1981; and Hamre, 1992). Some investigators believe that stuttering is easily identified by certain characteristics (Bjerkan, 1980; Hamre, 1992; and Wingate, 1964) and others believe that it is difficult to identify stuttering because stuttering is only a high frequency of normal disfluencies (Bloodstein, 1970 and Curlee, 1981).

The purpose of this investigation is to determine whether young children notice a difference between fluent utterances and those containing instances of stuttering. If the children respond differently to the fluent and stuttered utterances during an identification task, this may indicate that they find the two types of speech categorically different. If they respond similarly to the two types of utterances and do not treat the two differently, then this may suggest that young children are not able to identify stuttering and do not regard the instances as being different from normal speech.
CHAPTER II
LITERATURE REVIEW

Identification of Stuttering

There is abundant literature on the definition of stuttering. Several authors in the field of stuttering adhere to definitions that focus on certain aspects of the disorder that distinguish it from normal speech and normal disfluency. Definitions have focused on several components ranging from the behavior that is observed by the listener (Wingate, 1964) to the "involuntary loss of control" (Perkins, 1990) experienced by the stutterer.

Wingate (1964) provided a "standard definition of stuttering." He stated that the definition should "(a) identify and emphasize discriminative features, (b) be amenable to general application and (c) agree with our current state of knowledge of stuttering" (p. 484). He also said that a definition should include characteristics that are always present and also those that may be present in some stutterers and not in others (Wingate, 1964).

The most important features which were proposed in this definition were the "speech characteristics." Wingate described these as being "silent or audible unitary repetitions or prolongations." The two other components were "accessory features" and "associated features" which may or may not be present (Wingate, 1964).
Another definition has been proposed by Bloodstein (1970). His "Continuity Hypothesis" was developed from the beliefs of Johnson’s view of stuttering. Both have based their explanation of stuttering on the belief that stuttering cannot be objectively defined and that it is a label sometimes applied to a high frequency of normal disfluencies in the speech of an individual (Bloodstein, 1970).

One definition, proposed by Perkins (1983, 1990), focused on the "involuntary loss of control that is experienced by the stutterer during the stuttered event" (p. 247, 376). Perkins (1990) felt that this feature was the only component that could distinguish stuttering from disfluencies that are not truly stuttering.

Investigations have been conducted to test the validity of several of the definitions proposed for stuttering and to determine a new and universal definition of stuttering using the findings. These investigations have studied whether stuttering is easily identified by adults (Tuthill, 1940; Boehmler, 1958; MacDonald and Martin, 1973; Young, 1975; Curlee, 1981; Martin and Haroldson, 1981; Kully and Boberg, 1988; Zebrowski and Conture, 1989; and Moore and Perkins, 1990).

The results of some of the studies revealed that stuttering is difficult to identify, to differentiate from normal disfluencies, or that the two categories of
disfluency are ambiguous (Tuthill, 1940 and 1946; Boehmler, 1958; Young, 1975; Curlee, 1981; Martin and Haroldson, 1981; and Kully and Boberg, 1988). Other studies have found that identifying stuttering or differentiating stuttering and normal disfluency is not difficult and that the two classes of disfluencies are unambiguous (MacDonald and Martin, 1973; Bjerkan, 1980; and Zebrowski and Conture, 1989).

Tuthill (1940, 1946) measured the reliability of identification of stuttering and applied the results to the "extentional meaning" of stuttering. Twenty stutterers, 20 graduate students or staff whom had been clinicians, and 38 normal speakers with no training in speech pathology followed a transcript while listening to a record of speech. They were required to mark on the transcript when stuttering occurred. Low reliability among trained and untrained judges was reported. It was concluded that "the results in this study tended to indicate, in a number of different ways, that 'stuttering' is not a single-valued word with the extension sharply differentiated from that of 'non-stuttering'" (Tuthill, 1940, p.95).

Boehmler (1958) investigated responses to disfluencies by having ten graduate students in speech pathology, ten staff members at "the Institute of Logopedics" with as much training as the speech pathology graduate students and ten college students who were untrained in speech pathology listen to tape recorded speech samples of 30 stutterers and
nonstutterers and mark instances of non-fluency with an "S" or "N" for stuttering or "nonstuttering" (Boehmler, 1958). It was found that there were significant differences between trained subjects and untrained subjects. The group of trained subjects had the highest frequency of usage of the "stuttering" label. This is consistent with Tuthill (1946) who also found clinicians to mark more instances of "stuttering."

Boehmler (1958, p. 135) also reported that "the more severe the non-fluency, the more likely it was to be labeled stuttering." It was noted that the types of disfluencies likely to be labeled stuttering were sound and syllable repetitions and that those likely not to be labeled stuttering were revisions and interjections (Boehmler, 1958).

Finally, it was found that interjudge reliability was highest with regard to the nonfluencies of the stutterers which were severe and with those of the nonstutterers which were mild. Interjudge reliability was lowest with regard to the nonstutterers most severe disfluencies and the stutterers mild disfluencies (Boehmler, 1958).

Young (1975) conducted an investigation to determine the interobserver agreement when marking instances of stuttering. He conducted several replications of the study in which four graduate students in speech pathology heard audiotapes of stutterers and were required to mark instances
of stuttering on a transcript. Slight variations were made in attempt to improve interjudge reliability. First, the instructions given to the subjects did not include a description of the behaviors and there was no training session. Second, behaviors that identified stuttering were discussed among the subjects in order to ensure that similar criteria were being used. Third, instructions were given to "mark all interruptions in fluency." Subjects were restricted to one presentation of the speech sample for each of the three judgments. It was found that agreement between subjects was low for all three types of instructions (Young, 1975).

Young (1975) concluded that poor agreement may have been due to several factors. These may have been momentary lapses in attention, the speed with which the stuttering behavior was performed, the behavior itself that may have been of such small consequence, the assumption that a word is a valid unit of analysis and the fact that perceptual boundaries between fluent and stuttered speech behaviors are not fixed for any single observer or for many observers. (Young, 1975, pp. 535-536)

MacDonald and Martin (1973) measured the ambiguity of the two labels for disfluencies (stuttering and disfluency) by analyzing the inter- and intrajudge reliability of the labels given to errors in fluency by 31 graduate students untrained in speech pathology in one session and 26 of the same 31 graduate students in a second, identical session. It was concluded from the results that the categories of stuttering and disfluency were "two separate response
classes sufficient to the requirements of behavioral research and the terms stuttering and disfluency were generally applied to different and nonoverlapping behaviors" (MacDonald and Martin, 1973, p. 691).

Curlee (1981) replicated the study by MacDonald and Martin (1973) to determine whether similar results would be revealed if procedures were modified. He suggested that MacDonald and Martin (1973) may have obtained the results that revealed high reliability of marking stuttering because they allowed stutterers to correct their judgments of stuttering using the same transcript for each condition. Curlee (1981) supplied a separate transcript for each condition to achieve independent judgments.

In the first experiment, twenty-three graduate students in speech and hearing sciences were required to view videotape recordings and make judgments on three separate occasions of passages read by eight stutterers. They were instructed to mark "stuttering only or disfluencies only" during the first session and "stuttering only or disfluencies only" during the second session. During the third session, the subjects were given Wingate’s (1964) definition of stuttering as a guideline for half of their judgments. The first and second sessions were separated by a break and the second and third sessions were one week apart (Curlee, 1981).
In the second experiment, eight undergraduate students with introductory training in stuttering and eight graduate students in speech and hearing sciences were instructed to view videotape recordings and make judgments on speech samples of the same eight stutterers "during a self-formulated speech task." These subjects were given Wingate's (1964) definition to use throughout the study (Curlee, 1981).

The results from this investigation revealed that significantly more "ambiguous judgments" were recorded. Described by Curlee (1981), these were "units which were judged to be both stuttering and disfluency" (p. 597). It was concluded that "stuttering and disfluency are not two reliable and unambiguous response classes and are not usually applied to different, nonoverlapping behaviors." It was also stated that these findings "supported Bloodstein's (1970) continuity hypothesis" (Curlee, 1981, p. 599).

Martin and Haroldson (1981) conducted a study to determine reliability of identification of stuttering under two conditions. Two groups of 18 subjects untrained in speech pathology participated in this study. One group was instructed to "identify stuttering" and the other was given a definition of stuttering to follow during their judgments. The subjects were required to listen to each speech sample (five minute audiotapes of stutterers) three times and mark instances of stuttering on transcripts. The subjects were
instructed to change any judgments on the second and third presentation if necessary.

It was found that the group given the definition marked significantly more words as being stuttered than the group without a definition. It was also found that agreement among judges was low for both conditions, both between subjects and within the same subject (Martin and Haroldson, 1981).

It was speculated in conclusion that "it may be helpful to view the identification of stuttering as a threshold phenomenon" (Martin and Haroldson, 1981, p. 62). This meant that under some circumstances certain behaviors may be viewed as stuttering, but under different circumstances the same behaviors may not be viewed as stuttering. It depended on the "observer's threshold for identifying stuttering" (Martin and Haroldson, 1981, p. 62). In this study, certain words that resulted in high reliability were studied. It was suggested that these words were identified as stuttering more consistently because "the various interruptions contained the right behaviors and combinations of behaviors to reach or exceed the stuttering identification thresholds of all or most of the observers" (Martin and Haroldson, 1981, p. 62).

Kully and Boberg (1988) investigated inter- and intrajudge reliability among professionals in the field of speech-language pathology from different areas or clinics.
These professionals were required to count the total number of syllables and stutterings in a speech sample and also to rate the severity.

The nine forms that were returned were divided into two groups by the investigators. The two groups were determined by whether the subjects counted "number of syllables stuttered" or "number of syllables disfluent." The subjects were asked to "count the total number of syllables spoken in each sample, count the number of stuttered syllables in each sample and to rate the speakers on a seven-point stuttering severity scale" (Kully and Boberg, 1988, p. 314). They obtained low agreement on all three measures. It was suggested that the disagreement in the number of syllables may have been due to some of the subjects counting the repeated units of speech. It was also stated that their results did not support previous studies that were cited with regard to high interjudge reliability when counting number of stutterings. Instead, it was found that clinicians varied in the number of total stutterings counted (Kully and Boberg, 1988).

Finally, there was low agreement with regard to the severity rating of the samples among the subjects. Suggestions were given that may explain the differences such as the quality of the recording of the speech sample, the type of speech sample and the auditory only observation of the speech sample. Another suggestion for the discrepancy
between clinics was that each clinic operated using its own definition of stuttering (Kully and Boberg, 1988).

A study by Zebrowski and Conture (1989) measured the judgments of five types of disfluency (sound prolongations, sound/syllable repetitions of varying durations, whole word repetitions, broken words and interjections) by mothers of stutterers and nonstutterers. The mothers were instructed to listen to 400 utterances paying special attention to the third word in each utterance. Following each utterance, they were required to determine whether the third word was "stuttered" or "not stuttered" by filling in a corresponding oval on a test sheet. No information regarding stuttering was provided.

Significant differences were not found between the two groups of mothers regarding their judgments. It was noted that both groups of mothers identified sound or syllable repetition and sound prolongations as stuttering more often than whole word repetitions and "broken words."

"Sound/syllable repetitions of two or more iterations were judged to be stuttered an average of 93% of the time" (p. 625). Sound prolongations were judged to be stuttered 25% of the time when duration was an average of 258 ms and 65% of the time when prolongation duration was an average of 1254 ms. They also judged interjections not to be stuttered most of the time (Zebrowski and Conture, 1989).
Most recently, Moore and Perkins (1990) studied reliability of nonstuttering subjects and a stuttering subject when judging "authentic and simulated stuttering." They found that inter- and intrajudge reliability was at the level of chance. They concluded that it was difficult to determine whether stuttering occurred. They also noted that the stuttering subject from whom the speech sample was obtained did not reliably identify the authentic stutters when listening to the tape, but could reliably identify these events when they were occurring. They suggested that this supported their definition of stuttering as an "involuntary loss of control" (p. 388). Perkins stated that stuttering can only be accurately identified by the stutterer during the moment of stuttering (Perkins, 1990).

Ingham's (1990) comments on these identification studies revealed that there continues to be substantial conceptual confusion about whether stuttering can be distinguished from "nonstuttered" speech. He discussed inconsistencies of methodology in these studies and suggested that there is a need to determine the causes for different findings among researchers.

Ingham (1990) suggested that problems for such disagreements may have been due to several factors. One suggestion was that low interjudge agreements may have resulted from low intrajudge agreements. He mentioned that inaccurate transcripts, the judges' prior training and the
speech samples being observed, "specific instances rather than intervals" may have affected the results (Ingham, 1990, p. 395).

Ingham suggested that one problem may have been due to methodological problems in studies such as the one conducted by Moore and Perkins (1990). Young (1975) addressed the differences in reliability when different methods were adopted. He stated that there was good agreement with regard to the total words marked even though there was low agreement on the specific words marked. "It was understandable how some investigators may have reported high reliability for marking moments of stuttering when the reliability index is based on total words marked rather than on a word-by-word basis" (Young, 1975, p. 534).

Ingham (1990) also stated that "Kully and Boberg's (1988) study, which Dr. Perkins cited as a basis for doubting even the reliability of listeners' total stuttering counts, perfectly illustrated the lack of concern for careful control in research on this topic" (Ingham, 1990, p. 395). He discussed the fact that conditions in which the judgments were made were not controlled for in Kully and Boberg's (1988) study. He said that reliability differences may have been due to differences in these conditions. This study was important because it revealed that there were large differences between clinics which showed that there is
a need to determine "a methodology for measuring stuttering reliably" (Ingham, 1990, p. 396).

Because naive listeners, professionals, mothers and stutterers themselves are said to be uncertain about what stuttering is, the standard inference is that one might expect parents and professionals to find stuttering identification difficult, especially in young children (Adams, 1984; Onslow, 1992; Gordon and Luper, 1992). However, it is relevant to note that studies of interruptions in the normal speech of young children also provide information on the ease with which stuttering is identified.

Bjerkan (1980) reported the frequency of various disfluencies in the speech of 110 nursery school children who were identified as normal speakers by teachers, parents and the experimenter. "Word fragmentations" were rare; these were described as "a fragmentation of a word before the whole word was produced and included part word repetitions, sound prolongations, blockings and interjections within words" (p. 138). It was not intended in this investigation to study the speech of stuttering children, but two of the subjects were identified as stutterers during the course of the investigation. This presented an opportunity to observe the differences in the speech of these children and the normally disfluent children. "Word fragmentations" were found to be the
characteristic feature that distinguished stutterers from nonstutterers in this study. There were "virtually no word fragmentations in the speech of the normally disfluent children" (Bjerkan, 1980, p. 140). It was concluded that word fragmentations may be a useful index in the identification of stutterers. Stuttering identification for these two children did not appear to be difficult for parents and others.

Yairi (1981) also studied the speech of normally speaking children. He described the disfluencies that were typical in the speech of these children and he found that disfluencies occurred infrequently and were short in duration. Single syllable word repetitions, part-word repetitions, revisions and interjections were most typical. It was stated that "the most important conclusion that can be derived from analysis of the data is that the concept of normal disfluency should not be mistaken to mean a frequently occurring or a predictable average behavior" (Yairi, 1981, pp. 494-495). It is important to note that none of these children who had frequent disfluencies were considered to be stuttering.

This diversity in the literature on the topic of identification of stuttering may affect the assessment and management of the disorder. For this reason, resolution of the issue is necessary.
Categorization

There is a central issue, categorization, that has been ignored in the literature on stuttering identification. While some experimental evidence suggests that stuttering is difficult to distinguish from normal speech, casual and clinical evidence supports the interpretation that stuttering is quickly and easily identified. Stuttering may or may not be a readily known category, but it would seem wise to consider extant evidence on human categorization as relevant to this issue.

"Categorization is not a matter to be taken lightly. There is nothing more basic than categorization to our thought, perception, action, and speech" (Lakoff, 1987, p. 5). Because categorization is so important in our lives, there has been extensive research on the topic. Many researchers have investigated categorization for common objects, events, speech and several other aspects of our environment (Brown, 1958; Rosch, 1975; Rosch et al., 1976; Rosch and Lloyd, 1978; Anglin, 1977; Mervis and Crasafi, 1982; Barr and Caplan, 1987; Brown et al., 1987; and Lakoff, 1987).

The classical theory of categorization groups objects or events together according to shared properties. This view has been around for several centuries and for a long time had not been debated in the field of psychology or related fields (Lakoff, 1987). Just in the past few years,
several theories of categorization have emerged and been investigated which take the view that categories have internal organization of members and that all members may not be equal examples of the category (Rosch, 1975; Rosch et al., 1976; Rosch and Lloyd, 1978; Medin and Schaffer, 1978; Barr and Caplan, 1987; Lakoff, 1987; and McCloskey and Glucksberg, 1987).

"Prototype theory" (Rosch, 1975; Rosch et al., 1976 and Rosch and Lloyd, 1978) is the theory of interest for this study. Rosch (1978) described categories through "vertical dimensions" which consisted of superordinate, basic and subordinate levels. The internal structure of categories which focused on "prototypes" was also described by Rosch (1987). Prototypes are "the clearest cases of category membership in the category...which appear to form in such a manner as to maximize information-rich clusters, cue validity and category resemblance of attributes of categories within categories" (Rosch, 1978, p. 37). "Her research on prototype effects was aimed at showing asymmetries among category members and asymmetric structures within categories" (Lakoff, 1987, p. 40).

Rosch et al. (1976) discussed levels of abstraction within categories. Rosch (1978) described three levels of abstraction in her theory of categorization. Her research focused on "basic-level" categories.

In taxonomies of concrete objects, there is one level of abstraction at which the most basic
category cuts are made. Basic-level categories are those which carry the most information, possesses the highest category cue validity, and are, thus most differentiated from one another (Rosch et al., 1976, p. 382).

Superordinate categories and subordinate categories have lower cue validity than basic level categories. Members of a superordinate category, such as furniture, have less in common than members of a basic level category, such as chair. Subordinate category members share most of the same features as other subordinate categories under the same basic level category, such as kitchen chairs and lawn chairs (Rosch, 1978).

In 1976, Rosch et al. performed twelve experiments which explored basic-level categories. The first four experiments involved operationally defining basic-level categories (Rosch et al., 1976).

The first experiment was concerned with attributes of common objects. Subjects were instructed to "write down all the attributes of each object they could think of." Another group of subjects was then asked to review the lists of attributes and determine if the attributes were representative of the objects. They found that significantly more attributes were used for the basic level objects than superordinate and that significantly fewer attributes were added to the subordinate level objects than the basic level objects (Rosch et al., 1976).
The second experiment tested the hypothesis that "basic level objects are the most inclusive categories for which highly similar sequences of motor movements are made to objects of the class" (Rosch et al., 1976, p. 393). Subjects in this study were required to write down the sequence of movements that a person makes when interacting with the object. The written name of each object was given. It was found that there were significantly more movements in common for basic level objects than superordinate level objects. For example, lists of motor movements were more inclusive for a basic level object, a guitar, than its superordinate object, a musical instrument. Movements listed for a subordinate object, such as a folk guitar or classical guitar, were not significantly different from the movements listed for the basic level object, a guitar. The basic hypothesis was supported (Rosch et al., 1976).

The third and fourth experiments in this study dealt with the shapes of objects at the three levels of abstraction. In experiment three, overlap ratios of pictures of superordinate, basic and subordinate level objects were determined. That is, pictures of objects at each level of abstraction were oriented similarly and normalized to size. Outlines of the objects were then traced. The tracings were overlapped and ratios of overlap were determined by computer.

A large and consistent increase in similarity of the overall look of objects (as measured by
increase in the ratio of area of overlap to nonoverlap of normalized shapes of the objects) was obtained for basic level over superordinate categories. A significantly small increase in similarity was obtained for subordinate over basic level categories (Rosch et al., 1976, p. 403).

In experiment four, outlines of pictures of objects were averaged as in experiment three. Instructions for the basic level objects were to "circle the category to which you think the object belongs" and to "write your best guess about what the object is after the name of the category which you have circled" (p. 404). For the superordinate objects, the subjects were told that the pictures were of two pictures averaged together, and they were instructed to guess the names of each of the two pictures after the category had been chosen (Rosch et al., 1976).

The results revealed that identification for the superordinate categories did not exceed chance when different basic level shapes were averaged. A significant number of identifications were made at the basic level and subordinate averages were not identified significantly more than basic level averages (Rosch et al., 1976). "Common attributes, common movements, similarity in shape and identifiability of averaged shapes" contribute to an operational definition of the level of abstraction (Rosch and Lloyd, 1987, p. 31).

A second part of the investigations of Rosch et al. (1976) focused on "some implications of basic level objects." Experiments were conducted to determine whether
"objects were generally first seen or recognized as members of their basic level category" and "whether basic object names are the lexical items normally chosen to refer to any given concrete objects" (Rosch et al., 1976, pp. 406-407).

The first experiment was designed to measure reaction time of subjects when determining category membership of basic, superordinate and subordinate categories. Subjects were required to listen to a name of an object and then look at a picture and decide whether the picture belonged to the category named. They found that subjects responded faster to the basic level categories than superordinate and subordinate categories and that responses to superordinate categories were faster than those to subordinate categories (Rosch et al., 1976).

Another investigation was designed to determine whether subjects name objects at the basic level of abstraction. Subjects were required to name pictures of objects from the three different levels of categorization. The results showed that "there was virtually total agreement in the use of basic level names for the objects" (Rosch et al., 1976, p. 424).

The development of categorization in children has also been the focus of several investigations (Brown, 1958; Rosch et al., 1976; Anglin, 1977; Mervis and Crasafi, 1982; and Brown et al., 1987). Results from these investigations revealed that children as young as thirty months were able
Rosch et al. (1976) performed experiments to test the hypothesis that children should develop the ability to match at the basic level of categorization before the superordinate and subordinate levels. Triads of pictures were presented to the children, ages 3 through 10. The instructions were to match "the two pictures that were alike or that are the same kind of thing" (p. 417). It was found that the children were correct significantly more often for the basic level matches than for superordinate levels (Rosch et al., 1976).

Following this task, children were presented with the final six triads. They were reminded of their match and were required to state why they had matched the two pictures. This was done to determine the role of language development on the results (Rosch et al., 1976).

The sorting task in this investigation showed improvement with age for the superordinate level items. It was shown that children as young as three years of age sorted items at the basic level. It was also shown that the subjects' ability to match basic level items accurately was not simply due to language development (Rosch et al., 1976).

Mervis and Crasafi (1982) also investigated categorization in children. They tested the hypothesis that
the ability to categorize would develop in the following order: basic level, superordinate and subordinate. The sorting task in this investigation differed slightly from the task employed by Rosch et al. (1976) in that items in the triad were taken from the same level of abstraction. That is, subordinate sets included three objects of the same basic level category, basic level sets included three objects of the same superordinate category and superordinate sets included two objects of basic level categories under that superordinate and one object from another superordinate category (Rosch et al., 1976).

Subjects in this study were three groups of children, 2-6-year-olds, 4-year-olds and 5-6-year-olds. Subjects were instructed to choose from a choice of three picture cards which cards were "the same kind of thing, which ones went together." The results illustrated that all children performed significantly above the level of chance for the basic level triads. The 4-year-olds performed significantly better than chance for the basic level and superordinate sets and that 5-year-olds performed above the level of chance for all three category sets. Their prediction of the order of development of the levels of categorization were confirmed by these results (Mervis and Crasafi, 1982).

Brown, Brown and Robinson (1987) replicated the study by Rosch et al. (1976). Like Mervis and Crasafi (1982), they also changed the stimuli to include items from the same
superordinate categories in the triads. Their results also revealed that subjects made basic level matches with significant accuracy (Brown et al., 1987).

Brown et al. (1987) tested categorization in preschoolers, school-age children and adults. Two experiments were conducted. In the first, preschool children were instructed to choose two pictures that "went together or were alike in some way and were the same kind of thing" from a triad. The children were 90% accurate in making basic level matches. A significant difference was found between basic and nonbasic level matches which showed that the young children categorized at the basic level for this task (Brown et al., 1987).

In the second experiment, preschool children, school-age children and college students were presented a target picture and were instructed to choose from two other pictures the "one that went with" the target. Subjects were required to name the pictures used following completion of the task. Stimuli were constructed that dealt with visual and behavioral similarities as well as different levels of categorization. For example, for one set, the target picture was a sitting boy. Its alternative non-basic-level match may have been a walking girl and its alternative basic-level match may have been a dancing boy. It was predicted that visual and behavioral similarities of the
stimuli would cause the younger children to make more nonbasic level matches (Brown et al., 1987).

The results confirmed this prediction. "Preschool children made significantly more non-basic level choices than school-age children or adults" (p. 251). There was no significant difference between the non-basic level choices of school-age children and adults. Visual and behavioral similarity effects were not significant. This second experiment demonstrated that preschool children’s categorization at the basic level was no better than chance. The authors said that two possible methodological reasons (instruction and stimulus characteristics) may have been responsible for the discrepancy (Brown et al., 1987).

Some studies on categorization in children focused on the naming of objects (Brown, 1958 and Anglin 1977). Brown (1958) described words that children used to name categories. The types of words used by children were basic level category words. He gave the example of a dime. He explained that "it is also money, a metal object, a thing, and moving to subordinates, it is a 1952 dime, in fact a particular 1952 dime with a unique pattern of scratches, discolorations and smooth places" (Brown, 1958, p. 14). He also used the name 'pineapple' as an example.

The thing called a pineapple is also a fruit. Fruit is the shorter and more frequent term, but adults will name the thing pineapple. Similarly, they will say apple, banana, orange and even pomegranate; all of them longer and less frequent
Brown (1958) described names at all three levels of abstraction and showed that the most likely term to be used was the label at the basic level of categorization. Anglin (1977) also investigated naming of objects by children and found that the child's "first common nouns tend to cluster at some intermediate level of generality which classifies the world into categories which are not too big, but then again, not too small" (p. 89).

All of the evidence cited concerns categorization of visual events. It would be interesting to determine whether acoustic events (e.g., abnormal speech) are also categorized in a prototypic, basic level manner. With respect to stuttering, if this is a basic level category, listeners would rarely apply a superordinate label (i.e., "abnormal speech") or a subordinate label (i.e., "syllabic repetitions"). Instead, a basic level label (i.e., "stuttering") would be used.
CHAPTER III
STATEMENT OF THE PROBLEM

Due to the several opinions of scholars and diverse findings in research, currently no definition of stuttering is shared by all individuals in the profession of speech-language pathology. Because of this, a controversy in the identification of stuttering exists. This controversy may affect the identification of stuttering attendant research.

Clinicians in the field of speech-language pathology review the literature and decide which view applies best to their clinical experiences regarding the assessment and treatment of stuttering. Inconsistencies in the assessment and treatment of stuttering from clinic to clinic may be resolved if the "ease of identification" problem is clarified.

One view of the stuttering identification evidence is that there is considerable lay and expert confusion about the defining features of stuttering. From this perspective, "stuttering" may be an invented category that is not reliably attached to a particular manner of speech.

Another perspective is that stuttering identification is not particularly challenging. From this perspective, a basic level term is applied reliably when prototypic stutters are heard. This view would predict that accurate stuttering identification presents no difficulty.
Although adults have been asked to judge whether a disfluent moment is stuttering or normal speech, the stuttering identification (categorization) task has not been presented to young children.

In the present study, children will listen to fluent phrases, phrases containing stutters (syllable repetitions) and phrases produced with vocal hoarseness. The task is to indicate whether each phrase is "okay" or "not okay." The prediction to be tested is that children will be able to distinguish between these three types of phrases. The null hypotheses are, as follows:

1. Children will accept all three types of phrases as "okay" with equal frequency.
2. If hoarse and stuttered phrases are identified as "not okay," children will use non-distinguishing labels for both types of phrases.

If stuttering is difficult to identify, then very young children will not respond differently to utterances containing stuttering and fluent utterances. However, if stuttering is easy to identify as a "basic level category" for young children, they will use the label "stuttering" or another label consistently to represent the utterances containing syllabic repetitions.

The purpose of this investigation is to determine whether young children are able to identify stuttering and whether they consider stuttering to be categorically
different from normal speech. It is also an attempt to determine whether the event of stuttering is ambiguous. If children do not notice stuttering in the utterances, then this may suggest that stuttering is not categorically different from fluent speech and may not be noticed because it is perceived as part of normally disfluent speech. This would suggest that stuttering is an ambiguous event. If the children notice stuttered events, this may suggest that the event of stuttering is categorically different from normally disfluent speech due to the fact that it was apparent to the children that there was a difference in the utterances. This may also suggest that the events representative of stuttering are not ambiguous.
CHAPTER IV

METHODOLOGY

Subjects

Twenty-nine nonstuttering 5-6-year-old white male children were selected from several preschools in Lubbock, Texas, to participate in this study. Prospective subjects were given a consent form to be filled out and signed by a parent or guardian. The subjects were included in the study if they were among the first 29 children to become available through consent of the parent or guardian. Each subject was assigned a number which was used to insure confidentiality. Before collecting the data, each subject was required to pass a pure tone hearing screening to confirm normal hearing acuity. Two of 29 subjects did not complete the entire task and were dismissed from the study. This resulted in a total of 27 subjects for this investigation.

Instrumentation

A cassette audiotape was used to present the demonstration and test items to the subjects. A microphone was attached to a second tape recorder which was used to record the subjects' responses.
Speech Sample

An audiotape of 40 utterances was produced by a male speaker with a Ph.D. in Speech and Hearing Sciences (see Appendix). This tape was constructed using a Sony cassette tape recorder. The speech sample consisted of 20 fluent utterances and 20 utterances that contained stuttering. Two instances of clonic repetition occurred in each of the 20 stuttered utterances. Of the 20 fluent utterances, four were produced with a hoarse vocal quality to determine whether subjects distinguished between these and stuttered utterances.

Three to four repetitions of the beginning sound or syllable, produced easily, rhythmically and with continuous phonation, were used to represent stuttering in the twenty utterances. Sound/syllable repetitions represented one of the "cardinal features" in the speech of stutterers as defined by Wingate (1964). Repetitions of this type were also considered to be "focal exemplars" of stuttering which were defined by Hamre (1992) as "good examples" of stuttering as opposed to "peripheral exemplars" which were described as examples of stuttering which were not typical of what would be regarded as stuttering or which would be "bad examples" of stuttering (Hamre, 1992).

The four utterances which were produced with hoarse vocal quality were used as foils. The foils were included to determine whether the subjects recognized these as
different from the normally fluent and stuttered utterances. These were also used to determine whether subjects labeled these differently from the 20 stuttered utterances.

**Procedures**

Subjects were escorted individually to a quiet room within the facility where data collection took place. The environment was controlled as much as possible for noise and other distractors. A hearing screening was conducted at 25dB for 500, 1000, 2000 and 4000 Hz bilaterally to confirm normal hearing acuity.

Each subject was then seated across from the experimenter at a table or on the floor. The tape recorder which was used for presentation of the demonstration and test items was placed in front and to the left of the subject. The tape recorder used to record the subject’s responses was placed in front of and to the right of the subject. The microphone which was attached to this second recorder was placed approximately three feet from the subject’s mouth and was positioned on a soft surface (a folded towel).

Sixteen demonstration items were presented to each subject to determine understanding of the task. Of the 16 demonstration items, two were produced very quickly, one was produced with a "drawl," three were produced with hoarse vocal quality, three contained instances of stuttering and
seven were fluent and spoken with normal rate and vocal quality. These demonstration items were used to facilitate subjects' attention to the manner in which an utterance was spoken rather than the content of the utterance.

Instructions (described below) were similar for these demonstration items and the test items. The subject was required to decide if an utterance was "okay" or "not okay" and also to label the "not okay" exemplars.

The subject was asked to listen to two demonstration items which were presented one after the other. One of the utterances was fluent and the other was produced with a rapid rate of speech. The subject was then told, "Listen to that again. Tell me which one is said okay and which one is not okay". The first utterance was presented and then the subject was required to decide whether it was "okay" or "not okay." The second item was then presented and the subject was required to do the same thing. The first two were presented together to demonstrate that the way a person speaks can be "okay" which was represented by the normal, fluent utterance or "not okay" which was represented by the very fast utterance. The two were presented together to give the subject a referent to what was "okay" for the person producing the utterances.

The third utterance presented was fluent. If the child labeled the utterance as "not okay," the experimenter asked, "Why is that not okay?" Then the experimenter asked, "Is
the way he is talking not okay?" This was asked so that the subject would understand that he was to attend to the way in which the utterance was produced. If the subject continued to label this as "not okay," the experimenter said, "I think that one is okay, don't you?" If the subject did not agree that the utterance was "okay" compared to the "not okay" utterance, it was felt that the subject was not able to perform the task required. None of the 29 original subjects were dismissed for this reason.

Next, the utterances produced fast, with a drawl, with a hoarse vocal quality and those containing stuttering were presented. When the subject responded by saying, "I don't know" to the second question ("What would you call that?"), the experimenter said, "People have names for that way (i.e., hoarse) of talking. Some people might call that rough, hoarse or scratchy. Listen again." After presentation of the same item, the experimenter asked, "What should we call that?" If the subject created a label or chose a label that was provided, the next demonstration item was presented. If the subject responded by saying, "I don't know," the experimenter again explained that "people have names for that way of talking. Sometimes they call that rough, hoarse or scratchy. What name should we use?" If the subject did not respond or choose a label, the experimenter said, "Should we use rough, hoarse or
If the subject still did not choose a label, the next demonstration item was presented.

The set of labels used for the hoarse voice was "rough, hoarse or scratchy." "Fast or quick" was the set of labels used for the utterance produced at a very rapid rate. The set used for the utterance produced with a "drawl" was "drawl or slowpoke." The set of labels used for stuttering was "stumbling, stuttering or chattering."

Each subject was then required to listen to the forty test utterances and determine whether the utterance was "okay" or "not okay." The subjects were instructed as follows:

"You are going to hear a person saying things on this tape. Sometimes the way he says things is 'okay,' but sometimes the ways he says things is 'not okay.' I want you to tell me if you hear the person say things 'okay' or 'not okay.' All you have to do is say 'that's okay' or 'that's not okay.'"

A pause was created by depressing the pause button on the tape recorder between each utterance during which the subject was to state whether the utterance was "okay" or "not okay." If the response was "not okay," the subject was asked to supply a label for the manner in which the utterance was produced. The subject was asked one of the following questions: "What is that called?", "What is
that?", "What do we call that?" or "What is the name for that?" If the response was vague, such as, "It sounds funny," the subject was asked, "What do you call that?" No labels were provided during presentation of the test items.

Non-informative feedback was given ("Okay. Listen to the next one.") after each response. If the subject did not respond during the pause, the examiner asked, "Was that okay or not okay?" NR was recorded for "no response" following this prompt. Two of the 29 subjects did not complete the entire task and were dismissed from the investigation.

If the subject was responding as required, the next utterance was presented, following the subject's response, by releasing the pause button on the tape recorder. This same set of procedures was repeated until all 40 utterances were presented. The stimuli and subjects' responses were recorded by a second audiotape recorder.
CHAPTER V
RESULTS AND DISCUSSION

The first question of this study dealt with the ability of young children to identify stuttering. This was determined by calculating the accuracy of subjects' responses to fluent and stuttered utterances. Correct responses to all 40 utterances, for example, would reveal that the subject always responded differently to the stuttered and fluent utterances.

The number of overall correct responses for the group of children was tabulated and averaged. Of a possible 40 correct responses, the mean number of correct responses for the group of five- and six-year-old subjects (36.48) was not different ($t_c=3.25, p > .001$) from the average total number of correct responses possible (40). The group was 91.2% correct in its responses to the 40 utterances. There was no difference between the number of correct responses for the group of subjects and the number of correct responses possible, which shows that the children correctly responded to and identified stuttered, hoarse and fluent utterances as being categorically different.

The number of correct responses to the stuttered utterances only was also tabulated and averaged. Of a possible 20 correct responses, the mean number of correct responses for the group of five- and six-year-old subjects
(17.63) was not different \( (t_c = 2.30, p > .001) \) from the average total number of correct responses possible to stuttered utterances (20). The group was 88.2% correct in its responses to the twenty stuttered utterances. This, again, shows that the children correctly responded to and identified stuttered utterances.

The difference between the responses of the five-year-old subjects and the six-year-old subjects was also determined for the stuttered utterances. The mean number of correct responses of the group of five-year-olds was 16.54 (83.7% correct). The mean number of correct responses of the group of six-year-olds was 18.64 (93.2% correct). These mean values were not significantly different \( (t_c = 0.2855, p > .001) \). This indicates that there was no difference in the responses of the five- and six-year-old subjects in this investigation.

The second part of this investigation focused on labels given for stuttered and hoarse utterances by subjects. Table 1 lists the labels used to identify stuttering. The frequency with which each label was used out of a possible total of 540 is also listed. "Stuttering," "Chattering" and "Scratchy" were examples provided during demonstration and the three most frequently used labels to name stuttering. The label "stuttering" was given 32% of the time for utterances containing clonic repetitions. "Chattering" was the second most frequent label given for these utterances.
Table 1. Labels used to identify stuttering and frequency of use.

<table>
<thead>
<tr>
<th>Label</th>
<th>Frequency *</th>
<th>Children #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stuttering/Stutter</td>
<td>172</td>
<td>9</td>
</tr>
<tr>
<td>Chattering</td>
<td>86</td>
<td>5</td>
</tr>
<tr>
<td>Scratchy/Scratch</td>
<td>31</td>
<td>2</td>
</tr>
<tr>
<td>Stumbling</td>
<td>24</td>
<td>3</td>
</tr>
<tr>
<td>Hoarse</td>
<td>23</td>
<td>4</td>
</tr>
<tr>
<td>Blabber</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>Silly</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>Drumbling</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>Tumbling</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>Tooth Talk</td>
<td>19</td>
<td>1</td>
</tr>
<tr>
<td>Rumbling</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>Scumbling</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Rough</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Stumping</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Funny</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Stepping</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Stopping</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Wopping</td>
<td>1</td>
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<td>1</td>
</tr>
<tr>
<td>Itchy</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Grouchy</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>No Label</td>
<td>66</td>
<td>7</td>
</tr>
</tbody>
</table>

* Number of times used of a possible 540.
# Number of children using label.
"Scratchy" was used 6% of the time and was the third most frequently used label.

The labels, "stuttering," "chattering" and "stumbling," were those provided by the experimenter during the demonstration segment of this study. In short, more than half (282 of 540) of the stuttered utterances were identified by labels presented during the demonstration segment.

Table 1 also shows the number of subjects using a specific label. The label "Stuttering" was used by nine different subjects. Seven of these subjects used the label consistently for all 20 stuttered utterances, one used it 19 out of 20 times and one subject used it 13 out of 20 times. The label "Chattering" was used by five different subjects. Four of these subjects used it consistently for all 20 stuttered utterances and one subject used it 6 times out of 20. The label "scratchy" was used by two subjects, "stumbling" by three subjects, "hoarse" by four subjects and all other labels were used by one subject.

Twenty of the 27 subjects used a consistent label 15 times or more out of a possible 20 for the stuttered utterances. Eighteen of these subjects used a different label for the utterances produced with hoarse vocal quality and two used the same label for both types of utterances. Eighteen of the 27 subjects used a consistent label for the stuttered utterances 17 times or more. The label
"stuttering" or a form of the word was used to label the event by 9 of the 27 subjects. All of these subjects using this label used a different consistent label for the utterances produced with hoarse vocal quality. Because 74.0% of the children labeled the stuttered utterances consistently, this also shows that these children identified the stuttered utterances and considered them to be categorically different from fluent and hoarse utterances.

Table 2 lists the labels given for the utterances produced with hoarse vocal quality. The three most frequent labels used were "rough," "scratchy" and "chattering." "Rough" was used 17% of the time, "scratchy" was used 11% of the time and "chattering" was used 10% of the time. Six subjects used the label "hoarse", five subjects used "rough" and five more used "scratchy" to identify hoarse utterances. "Chattering" was applied as a label by three subjects, "grouchy" by two subjects and "sick" by two subjects. Each of the 15 remaining labels applied to the hoarse utterances were used by 15 different subjects (one label for each subject). Twenty-two of the 27 subjects used a consistent label (3 of 4 times) for the hoarse utterances. This shows that children identified this type of speech as being categorically different from fluent speech and speech containing clonic repetitions.

The labels, "rough," "hoarse" and "scratchy," were those provided for the demonstration items. Less than half
Table 2. Labels used to identify hoarse utterances and frequency of use.

<table>
<thead>
<tr>
<th>Label</th>
<th>Frequency</th>
<th>Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rough</td>
<td>18</td>
<td>5</td>
</tr>
<tr>
<td>Scratchy</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>Chattering</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>Hoarse</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Grouchy</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Sick</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Mad</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Monster/Alien</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Yucky</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Greedy</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Silly</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Drawl</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Horse Stepped On</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Blabbermouth</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Weird Talking</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Scumbling</td>
<td>2</td>
<td>1</td>
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<tr>
<td>Talking Mean</td>
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<td>1</td>
</tr>
<tr>
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<td>1</td>
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<td>1</td>
</tr>
<tr>
<td>Stumbling</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Trampling</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>No Label</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

* Number of times used of a possible 108.
# Number of children using label.
(40 of 108) of the hoarse utterances were identified using these labels.

Table 3 lists the labels that were used by subjects for both stuttered and hoarse utterances. The frequency and percentage of label use applied to both types of utterances are listed in this table. Of the three most frequently used labels for stuttering, the label "stuttering" was used once, the label "chattering" was used eleven times and the label "scratchy" was used twelve times to also identify hoarse utterances. Of the three most frequently used labels for the hoarse utterances, "rough" was used four times, "scratchy" was used 31 times and "chattering" was used 86 times to also identify stuttered utterances out of a possible 540 times the label could be used.

"Stuttering" was the most recurrent label used for clonic repetitions. "Rough" was most recurrent for hoarse speech. The percentage that "stuttering" was used to label stuttered utterances (31.9%) far exceeded the percentage this label was used to label hoarse utterances (00.9%). The percentage that the label "rough" was used to identify hoarse utterances (16.7%) was also much higher than the percentage that the same label was used for stuttered utterances (00.7%). These results indicate that the most popular label for each type of speech was used significantly more often for that type of speech than for the alternative type of speech.
Table 3. Frequency and percentage with which subjects used certain labels for stuttered and hoarse utterances.

<table>
<thead>
<tr>
<th>Label</th>
<th>Stuttered</th>
<th>Percent S.</th>
<th>Hoarse #</th>
<th>Percent H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stuttered</td>
<td>172</td>
<td>31.9</td>
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<td>00.9</td>
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<tr>
<td>Chattering</td>
<td>86</td>
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<td>Scratchy</td>
<td>31</td>
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<td>11.1</td>
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<tr>
<td>Hoarse</td>
<td>23</td>
<td>04.3</td>
<td>10</td>
<td>09.3</td>
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<tr>
<td>Silly</td>
<td>20</td>
<td>03.7</td>
<td>4</td>
<td>03.7</td>
</tr>
<tr>
<td>Tumbling</td>
<td>20</td>
<td>03.7</td>
<td>1</td>
<td>00.9</td>
</tr>
<tr>
<td>Scumbling</td>
<td>10</td>
<td>01.9</td>
<td>2</td>
<td>01.9</td>
</tr>
<tr>
<td>Rough</td>
<td>4</td>
<td>00.7</td>
<td>18</td>
<td>16.7</td>
</tr>
<tr>
<td>Grouchy</td>
<td>1</td>
<td>00.2</td>
<td>8</td>
<td>07.4</td>
</tr>
<tr>
<td>No Label</td>
<td>66</td>
<td>12.2</td>
<td>4</td>
<td>03.7</td>
</tr>
</tbody>
</table>

* Times used out of a possible 540.
# Times used out of a possible 108.
CHAPTER VI
CONCLUSIONS

The first question of interest in this investigation concerned the identification of stuttering by young children. The results showed that this group of children (5- and 6-year-olds) was 91.2% correct in response to the 40 utterances and 88.2% correct in identifying utterances containing clonic repetitions. By determining whether the utterances were "okay" or "not okay," the children distinguished categorically between fluent and stuttered utterances.

The second question of concern in this investigation focused on the nature of categorization of stuttering by the subjects. The subjects were required to label the utterances that were determined to be "not okay." With limited exposure to stuttered speech in the demonstration items, it was expected that young children would not have a consistent label to use for clonic repetitions. The results showed that 20 of the 27 subjects (74.1%) used a consistent label for the stuttered utterances. It was also found that 19 of the 27 (70.1%) subjects used a consistent label for the hoarse utterances. Of the 20 using a consistent label for stuttering, 18 of these subjects used a different label for the hoarse utterances. This also suggests that these
subjects were able to distinguish categorically between the hoarse and stuttered utterances.

The results of the labeling portion of this investigation suggest that "stuttering" was not a basic level class label for most of these children. Even though this label was applied to stuttered utterances more frequently than any other label, very few of the subjects used the label prior to its exposure during the demonstration session. The high frequency of use may be an example of "fast mapping." "Fast mapping occurs when a child encounters a novel word and uses the linguistic and nonlinguistic context in which the word occurs to rapidly acquire information about its meaning" (Heibeck and Markman, 1987, p. 1021). Dollaghan (1985) conducted studies on "fast mapping" and discovered that very young children fast mapped unfamiliar words after one or very few exposures to the word.

This may have been the case with some of the subjects in this study. They may have used the information obtained in the demonstration session and applied the label to the test items. The three labels, "stumbling, stuttering and chattering," were used in the demonstration items. These three labels were used more than half of the time (282 of 540) to identify stuttered utterances. Of the 282 times these labels were employed, "stuttering" was used 172 times.
"Fast mapping" suggests that stuttering is clearly different from fluent utterances.

Fast mapping was not nearly as common for the hoarse utterances as for the stuttered utterances. The label "stuttering" was mapped quickly and reliably. The three labels used in the demonstration session for the hoarse utterances were not used with the same frequency as the three labels given for stuttering.

Implications

The results of this investigation may also provide information to answer other questions on categorization and identification of stuttering. Is stuttering a basic level category? Are clonic repetitions "prototypic" of stuttering? Is the label, "stuttering," a basic level class label? If "stuttering" is a basic level class label, when in development of children does it emerge? Is it likely that parents will make mistakes when identifying stuttering in their children?

Rosch et al. (1976) stated that "for categories of concrete objects, basic objects are the most general classes at which attributes are predictable, objects of the class are used in the same way, objects can be readily identified by shape, and at which classes can be imaged" (p. 435, underlines added). It was also found that the frequency with which subjects label objects using basic level class
names was significant for the group of subjects (Rosch et al., 1976).

Although further research on the topic is necessary, these results may provide information for determining whether stuttering is a basic level category. The label "stuttering" was the most frequently used label for the utterances containing clonic repetitions. Subjects identified stuttered utterances accurately which may suggest that the attributes of stuttering which were observed may have been predictable. And although it is difficult to determine shape of an utterance, the fact that clonic repetitions were used for all instances of stuttering may suggest that this type of speech is identifiable by its shape or how it is produced. According to the research by Rosch et al. (1976), these results may suggest that stuttering is an emerging basic level category.

Further research is also necessary to determine what is prototypic of stuttering. The fact that clonic repetitions were accurately identified as being categorically different from fluent speech may suggest that they are prototypic of stuttering. Prototypes "maximize information-rich clusters of attributes, cue validity and category resemblance" (Rosch et al., 1978, p.37). Further research may focus on different types of stuttering, tonic versus clonic, different durations of the stuttered event, the degree of aspiration on consonant release, rhythmicity of clonic
repetitions and continuous versus discontinuous phonation during clonic repetitions to determine what is prototypic of stuttering.

In a study by Zebrowski and Conture (1989), mothers of stutterers and nonstutterers judged five types of speech disfluency. Sound/syllable repetitions (clonic repetitions) were judged to be stuttered significantly more often than the other four types of disfluency such as whole-word repetitions, broken words, interjections and sound prolongations. These results also suggest that sound/syllable repetitions or clonic repetitions may be prototypic of stuttering.

Sander (1963) also conducted an investigation to determine listeners' judgments of speech dysfluencies. Differing frequencies of sound/syllable repetitions were used as speech samples to determine the "tolerance" of listeners. The question was "How often may an adult speaker exhibit single- or double-unit syllable repetition instances before listeners will (a) comment upon the presence of the repetitions, (b) consider the speech to be defective, and (c) classify the speaker as a stutterer?" (Sander, 1963, p. 20). It was found that as the frequency of the repetitions increased, judgements of "defective speech" (i.e., superordinate) and "stuttering" (i.e., basic level) increased. This may also support the hypothesis that clonic repetitions may be prototypic categories at the basic level.
An implication of this study is that clonic repetitions may regularly be labelled as "stuttering" by adults, and, if so, that clonic repetitions are prototypic at a basic level. If this is true, adults who hear clonic repetitions may apply the basic level class label, "stuttering," more often than the superordinate class label, "speech problem," or the subordinate class label, "syllabic repetitions."

It was found that young children consistently labeled clonic repetitions. Twenty of the 27 subjects used a consistent label for the stuttered utterances. Nine used the basic level label, "stuttering." This raises a question about basic level categories. Could clonic repetitions have been a stable category for those subjects who identified and labeled these instances consistently with a label other than "stuttering?" These subjects may have had the concept of the category, but not yet had the basic level label. Further research may be conducted on children of different ages to determine when the term "stuttering" becomes a basic level category label in the development of children?

Another implication of the results of the present study is that it is unlikely that parents are mistaken in reporting that their children are stuttering. Since syllabic repetitions were easily identified in this study, it is likely that parents also easily identify aberrant differences in the speech of their children. Zebrowski and
Conture (1989) demonstrated that mothers accurately identified as "stuttering" brief clonic repetitions in the speech of children.

**Limitations**

One limitation of this study may be the prior knowledge of the subjects with regard to stuttering. Some subjects may have had previous interactions with friends and relatives who stutter and this may have enhanced their identification ability. Through a survey, information regarding prior knowledge of stuttering could be used to control this variable.

Another difficulty encountered that may have affected the results was the amount of noise in the environment during testing. Testing was conducted at the several preschools attended by the subjects and control of the environment was difficult.

Future research may control for limitations of this study and further investigate stuttering as being easily identified by children and adults and whether stuttering is a basic level category. If it is determined that stuttering is a basic level category, it should be determined what is prototypic of stuttering within the category. Answers to these questions would expand our knowledge of stuttering and provide information for a universal definition of stuttering.
which may be used by lay persons and professionals to identify the phenomenon.


APPENDIX

DEMONSTRATION AND TEST ITEMS
Demonstration Items

1. I like to play with my puppy.  (fluent)
2. Pigs like to play in the mud.  (fast)
3. I saved all my money to buy a new toy.  (fluent)
4. When I play outside, I am not allowed to go into the street.  (fast)
5. I hope that it doesn’t rain today.  (fluent)
6. Tomorrow, we will go to the pizza place to eat lunch.  (drawl)
7. I was lost at the store and a very nice lady found my mom.  (fluent)
8. I don’t like to eat peas.  (hoarse)
9. My sister took me to see a movie.  (fluent)
10. *My grandma takes me to the grocery store every Saturday.  (stuttered)
11. The sun is shining today.  (fluent)
12. Everybody at school likes to go for a walk to the playground.  (hoarse)
13. Tomorrow is my birthday and I will be five.  (fluent)
14. Mom takes us swimming in a big pool in the summer.  (stuttered)
15. I like the new teacher I have this year for school.  (hoarse)
16. I get up every morning and watch cartoons.  (stuttered)

Test Items

1. The cat chased the mouse.  (fluent)
2. I like to eat cookies and drink milk.  (stuttered)
3. What time are we going to eat dinner?  (hoarse)
4. The girl is playing with the puppy.  (stuttered)
5. The lights went out in the city because of the storm.  (fluent)
6. Put your toys away before dinner.  (stuttered)
7. After school, I will play games with my friends.  (fluent)
8. I hope Johnny wins the race today.  (stuttered)
9. Take an umbrella because it looks like it is going to rain.  (fluent)
10. Bobby found the dog and kept it as a pet.  (stuttered)
11. The boy fell off of his bike and scraped his knee.  (fluent)
12. Two cars crashed, but nobody was hurt.  (stuttered)
13. Mommy and daddy are going out to eat dinner and watch a movie.  (fluent)
14. The boy is playing his radio too loudly.  (hoarse)
15. Our team won the basketball game last night.  (stuttered)

* Underlining indicates location of clonic repetition.
16. Only one ball is needed to play basketball. (fluent)
17. *The painter painted the house blue. (stuttered)
18. It rained and rained all night long. (fluent)
19. The little girl was crying because her puppy ran away. (stuttered)
20. I live in the big, blue and white house on the corner. (fluent)
21. At the fair, we can ride the merry-go-round and the roller coaster. (stuttered)
22. He lost his teddy bear at the supermarket. (fluent)
23. When I grow up, I want to be a doctor. (hoarse)
24. I hope mom makes some chocolate chip cookies to put in my lunch. (stuttered)
25. Can I go outside to play? (stuttered)
26. There are monkeys, lions, tigers and bears at the zoo. (fluent)
27. I gave the dog a big bone and he buried it in the backyard. (stuttered)
28. The lady’s umbrella was blown away by the wind. (fluent)
29. It was time for the children to take a nap. (stuttered)
30. Joey got dirt all over his new clothes. (hoarse)
31. The man that drives the school bus is very nice. (fluent)
32. When my mom and dad go to the grocery store, I get to pick out my favorite cereal. (stuttered)
33. I like to go to school to see my friends. (fluent)
34. I want a new red bike for my birthday. (stuttered)
35. We are going to Grandma’s house for dinner on Sunday. (stuttered)
36. I like to spend the night at my best friend’s house. (fluent)
37. Would you take me to the park to play on the swings? (stuttered)
38. After I take a bath at night, my mom tells me a story and I go to sleep. (fluent)
39. I brush my teeth three times a day. (stuttered)
40. When I go to the doctor’s office, the nurse gives me a lollipop if I don’t cry. (stuttered)

* Underlining indicates location of clonic repetition.