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Concomitant Disorders in School-Age Children Who Stutter

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A consistent finding in the literature on stuttering is that a small but significant percentage of children who stutter exhibit concomitant speech and/or language disorders in addition to their stuttering. Specifically, these concomitant disorders might include articulation/phonological, language, and/or voice disorders as well as learning, reading, and emotional disabilities. From a survey of 358 school-based speech-language pathologists, Blood and Seider (1981) discovered that 68% of 1,060 children who stutter had at least one concomitant disorder. The concomitant disorders reported most often by the clinicians in the Blood and Seider study were articulation disorders (16%), language disorders (10%), learning disabilities (7%), and reading disabilities (6%).

From a theoretical perspective, the presence of concomitant phonological and/or language disorders in children who stutter may be accounted for by the Demands and Capacity Model of stuttering. As hypothesized by Starkweather (1987), the Demands and Capacity Model suggests that when speech demands exceed a child's motor, linguistic, and emotional capacities, there is an increased likelihood that stuttering will occur. More specifically, disfluencies are predictable when environmental speech demands associated with expressing complex thoughts do not match a child's phonological, syntactic, semantic, and pragmatic abilities. The model shows how reduced speech and language processing capacities, in the form of a concomitant phonological and/or language disorder, may reduce the

ABSTRACT: **Purpose:** The purposes of this survey study were to (a) determine the number of children who stutter with verified concomitant phonological and language disorders, (b) determine the number of children who stutter with suspected concomitant phonological and language disorders, and (c) determine the type of treatment clinicians use with these children.
Method: A systematic sampling plan was used to obtain survey responses from 241 American Speech-Language-Hearing Association (ASHA)-certified, school-based speech-language pathologists from 10 states that were considered to have similar state verification criteria for fluency, articulation/phonology, and language disorders. Respondents were asked to provide information concerning verified and suspected concomitant disorders in children who stutter. They also were asked to select one of four types of intervention approaches suggested by Bernstein Ratner (1995) in treating concomitant disorders in stuttering (i.e., blended, cyclic, sequential, and concurrent).
Results: The speech-language pathologists reported on 467 children who stuttered. Of that total, 262 (56%) children had a fluency disorder *only* and 205 (44%) had a verified concomitant phonological and/or language disorder. A subgroup of children with verified fluency-only disorders were *suspected* of having a concomitant disorder. When treating a fluency and a concomitant phonological and/or language disorder, the majority of clinicians used a blended approach.
Clinical Implications: Using similar state verification guidelines, this survey showed that a large percentage of preschool through high school students possessed a verified fluency disorder and a phonological and/or language disorder. Thus, clinicians need to be aware of the strong possibility that school-age children who stutter might have a phonological disorder and/or a language disorder. Additionally, because the majority of respondents used a blended treatment approach when treating children with a fluency and a verified concomitant phonological and/or language disorder, it appears that many school-based clinicians believe it is best to address both problems simultaneously.

KEY WORDS: survey, children, stuttering, concomitant disorders, treatment, eligibility criteria, verification guidelines

child's chances of managing stuttering when speech demands become complex.

From a clinical perspective, determining the frequency of concomitant disorders in children who stutter is important because there might be a subgroup of children who require a different type of assessment and treatment procedures than those who only stutter (Wolk, Edwards, & Conture, 1993). Unfortunately, the expected number of children with a concomitant disorder is somewhat unclear and seems to vary considerably among studies (Nippold, 1990).

This point can be illustrated by looking closely at the data from five non-survey studies of children who stutter who also had an articulation/phonological disorder.[1] A study by Williams and Silverman (1968) showed that 24% of 115 elementary school-aged children who stuttered also had a phonological disorder. After analyzing data obtained from 54 disfluent children between 3 and 11 years of age, Riley and Riley (1979) found that approximately 33% of the children had moderate to severe phonological problems. Daly (1981), using Van Riper's track II development of stuttering classification criteria, evaluated 138 children and found that 58% of them had a phonological disorder in addition to their stuttering. Using a national database, St. Louis and Hinzman (1988) and St. Louis, Murray, and Ashworth (1991) randomly selected 24 children who stuttered moderately or severely. Of these 24 children, 96% of the children with severe stuttering had a mild to severe phonological disorder. By contrast, only 67% of the children had disordered phonology when the child stuttered moderately.

This large disparity in the reported number of children who stutter and have a concomitant phonological problem could be explained by a variety of methodological differences among studies (Nippold, 1990). One such methodological difference relates to the children's age range from which data have been collected. For instance, Blood and Sieder's (1981) data included reports on children "14 years-of-age or younger," with the "younger" age level not specified. In contrast, Riley and Riley's (1979) study included children between 3 and 11 years of age, and the data from the St. Louis and Hinzman (1988) study came from children between the ages of 6 and 20 years. As can be seen, there are considerable age differences in terms of the upper and lower age limits of the children included in these past studies.

Another methodological difference relates to the criteria used to define stuttering and a concomitant disorder. Clearly, the wide variety of criteria used to identify the number of disfluent children who have a concomitant speech and language disorder makes it difficult to compare results among past studies. For example, Blood and Sieder (1981) did not appear to provide their survey respondents with criteria for determining the presence of a concomitant disorder. In comparison, Riley and Riley (1979) and St. Louis and Hinzman (1988) used specific definitions of stuttering and concomitant disorders when selecting children for their studies, although some disorders appeared to have been broadly defined. For example, the children with fluency and phonological disorders in the St. Louis and Hinzman (1988) study had moderate or severe stuttering. The authors stated that "some of these subjects would have been classified by speech-language clinicians primarily as articulation- or language disordered children rather than stutterers" (p. 351).

One way to provide a more consistent and realistic database in determining the number of school-age children who stutter and have a concomitant disorder would be to use selection criteria and definitions of disorders provided by state verification guidelines. Every state in the United States has established guidelines and verification or eligibility criteria for determining whether a school-age child is eligible for services as an individual with speech and language impairment. Most states specify criteria for each subtype of speech and language disorder. Many states' criteria are similar, but none are exactly the same. This being the case, it would be of interest to know the number of concomitant disorders that exist when similar criteria are used across a range of school-age children who stutter, from preschool to high school students. It also was the intent of this study to obtain data on the number of children who were *suspected of having* a concomitant disorder (i.e., one that is thought to exist but does not meet state verification criteria).

Although similar criteria could help establish the presence of a concomitant disorder in children who stutter, a clinician faces an additional challenge of deciding how to treat the concomitant disorder and stuttering once both are identified. Depending on the child, many clinicians might be prompted to treat the concomitant disorder more extensively than the fluency disorder. Bernstein Ratner (1995) raised the concern that too much attention given to a phonological or language disorder could compromise the development of a child's fluency skills. Consequently, clinicians need to be aware of the possibility that treating a phonological or language disorder and not the fluency disorder could actually inhibit the progress of the child's fluency development. In a university clinic study, Conture, Louko, and Edwards (1993) showed that a fluency and phonological disorder could be treated simultaneously. However, little is known about how clinicians in the schools treat children who stutter and exhibit a concomitant speech and/or language disorder.

In an effort to assist clinicians in making clinical decisions, Bernstein Ratner (1995) provided four specific approaches for how phonological and language impairments concomitant with stuttering might be treated. These included (a) a blended approach (treating both disorders simultaneously within the therapy program), (b) a cyclic approach (treating each disorder for specific periods of time during the course of therapy), (c) a sequential approach (treating one disorder then another), and (d) a concurrent approach (addressing both disorders for equal amounts of time within the context of the lowest phonological and

[1] The term "articulation disorder" is used to describe children's speech sound production errors that appear to be motoric in nature. The term "phonological disorder" is used to describe children's speech sound production errors that appear to be rule-governed. In this survey, the term articulation/phonological disorder was used to refer to children who had speech sound production errors due to either or both disorders. Within this article, the term phonological disorder is used to describe any difficulty a child has with speech sound production.

linguistic demands). Bernstein Ratner suggested that the treatment method a clinician chooses would depend on an assessment of the child's needs. Although sound justification was provided for each type of treatment approach, Bernstein Ratner did not provide any data that indicated the treatment(s) used most often by school-based speech clinicians.

In summary, there is a great deal of disparity among past studies regarding the expected number of children who stutter who also have a concomitant disorder, particularly a phonological and/or language disorder. Most of the disparity appears to relate to methodological differences among past studies regarding the age of the children included and the extent to which criteria were used to define a concomitant disorder. Moreover, little is known about how school clinicians treat a child with a concomitant phonological and/or language disorder.

The purposes of this study were threefold.

- Determine the number of school-age children who, according to similar state verification criteria, possessed a fluency disorder as well as a concomitant phonological and/or language disorder.
- Ascertain the number of children who stuttered who also might have a suspected, unverified concomitant disorder.
- Obtain data regarding the treatment formats school-based clinicians selected when treating stuttering and a concomitant disorder, particularly a phonological or language disorder.

METHOD

Survey Plan

This study used a cross-sectional survey design. Rather than using simple random sampling, the selection of participants was limited to a few states, a procedure that was consistent with the study's purposes. Specifically, state verification criteria for speech and language disorders as of 1997 were obtained from state departments of education in all 50 states. After obtaining and reviewing the verification guidelines for each state, it was found that 10 states used similar definitions, criteria, and types of assessments to identify children with speech and language disorders. The 10 states were Alabama, Florida, Idaho, Minnesota, Missouri, Nebraska, Nevada, Oregon, Vermont, and West Virginia.

As seen in Table 1, all 10 states included in this study used similar criteria in that they defined a fluency disorder as an abnormally high frequency and/or duration of repetitions (sound, syllable, and word), sound prolongations, and abnormal hesitations in the forward flow of speech. Eight of the 10 states required that the child's disfluent speech be evaluated in more than one speaking situation. Seven of the 10 states used the presence of secondary coping behaviors as a criterion measure, and 6 of the 10 states indicated that the fluency disorder had to impede a child's social or academic performance.

Criteria for phonological and language disorders also were examined in terms of deficit areas and assessment tools required to establish the presence of these disorders. These two disorders were chosen because they are the two most frequently reported concomitant disorders in children who stutter (Blood & Seider, 1981). The phonological and language disorder criteria for all 10 states are shown in Tables 2 and 3.

For phonological disorders, all 10 states specified that a child must exhibit significant delays in speech sound acquisition. Eight of the 10 states stipulated that the verification had to be based on the child's performance on a standardized articulation test and that a multidisciplinary team had to be involved in the verification of the disorder. Seven of the 10 states specified that the articulation disorder had to significantly reduce a child's speech intelligibility. Half of the states required that a child's articulation ability had to have an adverse effect on the child's academic or social performance.

For a child to be verified as language disordered, all 10 states required that a child score one to two standard deviations below the mean on standardized language tests. Additionally, a child had to exhibit deficits in syntax, semantics, morphology, or pragmatics. Eight of the 10 states stipulated that a multidisciplinary team had to be

Table 1. Summary of verification criteria for fluency disorders across the 10 target states.

	States									
Criteria	*AL*	*FL*	*ID*	*MN*	*MO*	*NE*	*NV*	*OR*	*VT*	*WV*
1. Child displays disfluent speech behaviors	X	X	X	X	X	X	X	X	X	X
2. Observations of disfluencies in more than one speaking situation	X		X	X	X	X		X	X	X
3. Presence of secondary coping behaviors	X	X	X	X		X		X	X	
4. Fluency disorder impedes academic performance			X		X	X	X		X	X

Table 2. Summary of verification criteria for phonological disorders across the 10 target states.

Criteria	States									
	AL	*FL*	*ID*	*MN*	*MO*	*NE*	*NV*	*OR*	*VT*	*WV*
1. Child's articulation is significantly delayed compared to norms for sound acquisition	X	X	X	X	X	X	X	X	X	X
2. At least one standardized test required for verification			X	X	X	X	X	X	X	X
3. Verification through team evaluation		X	X	X	X	X	X	X	X	
4. Articulation errors significantly reduces child's speech intelligibility	X		X	X	X	X	X			X
5. Articulation ability has adverse effect on academic or social performance		X	X				X	X		X

Table 3. Summary of verification criteria for language disorders across the 10 target states.

Criteria	States									
	AL	*FL*	*ID*	*MN*	*MO*	*NE*	*NV*	*OR*	*VT*	*WV*
1. At least one standardized test required for verification	X	X	X	X	X	X	X	X	X	X
2. Scores on formal test must be 1–2 standard deviations below mean	X	X	X	X	X	X	X	X	X	X
3. Child exhibits errors in syntax, semantics, morphology, or pragmatics	X	X	X	X	X	X	X	X	X	X
4. Verification through team evaluation		X	X	X	X	X	X	X	X	
5. Language ability has adverse effect on academic or social performance			X		X	X	X	X		X

involved in verifying the child as impaired in language ability. Six of the 10 states specified that the language disorder must have an adverse effect on a child's academic or social performance.

The criteria for other concomitant disorders such as voice disorders, learning disabilities, reading disabilities, and emotional/behavioral disturbances were not included because of the large disparity in criteria among the 10 states selected. Thus, verification criteria for concomitant disorders for this study were limited to phonological and language disorders.

In order to generate a sample of participants for this study, a list of 100 randomly selected, school-based speech-language pathologists in each of the 10 target states was obtained from the American Speech-Language-Hearing Association (ASHA). From the list of 1,000 names (100 per state), systematic sampling was employed by selecting every other name on the list. This sampling procedure resulted in a total of 500 potential participants (50 per state).

Respondents were sent a copy of the survey and their state's verification criteria for fluency, phonological, and language disorders. Respondents were asked to complete and return the survey within 2 weeks. A respondent's identity was coded and known only to the investigators. All responses from returned surveys were kept confidential.

If respondents did not respond to the first mailing, a follow-up letter and another copy of the survey were sent along with another copy of their state's verification criteria. Again, respondents were to return the survey within 2 weeks of the packet's receipt. This sampling plan was used to increase the number of respondents who completed and returned the survey. This type of survey sampling without replacement, while limiting the raw number of potential respondents, was appropriate for this survey. The sampling procedure used served to decrease response bias that might have occurred if different individuals from the original listing frame had been contacted for a second mailing.

Survey Instrument

The survey instrument was constructed to obtain demographic information about the respondents and to address the three main purposes of this study. Both closed- and open-form question formats were used in the survey. The majority of questions were presented in a closed-form format such that respondents had to select from one of the answers provided. A few open-form questions were included in order to give respondents an opportunity to provide a brief written response to various questions.

A draft of the survey was distributed to five school-based speech-language pathologists in Lincoln, Nebraska for feedback concerning completeness, ambiguity, redundancy, and relevance of the questions. The feedback then was used to design the final survey instrument. None of the five individuals were respondents for the final version of the survey.

The final version of the survey was organized into four sections.[2] The first section was designed to collect factual information regarding the respondents' academic and clinical experience, caseload size, and grade levels of their caseload. Respondents also were asked to check a particular category listed or provide specific data, such as caseload size and number of children who were verified fluency disordered, as well as verified with a concomitant disorder. Additionally, respondents were asked to rate their confidence level (highly confident, moderately confident, somewhat confident, or not confident at all) when treating children who stutter with a verified concomitant phonological or language disorder.

The second section of the survey asked for specific information about children who stutter who also had a phonological and/or language disorder. A chart was supplied so respondents could provide information about the age and stuttering severity of each child. Space was provided for up to 12 children who stuttered. Additionally, respondents were instructed to indicate the presence of a verified phonological and/or language disorder using their state verification/eligibility criteria supplied to them by the investigators.

The third section of the survey focused on children with fluency disorders and suspected concomitant disorders. A suspected concomitant disorder was defined as one that was thought to exist but did not meet state verification criteria. For example, a clinician might suspect or conclude from informal observations that a child who stutters had poor narrative discourse skills, indicating a possible language disorder. However, after standardized language testing and consideration of the state verification criteria, the child would not qualify as language disordered. In this case, the child would be classified as having a suspected language disorder. A chart similar to that found in Section 2 on the survey was provided in this portion of the survey. Respondents indicated the child's age and stuttering severity and placed an "x" by one or more concomitant disorders listed.

The fourth section of the survey addressed ways in which clinicians treat children who stutter who also have a verified concomitant phonological and/or language disorder. Respondents were asked to select one of four types of intervention approaches suggested by Bernstein Ratner (1995) in treating concomitant disorders in stuttering (i.e., blended, cyclic, sequential, and concurrent). These methods were described in the survey as (a) treating stuttering and the verified disorder simultaneously (blended), (b) focusing on the fluency disorder for a "cycle" of time followed by treatment of the phonological and/or language disorder (cyclic), (c) treating the fluency disorder until all goals are met followed by treatment of the phonological and/or language disorder (sequential), and (d) devoting an equal amount of treatment time on the fluency and concomitant disorder but with minimal phonological or linguistic demands (concurrent). Space on the survey was provided for respondents to describe any other forms of treatment they used in treating children who stutter who also had a concomitant phonological and/or language disorder.

[2] A copy of the survey is available on request from the second author.

Data Analysis

A descriptive analysis was used to interpret the data. Means and standard deviation scores were derived for the various data on caseload size and the number of cases reported in Sections 2–4 of the survey. All of the demographic data associated with the number of children with concomitant disorders and the number of respondents who selected each type of treatment intervention for children with concomitant disorders were expressed as percentages.

RESULTS

Demographic Information

The final participant pool included 241 respondents (a 48% return rate), which appears adequate for survey research data (Babbie, 1990) and the systematic sampling procedure that was employed. The highest percentage of respondents came from the state of Nebraska (78%), and the smallest percentage from Florida (26%). Return rates for the eight remaining states were: Alabama (40%), Idaho (54%), Minnesota (44%), Missouri (48%), Nevada (38%), Oregon (56%), Vermont (54%), and West Virginia (48%). Table 4 shows a summary of the demographic information obtained from respondents relative to years of experience, type and date of degree, caseloads, and confidence in treating children who stutter. In addition to the data in Table 4 on caseloads, it was found that the total number of students on the respondents' caseloads ranged from 2 to 135, with a mean of 46 (SD = 25.5). The average number of verified fluency disorder cases per respondent, regardless of possible concomitant disorders, ranged from 1 to 18, with a mean of 2.20 (SD = 7.2).

Verified Fluency and Concomitant Disorders

Respondents were asked to provide the number of children who were verified as fluency disordered with and without a verified phonological and/or language disorder.

Table 4. Summary of major demographic data from Section 1 of the survey.

Years of experience	*Percentage of respondents*
1–5	19
6–10	26
11–15	18
16–20	18
21–25	13
>25	6
Highest academic degree received	
Bachelor's	<1
Master's	96
Doctorate	2
Specialist	<1
Educational specialist	<1
Date degree was received	
1967–1971	4
1972–1976	18
1977–1981	19
1982–1986	23
1987–1991	20
1992–1996	16
Grade level of students on caseload	
Preschool	58
Elementary	81
Middle school/junior high	41
High school	28
Confidence in treating children who stutter	
Highly confident	10
Moderately confident	51
Somewhat confident	37
Not confident at all	1
Confidence in treating children who stutter plus a concomitant disorder	
Highly confident	13
Moderately confident	57
Somewhat confident	28
Not confident at all	2

As shown in Figure 1, a total of 467 children were identified.[3] Of these 467 children, 262 children (56%) were identified as verified fluency disordered only. A total of 205 children (44%) were identified with a verified fluency and a concomitant phonological and/or language disorder. These children ranged in age from 3 to 20 years (M = 9, SD = 3.7). Within this group of 205 children, 66 (32%) presented with a phonological disorder, 72 (35%) presented with a language disorder, and 67 (33%) presented with a phonological *and* language disorder.

[3] Respondents also identified seven children who had a verified fluency disorder and a concomitant disorder other than phonology and/or language. These seven students were not considered in the total sample.

Verified Fluency Disorders With Suspected Concomitant Disorders

In the third section of the survey, respondents were asked to provide information concerning the age and severity of students who were verified as having a fluency disorder and were suspected of having a concomitant speech or language disorder, but did not meet their state's verification criteria. A list of concomitant disorders was provided on the survey. For any disorder not listed on the survey, respondents were asked to record the specific disorder in the space provided.

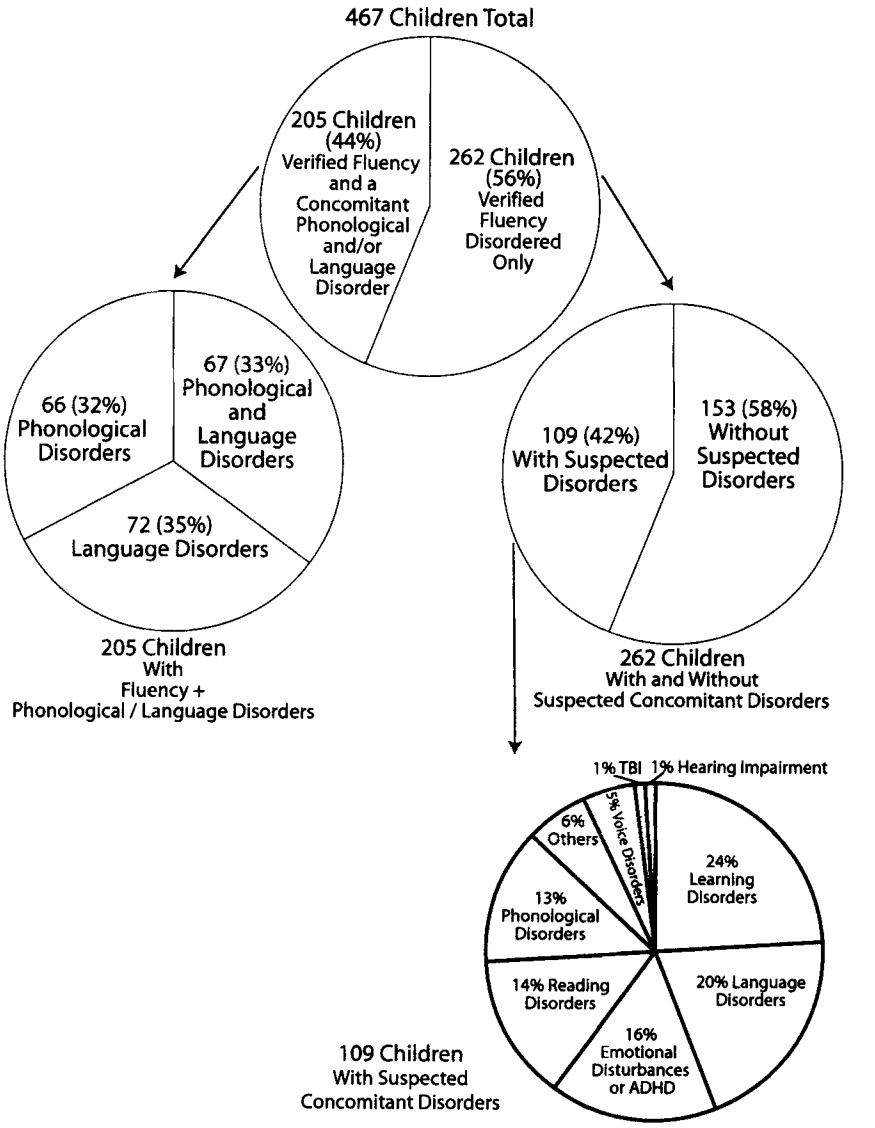
Of the 262 children with a verified fluency disorder only, 109 (42%) children had a suspected concomitant disorder and 153 (58%) did not have a suspected concomitant disorder (see Figure 1). Included in the sample of 109 children suspected of having a concomitant disorder, 20% had a suspected language disorder, 13% had a suspected phonological disorder, and 5% had a suspected voice disorder. A total of 24% of the children were suspected of having a learning disability, and 14% were suspected of having a reading disability. A total of 16% had a suspected emotional disturbance/attention disorder (emotional disorder = 12%; attention deficit disorder (ADD) = 0.6%; attention deficit hyperactivity disorder (ADHD) = 3%), 1% were suspected of having a hearing impairment, and approximately 1% were thought to exhibit symptoms consistent with traumatic brain injury (TBI). The remaining 6% of cases included a variety of problems that respondents placed in an "other" category. These included suspected sensory integration impairment, social delay, mental retardation, auditory processing difficulties, and Prader Willi Syndrome.

Treatment of Fluency and a Concomitant Phonological Disorder

In the last section of the survey, the respondents provided information about how they treated a child who stuttered who also had a verified concomitant phonological disorder. The percentages of clinicians using each type of treatment are shown in Figure 2. The distributions showed that 45% of the respondents used a blended approach (i.e., treating fluency and the concomitant disorder simultaneously). A concurrent approach, which focuses on equal amounts of treatment for fluency and phonological disorders but without direct attention to the sound errors, was selected by 21% of the respondents. A small percentage of clinicians (14%) used a "cycles" approach (i.e., treating the fluency disorder for a short period of time followed by treatment of the phonological disorder). Only 4% of the clinicians focused on a sequential approach, in which the treatment of the fluency disorder continued until all goals were met followed by treatment of the phonological disorder.

A total of 17% of the respondents reported using some other therapy strategy than the four approaches described on the survey. Other types of treatment approaches included (a) focusing on the more pronounced disorder, (b) incorporating family counseling into the treatment program, (c)

Figure 1. Percentage of children who stutter with verified fluency disorders and verified phonological, language, or phonological and/or language disorders, as well as children with and without suspected concomitant disorders.



increasing the amount of time focused on fluency treatment as the child matured, and (d) combining treatment for fluency and phonological therapy in natural and structured speech contexts.

Treatment of Fluency and a Concomitant Language Disorder

The same set of options for treating a phonological disorder was provided for treating a verified language disorder. The data associated with each type of treatment are displayed in Figure 3. A total of 55% of the clinicians reported using a blended approach; a cycles approach was selected by 14% of the respondents. Approximately 10% of the clinicians used concurrent intervention, and only 1% of the clinicians chose a sequential intervention strategy. Finally, 23% of the respondents indicated that they used alternative approaches to treatment. These included (a) attending to the more pronounced disorder, (b) counseling the family, (c) increasing the amount of time devoted to fluency treatment as the child matures, and (d) implementing language intervention exclusively.

DISCUSSION

The following paragraphs present the major findings relative to past research, as well as any theoretical and

Figure 2. Percentage of clinicians who use a particular treatment approach with children who stutter who also have a phonological disorder.

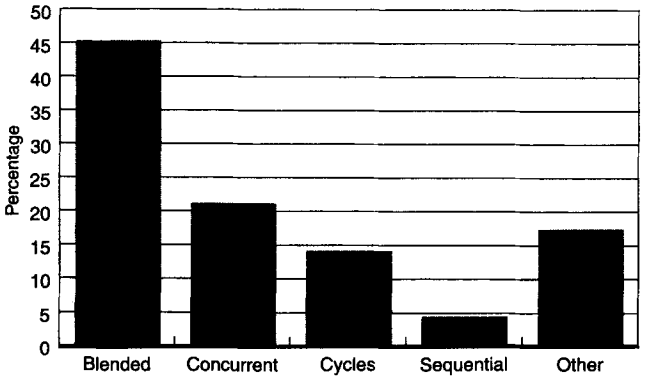
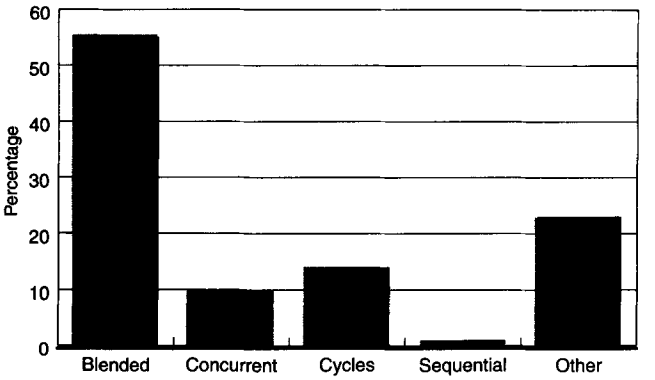


Figure 3. Percentage of clinicians who use a particular treatment approach with children who stutter who also have a language disorder.



clinical implications the data have for the field of stuttering. The results are presented in accord with the four major sections of the survey.

Demographic Information

The data collected in this survey came from a variety of regions within the United States. The high percentage of respondents with master's degrees is not surprising given that participants were obtained from the ASHA membership list. This organization requires that a person have a master's degree to be a member. Of greater interest was the wide range of experience reported by respondents. More than 80% of the participants had 9 or more years of experience, indicating that the clinicians had considerable professional experience. This also shows that the majority of respondents received their training prior to 1992, when ASHA eliminated required clinical practicum in the area of fluency disorders. It is unclear whether the same results would be obtained if the respondents had not had the required training. Moreover, respondents had an average of two children who stutter on their caseloads, indicating that a small percentage of school-based clinician's caseloads involves students who stutter.

Despite the small number of children with fluency disorders on clinicians' caseloads, 61% of the respondents were either highly or moderately confident in treating children who stutter. This finding is consistent with the results of a study by Brisk, Healey, and Hux (1997), who also found that a majority of clinicians were confident in treating school-age children who stutter. The present study extends the Brisk et al. findings in that clinicians also appear confident in managing both fluency and a concomitant disorder. The fact that almost all of the respondents had a master's degree and several years of experience could explain why the respondents felt confident in treating stuttering and any concomitant disorder. Additionally, these factors might explain why this group of potential respondents chose to return the survey.

Verified Fluency and Concomitant Disorders

The findings of this survey revealed that 44% of the children who stutter had a verified concomitant phonological and/or language disorder compared to 56% of the children who had a verified fluency disorder only. The percentage of children who stuttered and had a phonological and/or language disorder is large and could be due to the wide variety of measures and the variations in state eligibility criteria used to identify children with these disorders. It also could be due to the wide age range of children included in this study. By comparison, Tomblin et al. (1997) found that 7.4% of kindergarten children ages 5 to 6 years had specific language disorders when they were tested directly using a standardized set of language measures. Thus, the calculation of prevalence statistics for language disorders is much smaller when consistent, specific language measures are used with a limited age group of children.

The number of children with verified concomitant disorders in this study is markedly less than the 68% of disfluent children with concomitant disorders reported by Blood and Seider (1981). The differences in the percentages of concomitant disorders may be attributed to three factors.

1. Respondents in the Blood and Seider study did not appear to receive any guidelines for defining a concomitant speech and language disorder for children on their caseload. Thus, their respondents were free to use their own criteria or definitions in identifying a child with a concomitant disorder. In the present study, specific state verification guidelines were used as a benchmark to identify the presence of both the fluency disorder and a phonological and/or language disorder. Had these criteria not been used, the number of children with a fluency disorder and a phonological and/or language disorder may have been higher, considering the number of

respondents suspected of having a concomitant disorder.

2. The concomitant disorder data from this study only included verified phonological and/or language disorders rather than every possible speech, language, hearing, emotional, or attentional disorder that might have been identified.
3. Differences in findings could be related to disparities in the age groups used in each study. The children in Blood and Seider's study had an upper age limit of 14 years and a lower age limit that was unspecified. Data from the present study included a much larger age range (i.e., 3 to 20 years of age).

The findings from this study relate to past reports of phonological disorders accompanying fluency disorders. In this study, 32% (66/205) of the children with verified fluency disorders also demonstrated a verified concomitant phonological disorder. This is within the range of 30–40% of children who stutter who also exhibit a phonological disorder (as reported by Conture et al. [1993]). However, one could argue that the 32% of the children who stutter with phonological disorders found in the present study is too high because of how the percentage was calculated, or that articulation disorders were combined with language-based phonological problems. If the 66 children with verified phonological disorders in the present study is computed from the total 467 children rather than the subset of 205 children, the percentage of children with a fluency disorder and a phonological disorder decreases to 14%. Perhaps this is a more realistic figure given the similarity of the criteria used to establish a phonological disorder in this study. If so, then the percentage of children who stutter with phonological disorders is quite different from the Conture et al. review of findings in this area. As stated earlier, it seems that the differences in percentages could be related to differences in the criteria and definitions used to determine that a child who stutters also has a phonological disorder.

The association of a phonological disorder with stuttering has increased importance given recent findings by Paden, Yairi, and Ambrose (1999), which show that preschool children in the early stages of stuttering do not seem to recover from the disorder if they have phonological deficits (as determined by a standardized phonological assessment instrument). The presence of poor phonological abilities, as opposed to articulation problems, could be a predictive factor that a child will not recover from stuttering.

The impact of language deficits on the persistence of stuttering in young children is less clear, given the longitudinal data reported by Watkins, Yairi, and Ambrose (1999). These researchers discovered that language skills (defined by syntactic and morphological criteria) of very young children who stutter might be advanced rather than delayed or disordered. The data from the present study suggested that approximately 1/3 of the 205 school-age children with a fluency disorder also had a verified language disorder. Conceivably, this percentage might be reduced considerably to 15% if the percentage calculation is based on the total group of 467 children rather than on the subgroup of 205 children. Nonetheless, some preschool children might be vulnerable to developing poor expressive language if the stuttering persists into the elementary school-age years. Problems or difficulties in expressive language abilities might be a by-product of stuttering for several years. For example, Weiss and Zebrowski (1994) hypothesized that school-age children who stutter might purposely shorten a story in an attempt to convey information as fluently as possible.

The results of this study support the Demands and Capacities Model (Starkweather, 1987) in that a substantial percentage of children who stutter also have phonological and language disorders. These subgroups of children who stutter could have reduced capacities for fluency when communication demands become too great. Some children who stutter may have limited phonological and language skills (Adams, 1990) or may develop different linguistic or discourse strategies to compensate for their fluency disorder when communication demands increase. The relatively large percentage of children with verified fluency and phonology and/or language disorders found in this study support this notion.

Verified Fluency Disorders With Suspected Concomitant Disorders

The use of specific state-mandated criteria for establishing the presence of a speech or language disorder may pose problems. When states rely on standardized tests to diagnose speech and language disorders, some students' language disorders may not be verified. A recent study by Scott, Healey, and Norris (1995) supports the notion that subtle language deficits may exist even though the child who stutters is not identified as "language disordered" according to state guidelines. In their study, 33% of the children who stuttered produced more nonfluencies, linguistic repairs, and discourse errors during story retelling and story generation tasks than the other subgroup of children who stuttered. Interestingly, these linguistic deficits were not detected using formal language assessments—even though these deficits indirectly affected the quality of stories children told.

Treatment of Fluency and Concomitant Disorders

The present study found that the majority of clinicians treating a fluency disorder and a concomitant phonological and/or language disorder used a blended approach in which both disorders were addressed simultaneously in the treatment program. Given the findings of Conture et al. (1993) regarding the benefits of a blended approach, these results from the present study are encouraging. Because the majority of respondents to the survey use a blended treatment approach for verified concomitant phonological and language disorders, it suggests that many clinicians see the merit in addressing both problems simultaneously.

Clearly, there are other approaches to treating a disfluent child's concomitant disorder. In light of Bernstein Ratner's (1995) suggestions, the second most popular treatment of

our survey respondents was a concurrent approach. In this approach, Bernstein Ratner recommended that fluency training be placed within linguistic and phonological contexts that the child can manage. For example, when treating a phonological disorder, a clinician would focus on treating the fluency disorder while the clinician models the correct sound production without direct reference to the child's sound production during each session. In this approach, both problems are addressed, but only the fluency disorder is treated directly.

Only a few school-based clinicians used a cycles approach, and even fewer applied a sequential approach in which treatment continued with one disorder until all goals were met. As Bernstein Ratner (1995) suggested, a clinician's choice of treatment depends on a careful analysis of the child's needs and may require changes in programming if progress is impeded through one particular approach.

In this study, clinicians were not asked if they modified their treatment to accommodate a suspected concomitant disorder. It may be that clinicians used a similar approach to treating a fluency and suspected speech or language disorder. In the future, it may be worthwhile to ask clinicians about the treatment approach they use with students with verified fluency disorders and suspected speech/language disorders.

Caveats

It is important to point out some potential limitations concerning survey research. One potential shortcoming of this survey study is that only approximately half of the clinicians contacted by mail returned the survey. Although this return rate appears to be acceptable (Babbie, 1990), it is difficult to know how the findings of this study might have changed had more clinicians responded or had a more random sampling procedure been used. It also is difficult to know whether respondents accurately interpreted and followed the verification criteria provided. Given these possibilities, clinicians might want to be cautious in generalizing these results to children on their caseloads.

Finally, it is possible that some clinicians did not understand the nature or the wording of the questions and answers related to the type of treatment used for treating concomitant phonological and language disorders in children who stutter. The descriptions of the approaches listed on the survey may not have matched the methods some respondents used; therefore, there could have been some confusion as to which approach to select.

Even with the shortcomings of this research methodology, it is believed that this study offers important information to school-based clinicians serving children who stutter and to researchers interested in the characteristics of subgroups within the school-age population of children who stutter. An attempt was made to use similar state criteria for identifying children who stutter who also have concomitant disorders. This also is the first study to provide data on the forms of treatment, suggested by Bernstein Ratner (1995), for managing phonological and language disorders in children who stutter.

CONCLUSION

Two of the primary aims of the present study were to provide additional insights into the percentage of children who stutter who also exhibit verified and suspected concomitant phonological and language disorders. Although several studies in the past have examined the issue of concomitant disorders in children who stutter, few have used a consistent set of criteria to define both a fluency disorder and two common concomitant disorders. Using similar state verification guidelines, this survey showed that 44% of 467 students (preschool through high school-age) possessed a verified fluency disorder and a phonological and/or language disorder. Thus, clinicians need to be aware of the strong possibility that school-age children who stutter might have a phonological and/or language disorder.

The third aim of this study was to determine the types of treatment clinicians typically use when treating a child who stutters who also has a phonological and/or language disorder. Evidence was provided for all four approaches mentioned by Bernstein Ratner (1995). However, the next step is to determine the effectiveness of these various approaches when treating children with fluency and concomitant disorders in the school setting. This information will increase our knowledge base of effective treatments for children with stuttering and concomitant disorders. Additional research questions to be addressed include the following:

- What type of treatment is used when treating children who stutter who have a suspected concomitant disorder?
- How does a clinician decide which treatment approach to use with children who stutter who have a verified or suspected concomitant disorder?
- What type of treatment is the most effective when treating children who stutter who have a concomitant disorder?

These and other questions regarding concomitant disorders in children who stutter are important issues for future research.

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