

THE DIFFERENTIAL DIAGNOSIS OF DISFLUENCY

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Speech disfluency can be a symptom of many different disorders. It may also be the typical performance of a normally developing child. This paper identifies and defines five explanations for fluency failure. One type, developmental disfluency is a normal process, while the remaining four: stuttering, neurogenic, psychogenic, and language delay disfluencies can be the result of a variety of disorders. The point is emphasized that to naively identify all disfluencies as stuttering might lead to the selection of misguided, inefficient and ineffective approaches to remediation.

Normally fluent speech is not perfect speech. Normal speakers may pause, edit, and revise their thoughts without being referred to a speech-language pathologist. Disfluencies are a part of normal speech. However, when speakers cross the boundary from normal nonfluencies to abnormal disfluencies, they are exposed to the negative evaluations of their listeners. Each of us carries within us a model of exactly what is acceptable and unacceptable in terms of fluent and nonfluent speech. However, even though the idea of fluency is easily understood, it resists a straight-forward and unambiguous definition (Finn & Ingham, 1989). Often, there are no hard and fast guidelines we may use other than our own judgment. A Justice of the United States Supreme Court once stated that he couldn't define pornography, but he knew it when he saw it. Similarly, we may not be able to define normal speech in terms of its inherent disfluencies but we know whether or not speech meets our standards of expected fluency. As speech-language pathologists responsible for judging the adequacy of communication, the identification of disfluencies in the speech of our clients is not a terribly difficult task. Unfortunately, our work does not end with a simple identification. It is the accurate differentiation of the source of disfluencies that may determine whether or not our treatment approaches will be successful.

The purpose of this article is to explain, compare, and contrast the different types of disfluencies that disrupt normally fluent speech and explain how differential diagnosis of disfluency can effect treatment strategy.

NOT ALL DISFLUENCY IS STUTTERING

There are at least five major explanations for fluency failure. As indicated in Table 1, one type of disfluent speech is the result of a normal developmental process and the remaining four are the result of different abnormalities. A child may be disfluent as a result of passing through the necessary, but stressful, stages of language learning. These *developmental disfluencies* are a normal part of the acqui-

TABLE 1. Types of fluency failures.

	<i>Normal Disfluencies</i>
Developmental	
Stuttering	
Neurogenic Dysfunction	
a. motor speech disfluencies	
b. neurolinguistic disfluencies	
c. chemical reaction disfluencies	
Psychogenic	
a. emotionally based disfluency	
b. manipulative disfluency	
c. malingering	
Language Delay	

sition of our language. A person may be disfluent because he is a *stutterer*. A speaker may produce disfluent speech as a result of a *neurogenic dysfunction* which may affect communication. There are disfluencies that are *psychogenic disfluencies* and there are disfluencies that are the result of *language delay*. Each type of disfluency presents its own identifiable set of conditions that the speech-language pathologist must recognize and understand prior to developing a treatment plan.

Normal Developmental Disfluencies

As children pass through the developmental stages of language learning, they will be more disfluent at certain times than others. These developmental periods of disfluency are a normal occurrence. In mastering our spoken language, we become more fluent as we become more proficient. Normally communicating children hit a peak of disfluency usually between the ages of 2 1/2 to 4 years of age. These normal disfluencies are characterized by the repetition of whole words and phrases with occasional interjections of "uhs", "ers", and "ahs" (Perkins, 1971; Yairi & Lewis, 1984). This is a transitional stage most children leave behind as they master oral communication.

There is no need for therapeutic intervention for these children. The task for the speech-language pathologist is to differentiate normally disfluent children from those evidencing other disfluency patterns, especially stuttering. Children who go beyond simple repetitions and interjections to forced prolongations of sounds (Yairi & Lewis, 1984) with signs of physical struggle in producing speech (Ryan, 1974) may be "incipient stutterers." They begin to repeat parts of words rather than whole words and the frequency and duration of these disfluent episodes rise past normal expectations. Pindzola and White (1986) suggest that if more than 5% of a child's speech is characterized by repetitions of sounds or words and more than 1% is abnormally prolonged the child has left the boundaries of normal developmental disfluency. Normally fluent speech is not effortful for the speaker and the rhythm and rate should not call attention to themselves. Signs of unusual struggle or concern about the process of talking are also negative signs. A systematic examination of the communication patterns of children suspected of passing beyond the limits of normal disfluency will determine the possible type of disfluency they are exhibiting.

Stuttering

Stuttering is the most common classification of disfluency. There are definite signs a speaker must evidence and experiences that must be a part of a case history before the label *stuttering* is used. Stuttering is a disorder of childhood and follows a predictable developmental path (Bloodstein, 1960). Parents of stutterers report that, initially, their children are disfluent in a highly episodic pattern. Days, weeks, or months may pass between episodes of disfluent speech. Eventually these periods of fluency become more brief, and the disfluency becomes chronic in nature. Most parents are also at a loss to explain any specific conditions that might account for the initiation of the disfluent behavior.

Speech characteristics also follow a developmental track. Bloodstein (1960) reports that the relatively simple whole word and sound repetitions that dominate early stuttering give way to more complicated patterns as the disorder evolves. Disfluencies themselves shift from function words such as prepositions, pronouns, and conjunctions to content words like verbs and nouns. The covert, internal reactions of the speaker also go through an evolutionary process from little overt reaction to disfluency, through self-identification as a stutterer to the eventual strong emotional reactions, fear and embarrassment of the untreated, fully developed stutterer. This gradually evolving pattern, pointed out by numerous authors, emphasizes the developmental nature of the speech phenomenon we label *stuttering*. The absence of a developmental history beginning in childhood should alert the diagnostician to the possibility that the disfluent speech being observed might not be stuttering.

In addition to a sequenced development, stuttering behaviors vary in significant ways from the disfluent speech resulting from other etiologies. Van Riper (1982)

and Stromsta (1965) report that even the repetitions of stutterers are different than those of other disfluent speakers. When stutterers repeat they tend to insert the neutral schwa vowel /ə/ in place of the vowel that would ordinarily occur in a word. Thus, [bae-baesbaul] becomes [bə-bə-baesbaul]. Stuttering is also often characterized by behavior patterns that have little to do with speaking. These "secondary characteristics," such as jaw tremors, eye postures, head movements, or total bodily gyrations, disappear during fluent communication production.

During the diagnostic session, the disfluency pattern that characterizes stuttering may be changed in several ways. This should also help the clinician differentiate a stuttering pattern from other types of disfluency. For example, reduction in stuttering symptoms usually occur with repeated readings of the same passage. This phenomenon, identified as the *adaptation effect* was first mentioned in 1937 (Johnson & Knott, 1937). Although stuttering might decrease as much as 50% during the first five readings of a passage (Bloodstein 1981), there is no transfer of this reduction of stuttering to other oral readings or to spontaneous speech. However, such a phenomenon can be used to aid in the differential diagnosis of stuttering from other disfluency types. In fact another unique event, the temporary distractibility of stutterers, is one of the major ways of identifying this type of disfluency. "White noise" or other masking sounds presented at high intensity (Cherry, Sayers, & Maryland, 1955; Shane, 1955), speaking in time to a metronome (Barber, 1940), singing, group recitation, finger tapping, or arm swinging can all alter or eliminate stuttering for brief periods. Thus an important fact to consider during diagnosis is how manipulable the disfluent symptoms are under varying conditions similar to those just identified.

On a more internal or covert level stutterers often have internalized a belief system about communication that varies from the perceptions of other speakers. Even as children, they often identify themselves as victims of some mysterious force that makes speaking a difficult task. Normal speech is a mystery to them, and as they grow, they develop life styles designed to avoid specific, preidentified speaking situations in which disfluency is expected. However, although stutterers evidence specific fear or anxiety reactions toward speech, their personalities are not markedly different from others. They do not comprise an identifiable subgroup and represent a wide variety of personality types and essentially the whole range of emotional adjustment (Bloodstein, 1981).

In summary, many of the following characteristics are necessary for a speaker to be labeled a stutterer:

1. The behavior must have a developmental history beginning in childhood;
2. There are no etiological or maintaining factors identifiable;
3. The repetition patterns differ from those of normal speakers;
4. The symptoms can be modified by any number of clinical manipulations;

5. Allied or "secondary characteristics" are not evidenced during fluent periods;

6. The speaker has internalized a belief system concerning communication that acknowledges stuttering and recognizes the difficulty of specific communication situations.

If a given client does not present a case history consistent with the outline presented above or seems at odds with the discussion presented thus far, the speech-language pathologist should be alert to the idea that the speaker might be disfluent for reasons other than stuttering.

Neurogenic Disfluency

Neurogenic disfluency is the result of an identifiable neuropathology in a speaker with no history of fluency problems prior to the occurrence of the pathology (Culatta & Leeper, 1987). Often speech disfluencies appear at onset, or soon after, neurologic trauma or progressive disease. In addition, specific medications have been reported to affect the fluency aspect of communication independent of content (Helm-Estabrooks, 1987). It is critical to identify these speech breakdowns as the result of a specific systemic dysfunction as compared to the unknown cause of stuttering. Calling these speech patterns "neurogenic stuttering" can be misleading and is inaccurate. It is misleading because it implies that the treatment might somehow parallel the treatment provided stutterers. It is inaccurate because it is confusing a neurologically based communication disorder with one of unknown origin (Culatta & Leeper, 1987). Kent (1983) suggests that the term *stuttering* in the case of developmental disfluency is a diagnostic label whereas disfluency following neurologic damage is only one symptom of a more pervasive problem.

Neurogenic disfluencies are often different in form from those presented by stutterers. Rosenbek (1984), when describing the repetition of incorrect sounds and words produced by aphasics or apraxic speakers, notes that these repetitions cease once the phonemically correct target, or a close approximation, is achieved. By comparison, the stutterer repeats sounds that are correctly articulated except for their increased frequency of occurrence. The speech-language pathologist should be alert to the possibility of speech disfluencies resulting from three neurogenic bases: motor speech disorders, neurolinguistic disorders, and chemical reactions.

Motor Speech Disfluencies

The different dysarthrias that can result from lesions in the neuromotor speech system often include disfluencies that might on the surface appear to be identical with those of stutterers. These behaviors, however, are usually accompanied by other communication deficits (i.e., imprecise articulation, dysphonias and dysprosody, disorders) which occur as infrequently in stutterers as they do in the general

population (Leeper & Culatta, 1989). Children with known deficits such as cerebral palsy present a special challenge because it is often difficult to determine if their disfluencies are solely attributable to the motor speech mechanism damage. Because it is possible that the neurological damage that was present prior to birth precluded the possibility of developing normally fluent speech, it becomes the task of the speech-language pathologist to determine whether the disfluencies are the result of congenital, environmental, or a combination of factors initiating or maintaining disfluency (Culatta & Leeper, 1987).

Neurolinguistic Disfluencies

The aphasic patient who experiences dysnomia or dementia may display highly disfluent speech while searching for words. Interjections, unusual pauses, and circumlocutions are all probable. However these behaviors will cease once the target word is located. These speech manipulations by the neurolinguistically impaired speaker serve the function of maintaining speech flow while searching for an elusive word. When the stutterer employs similar tactics, they serve to delay the moment of articulation of an already identified, feared word. The treatment implications for these separate disorders is obvious and confusion between these types of disfluency can only lead to frustration for the patients involved due to minimal therapeutic results.

Chemical Reaction Disfluencies

Helm-Estabrooks (1987) reports that drugs which affect the basal ganglia may affect speech fluency. She reports three studies that tend to link disfluent behavior with concurrently administered medications in clients with no previous history of disfluent speech. Quader (1977) describes two cases in which amitriptyline, a tricyclic antidepressant, resulted in "stuttered speech." In both cases, when the drug was discontinued speech resumed its normal fluency. A 4-year-old child reported by McCarthy (1981) developed severe disfluencies upon the administration of theophylline, a broncho-dilator used to treat asthma. In a study reported by Nurnberg and Greenwald (1981), different dosages of phenothiazine with psychotic patients drastically affected fluent speech production. Although most label warnings do not include information about the effects that medications have on fluency, it would serve the speech clinician well to inquire concerning any recent introduction of medication in patients' treatment plans especially if the disfluency reported is of sudden occurrence.

Neurogenically based disfluencies of all three types mentioned above can usually be distinguished by the alert clinician. The onset of neurogenic disfluency is usually abrupt. The adult patient does not have a history of fluency failure. Initially the speaker will feel little concern about speech disruptions (Canter, 1971) as compared to the developmental stutterer who exhibits undue concern.

Many of the behavioral manipulations that are effective in changing stuttering behavior will have little or no effect upon the neurologically disfluent client. Although these guidelines should serve to sensitize the interested reader, they are by no means absolute. A gradual onset of neurogenic disfluency is a possibility when further damage occurs after the original trauma. Helm et al. (1980) describe cases of patients who developed speech disfluencies concurrent to developing seizure disorders following closed head injuries and tumors. Rosenbek (1984) reports negative emotional response to disfluencies in patients with chronic motor dysfunction. As with stutterers, it is also possible to alter some of the disfluent symptoms of a neurologically impaired patient by employing rhythmic intonation or slow speech rates. However, a comparison of the profiles of the developmental stutterer and the neurogenically disfluent patient should provide the speech clinician with enough information to distinguish between the two and avoid the confusion that can lead to unsuccessful therapeutic intervention strategies.

Psychogenic Disfluency

Psychogenic disfluencies may be grouped into three categories. However, emotionally based disfluencies far outnumber manipulative disfluencies and malingering as a documented phenomena.

Emotionally Based Disfluencies

An identifiable personal crisis and sudden onset of symptoms in otherwise fluent speakers are the most striking characteristics of this type of disfluency. Deal (1982) suggests eight comparison points that will help differentiate emotionally based disfluencies from other classes of fluency failure.

1. The onset is sudden.
2. The onset is temporally related to a significant event . . . which seems to reflect extreme psychological pressures.
3. The pattern is primarily repetition of initial or stressed syllables.
4. The pattern is affected little by choral reading, white noise . . . singing and different communicative situations.
5. (There are) . . . no islands of fluency; even automatic, over-learned social responses are (disfluent).
6. (The patient) does not express any interest in . . . stuttering.
7. (The patient) . . . does not exhibit secondary symptoms . . . does not avoid words, sounds or speaking situations . . . no attempt to inhibit . . .
8. (The patient) evidences the same pattern of repetitions during mimed reading aloud which is not characteristic with developmental stuttering or associated with disfluency secondary to brain damage. (p. 304)

Once again, even though the presenting symptoms may superficially resemble stuttering, speakers displaying the above signs should not be labeled as stutterers. In addition, speakers in this disfluency class have not suffered demonstrable neurological insults that might be causative of the disfluent speech pattern.

It is not unusual for the frequency of the repetitions in this disfluency class to far exceed the frequency of disfluencies of stutterers. Emotionally based disfluencies nearing 90% of all utterances are not unusual (Culatta & Leeper, 1987). The nature and degree of the traumatizing event responsible for the disfluency is unique to each client. Deal (1982) reports a patient who suddenly began to be disfluent after each of two, separate suicide attempts. Dempsey and Granich (1978) describe the sudden onset of disfluent speech after a patient's ship received a direct hit during a war time experience. The author was called to consult with a high-school quarterback who spontaneously became disfluent when faced with the possibility of starting in an important game when the four players ahead of him on the team depth-chart were injured or ineligible to play. As in neurogenic disfluency, the high frequency disfluency patterns exhibited by the emotionally traumatized patient are not usually as manipulable as those of stutterers.

Although treatment for these clients is usually best provided by counselors, psychologists, psychiatrists, social workers, or other appropriately trained professionals, it is often the speech-language pathologist that is first contacted due to the inappropriately labeled *stuttering problem*. A proper identification of the disfluency type and an explanation of its departure from stuttering can be of great value in the provision of appropriate treatment.

Manipulative Disfluency

Disfluent speech indulged in by speakers, usually identified as children, to either consciously or unconsciously control the environment has been described in detail, but rarely identified in other than theoretical papers (Shames & Sherrick, 1963; Van Riper, 1982). Van Riper reports that "one can sense the controlling, punishing, wheedling, exploitive urges behind the behavior. . . . These (disfluent speakers) . . . suffer less than their listeners."

Differentiating symptom patterns may include inflection and intonation patterns that are demanding and insistent, the lengthy repetition of fluent words and a variety of secondary characteristics that are not modified over time. These speakers are rarely emotional about their disfluency patterns and develop few avoidance behaviors or speaking fears. (Van Riper, 1982).

Documented cases of manipulative disfluency as well as malingering are not easily found. However, the logic of the arguments for manipulative disfluency certainly must sensitize the clinician to its possibility.

Malingering

Purposeful disfluency indulged in to avoid responsibilities or assignments is a conceivable, but undocumented,

possibility. A reliable test of many other types of behavioral malingering, sodium amytal hypnosis, will not distinguish between voluntary and involuntary disfluency because it has been demonstrated to affect speech in cases of developmental stuttering as well as neurogenic disfluency. Nevertheless, evidence to support the existence of disfluency as malingering might be found with careful examination. If the diagnostician could document atypical disfluency characteristics such as repetitions occurring consistently at the end of utterances, extremely high disfluency rates, and unusual responses to diagnostic manipulations of disfluency, this evidence could be used to argue the presence of malingering (Leeper & Culatta, 1989).

This section has presented information supporting the concept that disfluency characterized by sudden onset and the coexistence of a specific traumatizing event or series of events should be diagnosed differently from the disfluent patterns of normal development, stuttering or neurogenic disfluency. Arguments were also presented that would establish the possibility of manipulative disfluency and malingering as possible disfluency classes. Workers such as psychologists and social workers should be helpful to the speech-language pathologist in diagnosing the presence of this type of etiology. The final disfluency class to be highlighted is the disfluency that results from language delay.

Language Delay

Language disorders in children, as well as the normal development of linguistic sophistication, can have an impact upon the ability to speak fluently. Although the relationship between stuttering and language delay is not clearly understood, the effect of language disorders upon fluent speech production are beginning to be explored (Culatta & Leeper, 1988). Hall (1977) reported that after initiating language therapy with two severely language-impaired children, they both became highly disfluent. He stated that once their linguistic skills improved during a language-centered treatment program, their disfluencies decreased. Hall et al. (1986) also presented a clinical report of a severely language-delayed child who became highly disfluent upon the initiation of language treatment. The disfluencies seemed to accompany increases in expressive language skills. Events followed the same course as in the Hall (1977) study. As the child's language skills continued to increase, disfluencies decreased. Merits-Patterson and Reed (1981) found that language-disordered children who received speech-language services were more disfluent than their language-delayed counterparts who were not receiving speech-language services. The symptoms described in these studies highlighted part-word repetitions, prolongations and dysrhythmic phonations. Not only are the disfluencies of language-delayed children different from those of stuttering children, they also appear to be different from those of normally developing children. Yairi and Clifton (1972) reveal that the disfluencies exhibited by normal language learning children were characterized by revisions in the form of incom-

plete phrases, with word repetitions also frequently occurring. Part-word repetitions were not a significant portion of the disfluency sample presented by these children.

Studies that have examined the relationship between disfluency and delayed or emerging language skills are not in agreement as to the reasons these behaviors co-exist. Colburn and Mysak (1982) feel that the disfluencies might serve a language learning purpose by allowing for practice of new structures. The disappearance of the disfluencies once the linguistic structures are mastered has been reported in a review by Helmreich and Bloodstein (1973). Culatta and Leeper (1987) interpret the information presented thus far as an indication that complex language tasks increase the disfluent behaviors of all children and that the demands of language treatment may have the side-effect of increasing the disfluencies of language-delayed children. A critical point seems to be that the rise in disfluencies seems to occur with the child's attempts to use the new linguistic processes learned in language treatment. Thus, these disfluencies appear to be a by-product of linguistic stress.

How the disfluent speech of language-delayed children is conceptualized may have an impact upon treatment strategies. The behaviors may be judged as "stuttering" or they may be viewed as Sabin et al. (1979) suggest, "vocal hesitations" that are a part of learning language. As "hesitations" they may signal a failure in verbal planning and execution and be viewed within the context of a language-based, rather than a stuttering-based, framework (Butterworth & Goldman-Eisler, 1979). For example, reformulations of thought in a stuttering-based conceptualization are classified as "revisions" which correct an error in production, clarify or change meaning (Adams, 1982). As "linguistic hesitations" they are identified as "false starts" which can be viewed as the best indicators of high level verbal planning failure" (Butterworth & Goldman-Eisler, 1979).

The implication derived from this limited review of the literature is that diagnosing and treating language-based fluency failure as stuttering could waste valuable and limited intervention time. Hall et al. (1986) suggest that clinicians consider the primary nature of the communication disorder when planning treatment intervention strategies. Clinical reports seem to indicate that the initial rise in disfluency in language-delayed children is not indicative of an emerging stuttering disorder but rather the result of the struggle by the child to meet the newly introduced, more stringent, language rules imposed by treatment.

Adams (Personal Communication, 1987) has suggested another possibility. He speculates that as treatment progresses a child gains more internal language. However, the child may not yet be facile in making appropriate selections of new language responses and inhibiting old and less appropriate ones. What is more, the child may not yet be skilled in the translation of internal language into motor commands and in the execution of these commands. Fluency failure may then result because of linguistic and/or motor immaturity. Adams believes that, "if that were indeed the case, the fluency failures could legitimately be viewed as disfluencies much (or exactly) like the ones evidenced by normal youngsters." For speech-language pathologists, this po-

tential conflict may be resolved by the somewhat limited data that seems to indicate that maintaining language treatment, increasing communication skills in spite of emerging disfluencies, will eventually alleviate what appears to be a temporarily created fluency failure.

SUMMARY

This article attempted to present an outline which the speech-language pathologist might employ to understand and differentially diagnose the different types of disfluency disorders that clients present. It was emphasized, by comparing and contrasting the different case history information and disfluency patterns possible, that not all disfluencies should be characterized as stuttering because the result would be an inefficient as well as inaccurate approach to the client's speaking difficulty. It follows that treatment strategies must be radically different depending upon the accurate identification of disfluency categories. It was suggested that though in most cases the speech-language pathologist will be the primary service provider, there exist possibilities wherein referral to other professionals, or team intervention may be critical for effective management.

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