Cluttering: A Synergistic Framework
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Introduction

Cluttering is a neglected area in research and in speech and language pathology courses. Part of the difficulty of studying cluttering lies in its apparently multifaceted and nebulous nature. Despite the multitude of symptoms that have been associated with this disorder at one time or another, there nonetheless appears to be a degree of consensus among clinical speech-language pathologists regarding what are perceived to be essential and what are considered to be optional symptoms.

In their questionnaire study to which over 150 speech/language pathologists responded, St. Louis and Hinzman (1986) provided a list of 29 symptoms which have been associated with cluttering. Respondents were asked to indicate whether a symptom would be considered to be essential or optional. Among the symptoms deemed obligatory were fast/irregular speech rate, disorganized thinking, repetitions of sound/syllables or phrases, and a lack of awareness of the problem. The "average" perceived optional symptoms included misarticulations, language delay, motor coordination problems, and academic achievement difficulties. (See also Chapter 2.)

Moreover, most of the clinicians suspected that cluttering is due to some organic origin. Although we do not have conclusive evidence that cluttering is organically based, a number of clinical observations would appear to point in the direction of an inherent predisposition for cluttering. The earlier Europeans, in particular, favored an organic perspective on cluttering. Weiss (1964) pointed to the motor deficiencies, hyperactivity, and impulsivity of clutterers as clinical signs of organicity.

While some clinical researchers found abnormal EEGs in their examination of clutterers (e.g., Moravek & Langova 1962), others did not. Some have reported a sex ratio related to cluttering. Arnold (1960), for example, reported that cluttering occurs in males with four times greater frequency than females. If this sex ratio is confirmed with additional studies, then one may hypothesize a sex-linked trait associated with cluttering.

In this same survey by St. Louis and Hinzman, respondents were requested to indicate the types of therapy used for clients judged to be

clutterers. Priority was given to rate, articulation, and language therapy, whereas therapy techniques traditionally associated with stuttering received a lower percentage of usage. One can draw two conclusions from these results in regard to the perspectives taken by practicing clinicians. The first is that practicing clinicians view the symptoms of cluttering as comprised of more than disfluencies alone and, secondly, that treatment approaches extend beyond therapy techniques traditionally associated with stuttering therapy.

The present chapter attempts to provide a framework for generating research, and exploring clinical issues in the management of individuals exhibiting symptoms of cluttering. Three working assumptions about the nature of cluttering are considered. They are derived from the clinical literature as well as from recent empirical studies of the disorder. These assumptions do not define cluttering but are offered as means to develop certain theoretical constructs, to be discussed later in the chapter, which in turn can serve as springboards for thoughts on the clinical management of individuals considered to be clutterers.

The first assumption is that there are coexisting anomalies of speech and language in individuals exhibiting cluttering symptoms. Secondly, in view of the concomitancy of symptoms, it may be worthwhile considering these speech and language behaviors from a systems approach, in a manner similar to that discussed by McDonald (1964) in his sensorimotor approach to coarticulation. That is, aspects of the linguistic, articulatory and suprasegmental components, including rate and fluency of the communication system, have the potential to function interdependently. Thirdly, the notions of "synergism" and "synchrony" are held to be highly salient in our continued efforts to chart future directions in research and therapy for individuals exhibiting cluttering.

Since cluttering has traditionally been considered a disorder of fluency and timing, the notion of rate will be examined closely. The role of the servosystem will be considered as well, given that some clutterers are not good at monitoring their speech and language functions. Finally, the chapter will conclude with discussions of cluttering in relation to stuttering and language/learning disabilities.

Cluttering As A Fluency Disorder With Concomitant Language, Rate and Articulation Problems

The notion that cluttering is a multidimensional disorder is not new (see Daly 1986). The early European writers on the topic viewed cluttering as "the verbal manifestation of Central Language Imbalance, which affects all channels of communication (e.g., reading, writing, rhythm, and musicality) and behavior in general" (Weiss 1964, p.1). Weiss characterizes cluttering as a disorder of rate, language formulation, and articulation, with a marked lack of awareness of one's communication difficulties.

Although it is not possible at this point to explain the relationship among the symptoms cited by Weiss and others, the following are some possibilities: 1) there exists a basic underlying Central Language Imbalance reflecting poor organization of thought and language processes which disrupts fluency, articulation, and the overall coherence of communication; 2) a disrhythmic or exceedingly fast tempo (a rate faster than the speaker can accommodate) disrupts the speaker's motoric and linguistic fluency, resulting in misarticulations and disfluencies; and 3) difficulties in on-line monitoring or repairing of communicative breakdowns aggravate a speaking style which is already fragmented and lacking in cohesiveness.

In the first instance, weaknesses in the linguistic encoding of one's thoughts (e.g., word retrieval skills) are reflected in a lack of coherence of communication efforts. We see such behaviors in the language/learning-disabled population (Wiig & Semel 1984) as well as in patients with Alzheimer's disease (Ripich & Terrell 1988). When thoughts and basic linguistic encoding skills are disrupted, it would not be surprising also to find that speech processes reflect a degree of disfluency as well. Not knowing how to say something is reflected in false starts, repetitions of words and phrases, incomplete phrases and revisions.

Regarding the second possibility cited above, a number of authors have considered rate to be basic to the clutterer's problems. Some have observed clutterers' speaking rate to be excessively fast; others have conjectured that the irregular rate with brief periods of very high speech rate to be more problematic than the overall rapidity of speaking rate. As will be discussed later in this chapter, the notion of absolute vs. relative rate may be relevant to the discussion at hand.

Is the clutterer's overall absolute speaking rate, as measured by such indices as syllables per second, faster than the normal range? Is a fast rate

in absolute terms a necessary condition for an individual to be considered a clutterer? Or, is it more the case that the clutterer's speaking rate is faster relative to the capacity of his or her system? If the clutterer is speaking faster than the system can handle, is it the case that the linguistic and articulatory components lose synchrony and therefore synergy, giving rise to misarticulations, disfluencies, and linguistic anomalies?

The demands vs. capacity model of communication in relation to speech fluency has been discussed by several authors in recent years (e.g., Andrews, Craig, Hoddinott, Howie & Neilson 1983; DeJoy & Gregory 1985; Starkweather 1987). Some individuals speak rapidly and yet maintain a high level of motoric and linguistic fluency. We would not typically attribute any pathology to these speakers. In fact, such individuals may be highly sought after in certain professions, such as television and radio broadcasting, because of their rapid and fluent speech. Other speakers have difficulty maintaining fluency and articulatory integrity even though they speak at a rate which is comparable to others of similar age. Therefore, it may be more valid to consider rate relative to one's own ability and relative to the other constraints concurrently imposed on the speaker's system, rather than rate as compared to some outside standard. As rate exceeds one's ability to handle the motor sequencing necessary for speech, for example, symptoms such as deletion of weak syllables and final consonants or cluster reduction occur.

The third possibility cited above postulates that a distorted or muted servosystem has relevance for the coexistence of speech and language anomalies seen in many clutterers. We do not know the nature of the relationship between deficits in monitoring feedback and the speech and language anomalies seen in clutterers. Is there a causative link between the two? Does an inefficient servosystem directly impair communicative functions? Or, does a poor monitoring system simply aggravate existing speech and language malfunctions? Or, is it the case that some clutterers have a general sense that their message is not coming across efficiently but they are unable to repair the message breakdown? Future research is needed to answer these questions.

A Systems Approach To Cluttering

If we accept the premise that cluttering is likely to be a multidimensional disorder with coexisting problems, it may be fruitful to consider the

associated symptoms from a systems approach. A systems approach views the speech and language functions of communication not as independent but as interrelated entities.

Numerous examples of this interrelationship exist for both normal as well as abnormal speech and language behaviors. As we increase the length of utterances, for example, we are also likely to increase the rate and complexity of articulatory movements. From the stuttering literature, we know that rate as well as length and complexity of utterances can affect fluency (Bloodstein & Gantwerk 1967). Children are more vulnerable to disfluencies when encoding longer and syntactically more complex sentences (Gordon et al 1986).

From a clinical viewpoint, at least, it would make sense to consider the coexisting anomalies of cluttering as a complex of interrelated behaviors. Effecting change in length and complexity of utterances (or complexity of larger chunks of narratives) is likely to effect change in the fluency domain.

Therapy should strive for a synergistic interaction, one in which the various components of the communication system (thought, language, rate, articulation) interact in an increasingly cohesive and synchronous manner. The latter terms deserve further comment.

The field of communication disorders, and particularly the area of fluency disorders, has recently moved closer toward the notion of the coexistence of disorders (Cullinan & Springer 1980; Louko et al 1990). This may, in retrospect, be viewed as a shift in scientific paradigm, as discussed in Chapter 1 by Myers and St. Louis.

One consequence of this paradigm shift is that we need to look at subgroups of disfluent clients (see Preus 1981, 1987), much in the way that Cullinan and Springer (1980) did in their voice initiation time study in which subjects were divided into a group of pure stutterers, a group of stutterers with other concomitant problems, and a group of controls. If it is the case that a fair proportion of our disfluent clients have coexisting anomalies, we need to channel some of our therapy efforts toward helping clients to achieve a greater degree of cohesiveness or integration between the speech and language functions.

Sequences of speech movement are executed with great rapidity. According to Starkweather (1987), we speak at a rate which is quite close to the upper limits of our capacity. If it is the case that clutterers speak more rapidly than their systems can handle, and given the likelihood that clutterers may also experience inherent language difficulties, the need to

approach this pathology from a synergistic framework would appear to be compelling.

The need for synergy between speech and language is made salient in Bates and MacWhinney's **functionalist** model of communication (1979). That is, the various complex, nonlinear, and multifaceted aspects of language (e.g., the intent, the meaning, and the grammatical/phonological structure of language) must somehow be integrated and filtered through the very fleeting, linear channel of speech. The rapidity of speech imposes great constraints on the language and speech output system. Rate which is too fast is likely to give rise, for example, to misarticulations and disfluencies.

Disfluencies can be viewed as only the surface features of underlying anomalies of the communication system. Specifically, disfluencies surface in the presence of 1) underlying anomalies of rate, coarticulation (or other aspects of the speech production system), or anomalies in linguistic encoding; 2) underlying dissynergy of two or more of these domains (particularly in the presence of a servosystem which is not good at detecting or repairing breakdowns). Therapy principles and techniques derived from this perspective are outlined in Chapter 6.

Suprasegmental Considerations: Rate and Fluency

Clutterers have often been characterized as speaking with a fast or irregular rate. We need to examine rate more closely before drawing conclusions. Rate can be examined from a number of different perspectives.

We can look at the speaking rate of an individual and determine whether it is faster or slower than the normative data for individuals of comparable age on comparable speaking tasks. Adults, for example, generally speak about five to six syllables per second (Starkweather 1987). This seemingly straightforward measure of rate, however, may not be so straightforward when we examine more closely the nature of the spoken passage upon which rate is calculated.

The discourse of clutterers, most would agree, contains more disfluencies than that of speakers without a fluency disorder. Would the speaking rate of the clutterer whose discourse contains fifteen percent syllables disfluent be comparable to the same speech rate obtained from a speaker found to have only three percent syllables disfluent? Perhaps not.

Further, a rate of speaking driven by predominantly fluent speech may not be qualitatively equatable to the same speaking rate carrying a high

proportion of disfluent speech. Syllables carrying disfluencies (reflecting underlying anomalies of some sort) may not be equivalent to syllables uttered fluently. A passage containing interjections (e.g., "Well, you know, what I mean is, I like it.") may not, for example, be equatable to a passage spoken at the "same rate" but containing no interjections (e.g., I like it a lot since it's so handy.) even though both passages contain ten syllables and both were spoken in 1.5 seconds.

The speaker of the second passage is very much in control of what he wants to say and how he says it, unlike the form, content and execution of the first passage. In the larger scheme of fluency as a domain of study, therefore, we need to consider fluency not only in terms of the sheer rapidity of articulatory movements, but also the amount of linguistic fluency and meaningfulness carried by those sequences of motor acts.

In his thought-provoking article entitled "What Is Stuttering?" Perkins (1990) re-examines some of the most basic questions and assumptions held about stuttering. He makes the point that some individuals are disfluent because they know what they want to say but their attempts to say it are involuntarily interrupted. For such individuals, language formulation is not the primary cause of the disfluency.

Another group of disfluent individuals experience linguistic uncertainty as the primary area of difficulty. That is, they are not very fluent linguistically, due to problems in formulating utterances that make sense (coherent), that hang together (cohesive and synergistic), and that are well-timed to the temporal constraints imposed on the speech production system as well as by outside sources (such as the partner's pacing of the dialogue).

This distinction between disfluencies triggered by motoric vs. linguistic anomalies is important, and may have great bearing on how the various aspects of suprasegmental anomalies - including rate and fluency - are viewed. The clutterer who speaks rapidly but with a large number of incomplete phrases and revisions as if searching for an appropriate word or phrase is likely to be disfluent in a different sense than the stutterer experiencing blocks and struggle as he or she searches for the appropriate sequences of speech movements. Such differences may reflect Bloodstein's (1987) distinction between "repeated utterances" and "repeated stoppages," offered as a marker differentiating cluttering and stuttering in Chapter 6.

Rate also needs to be considered from the perspective of the "demands and capacity" construct (Andrews et al 1982; Starkweather 1987; Adams

1990). According to Starkweather, most speakers produce speech at a rate very near to the upper limits of their capacity. One implication of this is that even if a clutterer's speaking rate is comparable to that of normal speakers, his or her rate may be too fast relative to the limitations set by his linguistic and motoric capabilities. Adams (1990) discusses the vulnerability of fluency when the demands placed upon a child stutterer exceeds the child's capacity. Although applied to young adult stutterers, the notion of "comfortable rate" by Brown et al (1990) may be related to the construct of "relative rate" discussed above for clutterers. Brown et al found that young adult stutterers were both slower and showed more constrained variability in their performance on three self-paced rhythmic speech and nonspeech tasks.

Similar research is needed to test the hypothesis that clutterers might be found to be faster and "less constrained" in speech patterns. Brown et al interpreted their finding that stutterers showed more constrained variability to reflect a less flexible system. The capacity to vary, therefore, is considered an asset in this context. Clutterers may be found to demonstrate greater variability, but variability which is less modulated, less constrained, and less tempered. The latter is due largely to anomalies in the governance of rate, but possibly also due to a poor servosystem.

A third perspective on rate, particularly as regards the perception of an erratic or irregular rhythm, can be viewed in terms of the loci of disfluencies relative to the meaning junctures of the message. We are talking about the temporal patterning of larger units of meaning in discourse. Unfilled pauses occurring at thought and sentential junctures, for example, are less disruptive to the listener than pauses that occur at unexpected loci (Wingfield et al 1984). A listener's ability to predict, therefore, needs to be considered in judgments of fluency and rate. This perspective may be related to the observation by some that a clutterer's speech rate is erratic and irregular, rather than (or in addition to) its being too fast.

Type of disfluency also needs to be considered, in addition to loci and quantity of disfluency, as influencing factors on listener perception of rate. In contrast to Track I clients, Van Riper's Track II clients (often referred to as the cluttering subgroup of stutterers) exhibit the following types of disfluencies: more silent gaps, more hesitations, more stumblings, more abortive beginnings, more revisions, more interjections, more back-ups, more retrials, more changes in direction. These types of disfluencies add

greatly to the disjointedness of discourse, since the listener expects a forward ongoingness and completion of information rather than a series of starts and stops. The typical stutterer is likely to struggle to complete a syllable in a word which is known to both speaker and listener. The advanced stutterer gets stuck at specific moments of blocks; the disfluencies of clutterers are less discrete and less confined to a given syllable or vowel. The clutterer appears to be unable to formulate a word, phrase or thought. Consequently, the clutterer's narrative ladened with incomplete phrases and revisions is neither fluent, nor coherent, nor informative.

A frequent admonishment to listeners of stutterers, on the other hand, is "not to finish the sentence for him," implying that the stutterer's utterances are often quite coherent in spite of the disfluencies; however, he has difficulty in saying the word he has in mind or completing that word. Therefore, the perception of tempo anomalies may be contributed not only by a fast rate but also by incoherency due to the prevalence of certain types of disfluencies occurring at perceptually awkward loci. Further research is needed to examine this area.

Servosystem

Because many clutterers may not be very attuned to their speech and language difficulties, they seldom self-refer. They are not aware of the impact that their communication disorder has on the diminished ease of listener perception. In fact, adult clutterers often become annoyed when their disfluencies or misarticulations are pointed out to them. We have found some clutterers to react incredulously when presented with a tape recording of their speech. This is in sharp contrast to most adult stutterers who are quite aware that they have a speech problem, and who can be quite focused on their disfluencies during a block or in anticipation of a block. Even though it may be difficult to measure awareness, Perkins (1990) argues that ultimately it is the feeling of a loss of control by the speaker that defines stuttering.

Track II individuals, according to Van Riper (1982, p. 100), "do not seem to listen to themselves." Acuity of the servosystem may be a productive area to investigate in the differential diagnosis of cluttering and stuttering, particularly during later stages of development.

Relationships Between Cluttering, Stuttering, and Language-Learning Disabilities

One of the most critical questions to be addressed is the relationship between cluttering and stuttering (Weiss 1964; Van Riper 1982; Preus 1987, Chapter 4), as well as between cluttering and language/learning disabilities (Tiger et al 1980; Daly 1986; Myers 1990).

A paucity of literature on cluttering exists. This may have been due to our preoccupation with "typical" or "pure" stuttering, at the expense of giving due attention to other types of fluency disorders as well as to the study of normal disfluencies. At this point, however, we cannot be entirely certain what constitutes "typical" stuttering nor the relationship between typical vs. pure stuttering, as addressed by Nippold (1990). The situation has in part been rectified by increased efforts in defining the parameters of normal fluency behaviors (e.g., Yairi 1981; Starkweather 1987) as well as greater interest in attributes of the so-called "atypical stutterers" (see St. Louis 1986). Our ability to define stuttering and cluttering rests heavily on our ability to differentiate 1) between normal from pathological disfluencies; 2) among the different kinds of fluency disorders; and 3) among subgroups within a particular fluency disorder. The particular confluence of coexisting anomalies during any given period in a client's developmental history may be a major determinant of: 1) the particular subgroup to which this individual belongs at that period in time; 2) the specific nature of disfluencies exhibited; and 3) the treatment approach most suitable for that individual. These considerations are discussed further in Chapter 6 concerned with assessment and treatment from a synergistic framework.

The neglect of cluttering may also have been due to the fact that, until relatively recently, our field has not fully acknowledged the possibility that coexisting anomalies in individuals with disfluencies is more than a coincidental or chance occurrence. Disfluent children can have language problems (Wall & Myers 1984); language and learning-disordered individuals can have fluency and articulation problems (Merits-Patterson & Reed 1981; Wiig & Semel 1984; Myers 1990); children with phonological delays can have coexisting syntactic and fluency problems (Swafford & Reed 1986; Louko et al 1990).

Several theoretical postulates are possible on the relationship between cluttering, stuttering and language/learning disabilities. One possibility is that individuals belonging to a subgroup of stutterers begin as clutterers

during childhood and as the disorder progresses, the symptoms acquire more stuttering-like qualities (i.e., hard blocks, effortfulness, struggle, physiological tension). This position was favored by Freund (1952) and Weiss (1964). A second possibility is that stutterers acquire more cluttering-like attributes as severity increases. Thirdly, clutterers and stutterers are really distinct entities with no overlap. And, fourthly, an individual can have both stuttering and cluttering symptoms concurrently. The varying degrees of overlap between stuttering and cluttering may, in turn, yield significantly different subgroups of clutterer-stutterers, each of which require different clinical approaches. Research is needed to evaluate the merits of these possibilities.

When attempting to differentiate stuttering and cluttering it is important to consider the point in the evolution of the fluency disorder at which this differentiation is made; that is, whether one is talking about the disorder at its incipient stages or at a later stage of development. This consideration is in part motivated by the fact that a fluency disorder at its incipient stages usually occurs at a time during childhood when all aspects of the communication system are developing. During this period, behavior is less stable and more vulnerable to breakdowns. It is equally important to consider the point in the developmental evolution of the child's cognitive, linguistic and motoric system. If one views these major parameters of communication from a systems approach, then the degree of synergy of interaction between the child's language, articulatory and fluency/rate behaviors at specific points in development needs to be examined. (See Chapter 6 for illustrations of how these behaviors can interact.)

It is also important to consider whether the differentiation between stuttering and cluttering relates to the presumed etiology or to the symptomatology of the disorder. The following symptomatologies are offered as possible differentiating factors between stuttering and cluttering, at least at the more advanced stages of development.

We are all familiar with the effortful struggle behaviors often characterizing stuttering. From what we have observed of individuals considered to be clutterers, on the other hand, they do not exhibit effortful struggle behaviors. Few clutterers exhibit secondaries. Clutterers also appear to be distinguished from stutterers by having fewer sound/syllable repetitions, prolongations, and instances of struggle (St. Louis et al 1985). Most stutterers are also quite cognizant that they have problems in speaking, during and at times before the stutter comes. They verbalize a

keen sense of awareness that "the sound just won't come out, my mouth gets stuck." Even some outwardly symptom-free stutterers profess a great deal of tension and a sense of loss of control (Perkins 1990). As has already been discussed, clutterers by and large do not share this acute awareness of their disfluencies.

Finally, it may be fruitful to distinguish disfluencies which are motorically disrupted from disfluencies which are linguistically disrupted, in order to provide insight into the relationship between stuttering, cluttering and the disfluencies observed, especially in longer narratives, of the language/learning-disabled populations. Disfluencies which are due to specific moments of motoric disruptions reflect a speaker's efforts to search for the motor coordinations necessary to produce sequences of articulatory gestures in a smooth and ongoing manner (Zimmermann 1980; Peters et al 1989). Disfluencies which are due to linguistic disruptions reflect a speaker's efforts to search for the desired word, phrase, or proposition. Clutterers may be particularly vulnerable to speech breakdowns emanating from language difficulties.

Peters and Starkweather (1990, p. 120) proposed the following:

> "children for whom cluttering has been a source of stuttering are particularly interesting because in these children, limitations in language competence can directly influence speech production."

These two classes of disfluencies are not necessarily mutually exclusive, but perhaps it is the case that clutterers and language/learning-disabled individuals exhibit with greater frequency, disfluencies which are due to language formulation difficulties, compared to the "typical" adult stutterer. Normal speakers also exhibit linguistically motivated disfluencies. We repeat words or use filled pauses (um, uh) to hold our place in discourse, until we find a suitable word or phrase to utter. However, seldom do clutterers or normal adult speakers need to resort to audible/inaudible prolongations and struggle behaviors to continue discourse. In this sense, Bloodstein's view that stuttering is not so much repeated utterances as repeated stoppages may be pertinent in distinguishing stuttering and cluttering.

Summary And Conclusion

This chapter has attempted to provide a synergistic framework for the study of cluttering. The bases of this perspective were drawn from clinical

observations, research findings reported in the literature, as well as heuristic contemplations. The tenets of this framework were founded on a number of constructs which may have clinical, research, or theoretical appeal. The following is a summary of the major constructs discussed:

1. There are coexisting anomalies of speech and language in individuals exhibiting cluttering symptoms. In view of the concomitancy of symptoms, it may be worthwhile to consider these speech and language behaviors from a systems approach. That is, aspects of rate, fluency, language, and coarticulation have the potential to function interdependently.

2. The notions of synergism and synchrony are held to be highly salient in our treatment and understanding of cluttering. Somewhat analogous to the discontinuities created by fault lines on the surface of the earth indicating some underlying displacement, disfluencies in speech may be sensitive surface indicators of more significant underlying anomalies of rate, language and coarticulation. In other words, when there is dissynergy or dissynchrony within or between components of the communication system, a likely behavior to surface is disfluency.

3. The phenomenon of rate is more complex than heretofore considered, particularly as it relates to cluttering. Rate can be considered in a number of dimensions, including the following:
      a. rate compared to normative data;
      b. rate relative to the ability to sequence speech movements;
      c. rate relative to the ability to formulate and encode propositions;
      d. regularity of rate as a function of the loci of disfluencies and the meaning junctures of an utterance;
      e. appropriateness of the rate for communicating information.

4. The acuity of the servosystem interfacing one or more aspects of the communication system (e.g., rate, fluency, language, coarticulation) appears to be diminished in many clutterers.

5. Disfluencies need to be considered in the context of longer discourse and

narratives, particularly for individuals whose disfluencies may be linguistically motivated.
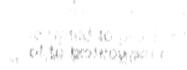
6. Disfluencies emanating from "essential" stuttering - as defined by Wingate (1964), Andrews (1987), Starkweather (1987) and others - may be motivated by different aspects of the communication system compared to disfluencies emanating from "essential" cluttering.

A better understanding of the underlying nature (e.g., motorically-based vs. linguistically-based disfluencies) of the different types of disfluencies (e.g., tense pauses vs. incomplete phrases/revisions) will help us gain insight into the relation between stuttering, cluttering, and the disfluencies exhibited by language-learning disabled individuals.

Conclusion

The study of cluttering may prove to be a particularly appealing and fruitful endeavor. If cluttering indeed represents a microcosm of the various speech and language disorders (Perkins 1978), then a better understanding of cluttering may also shed light on how the various aspects of the communication system act and interact.

Knowledge gained about cluttering will also help us better understand stuttering, and the critical relationship that exists between stuttering and cluttering. Additionally, the speech-language behaviors constituting cluttering - as well as the underlying motivations of such behaviors - may provide clinicians and researchers alike a broadly-based context to examine how communicative behaviors can go awry when the various speech and language functions of the system do not interact with synergy and synchrony.