



---

# The Existence of Stuttering in Sign Language and other Forms of Expressive Communication: Sufficient Cause for the Emergence of a New Stuttering Paradigm?

Greg Snyder

---

## Abstract

While reports of stuttering-like behaviors occurring in sign language have been available for almost 70 years, relatively little attention has been given to its existence and how the existence of stuttered sign may impact our understanding of the stuttering phenomenon. This manuscript provides a brief literature review of stuttered sign and offers a list of potential stuttered sign behaviors. Data is presented suggesting that stuttering is a phenomenon occurring in expressive communication, rather than speech and sign alone. Consequently, it is proposed that the prevailing theoretical constructs fail to account for stuttering in expressive modalities other than speech. It is suggested that the field of speech-language pathology reevaluate and possibly abandon the current pre-paradigmatic views concerning the nature of stuttering so that another perspective can emerge that better accounts for the stuttering phenomenon.

---

## State of the Art in Stuttering Science, Theory and Treatment

Speech-language pathologists and other scientists associated with the field have been debating the nature and definition of stuttering for decades (Bloodstein, 1995; Conture, 2001; Guitar, 2006; Starkweather, 1987; VanRiper, 1982; Wingate, 1964). It is reasonable to suggest that such a task is inherently difficult, as the core pathology remains elusive and the behavioral manifestations variable (Bloodstein, 1995; Conture, 2001; Guitar, 2006; Starkweather, 1987; VanRiper, 1982). Subsequently, an oversimplified examination of the stuttering literature (from the 20th and 21st century) reveals that nearly all the differing views on stuttering could be distilled into three prevailing paradigms. (To keep things simple, I have labeled the three competing views on stuttering paradigms, when they are all at best pre-paradigmatic.) The first would have to be a psychological perspective on stuttering, which at its core suggests that stuttered speech results from some type of anxiety tension experienced by the speaker (Bloodstein, 1995; Johnson, 1950; Sheehan, 1970; Van Riper, 1982). Those within this paradigm would focus on the reduction of speech-related anxiety and speech-avoidance as well as the acceptance of stuttering and self as core tenets for stuttering modification treatment (Bloodstein, 1995; Johnson, 1950; Sheehan, 1970; Van Riper, 1982). Another paradigmatic view on stuttering would be to suggest that stuttering results from (behavioral) incoordination within the speech motor mechanisms (Shine, 1980; Starkweather, 1982, 1987; Webster, 1977b). Those within this paradigm would likely focus their fluency shaping treatment on retraining speech coordination, in hopes that the newly acquired speech patterns would be incompatible with stuttered speech and would also become habitual (Shine, 1980; Starkweather, 1982, 1987; Webster, 1977b). Finally, an emerging third paradigmatic view of stuttering would likely suggest that stuttered speech is the result of errors in speech-related neurological anatomy or processing (Alm, 2005; Wu et al., 1995, 1997). Those within this paradigm may judiciously select treatment strategies from both stuttering modification and fluency shaping,

---

while incorporating other treatments (such as pharmaceuticals and prosthetic speech feedback devices) that they believe alter or bypass the deviant speech-related neurophysiological malfunction (Kalinowski & Saltuklaroglu, 2006; Snyder, 2004).

When faced with the reality of competing paradigmatic views of stuttering, Yairi & Ambrose (2005) opine, "It is our position that, whatever else the clinical disorder of stuttering entails, there seems to be relatively little disagreement that the term stuttering refers to the domain of motor speech production and its disruption by speech disfluencies. Physical, physiological, cognitive, and emotional components, regardless of how frequent or intense they might be, would not be labeled as 'stuttering' if they did not accompany a speaker's disfluent speech" (p. 19). Yairi & Ambrose extend their position by stating that stuttering "is first and foremost a disorder of speech" (p. 84).

### **If only reality could be so simple...**

One day, a student (GW) walked into my office to inquire about stuttering. He was hard of hearing (HH) and used amplification. While he was an effective oral communicator, he also was proficient in American Sign Language and the simultaneous use of speech and sign (SimCom). GW stuttered in both speech and SimCom and was looking for guidance on a thesis he was writing on stuttering in sign language. GW came to ask me what was known about stuttered sign and what it might look like in other signers.

Ok, I'm going to be honest--while I was familiar with the accounts of stuttered sign language (Silverman & Silverman, 1971; Montgomery & Fitch, 1988), it was hard for me to consider this phenomenon as particularly valid, as it did not make much sense to me at the time. And this sort of scientific tunnel-vision is a documented phenomenon, as Thomas Kuhn suggests that when data falls beyond the accepted paradigm or theoretical framework, it is largely disregarded or ignored (Kuhn, 1996).

### **But it's hard to disregard a phenomenon being demonstrated by a student sitting in your office.**

Consequently, the sudden and dramatic cessation of my denial to the existence of stuttered sign was quickly followed by a review of the literature:

- The oldest account in which I have found is a report from 1937 detailing "stuttering" and "secondary manifestations" of a congenitally deaf child (Voelker & Voelker, 1937).
- Next was a study by Backus (1938), which surveyed oral schools for the deaf, and asked teachers to report if any deaf or HH students in their school stuttered either verbally or in sign. Results suggest that 55 students were identified as exhibiting stuttering behaviors out of the 13,691 students enrolled. This represented approximately 0.4% of the sampled population.
- Harms & Malone (1939) also surveyed oral schools for the deaf, and found that a total of 42 students out of 14,458 were identified as having stuttered either in speech or in sign. Of the 42 students identified, eight were considered deaf; however, four of these eight had acquired speech and stuttering prior to losing their hearing. The remaining 34 students identified were HH and were reported as children who stutter. No clear distinction was made if these 34 students demonstrated stuttered speech, stuttered sign, or stuttered SimCom.
- Wingate (1970) provides a brief account of previous views on the existence of stuttering in the deaf and HH populations, as well as data on the incidence and prevalence of stuttering in the deaf and HH populations prior to 1970.
- Silverman & Silverman (1971) surveyed 78 teachers of the deaf and HH at residential schools. Of the 78 surveyed, 33 teachers responded. The survey results revealed that 13 students had

demonstrated stuttering-like behaviors. Silverman & Silverman detailed some commonly reported stuttered sign characteristics, which suggested that stuttered signing appears to be more frequently associated with finger-spelling and often results in the repetition of a sign or initial letters of finger-spelling. Silverman & Silverman also reported behaviors including involuntary interjections of extra movements in finger-spelling, hesitations in finger-spelling, and that the stuttered-sign phenomenon also occurred in SimCom.

- Montgomery & Fitch (1988) surveyed 150 schools for the hearing impaired, of which 77 schools replied. Of the 9,930 students represented in this sampled population, 12 were reported to demonstrate stuttering behaviors in either: speech, sign, or SimCom. This represented about 0.12% of the sampled population. Three of the 12 were reported to stutter only in oral communication. Six of the 12 were reported demonstrated stuttering-like behaviors (solely) in manual communication, and were reported to demonstrate a wide variety of stuttering-like behaviors, such as effortless repetitions of signs and on initial letters in finger-spelling, as well as "blocking" on sign productions. Three of the 12 reported students who stutter demonstrated stuttering-like behaviors in SimCom. These behaviors included similar characteristics in both speech and sign, such as repetition of initial syllables (spoken) and letters (signed), as well as repetitions of words and phrases, "blocks" on words, and prolongations on sounds and signs.
- The most recent published study that I have found is Liles, Lerman, Christensen & St. Ledger (1992), which chronicled the behaviors of a young male with an intellectual disability. Their findings suggested that the boy demonstrated disfluencies in speech and SimCom, characterized by repetitions, prolongations, and blockages. The authors also noted that stuttering-like behaviors were synchronous across communicative modes (oral and SimCom), a finding also implied by Montgomery & Fitch (1988).

After re-reading the literature from a perspective that was more accepting relative to the existence of the stuttered sign phenomenon, I began noticing synchronous disruptions in speech and sign in my own SimCom. Quite simply, when my mouth was stuttering, my hands would cease signing and patiently wait for the (oral) stuttered moment to pass. But this got me thinking--was my signing stuttered, or were the manual disruptions in my sign secondary (i.e., symptomatic) to my primary mode of (spoken) communication? In other words, were both modes of communication subject to breakdown from a single process, or could the two modes of communication (speech and sign) function independently? To informally test this question, I attempted to train my hands to continue signing, regardless and independent of any stuttered speech that might occur. Within a month, I had trained myself to successfully disassociate my spoken and signed modes of communication with a very large degree of success. As my speech broke down, my signing would continue. However, this independent functionality was limited to the difficulty of producing two asynchronous expressive communications at once. When my two asynchronous expressive communication signals within SimCom get over a phrase apart, I have to stop altogether and restart synchronously.

Additionally, during my initial research into the stuttered sign phenomenon, I also began informally inquiring within the deaf community if others had observed stuttering-like disfluencies in native signers. And while these accounts are all secondhand, at least two ASL interpreters did directly observe stuttering-like behaviors in native signers. One colleague that had attended graduate school at Gallaudet University described a college peer, Daniel (a pseudonym), who would inexplicably initiate signing by tapping his hand on his chest. Subsequently, his name-sign evolved into the "d" handshape tapped on the chest. Another account was noted by a Gallaudet University student who was an ASL interpreter and speech-language pathology graduate student. She reported signing with a number of native signers that demonstrated a variety of stuttering-like disfluencies. However, this interpreter was unsure if the deviant signing was best described as stuttered or cluttered sign, as stuttered sign has not been clearly identified or operationally defined, thus making an apparent diagnosis difficult.

---

So in conclusion, data suggests that the stuttered sign phenomenon exists. Survey results also suggest that while this phenomenon seems more prevalent in SimCom, it also exists in manual signed communication as well. Finally, while the incidence and prevalence of stuttered sign in the deaf or HH population does seem to be significantly less than in the hearing population, it appears to be present nonetheless.

### **So where do we go from here?**

In a sense, this data forces us to entertain a limited number of options relative to how we perceive the stuttering phenomenon. We can continue to believe that stuttering is a speech disorder and subsequently ignore or disregard data to the contrary. It could also be opined that stuttered sign really is not stuttering at all, but another disorder stemming from a uniquely different core pathology. One could also suggest that stuttered sign is really just an extension (or subtype) of symptomology from the stuttered speech phenomenon and subsequently ignore or discredit accounts suggesting that stuttered sign occurs in some people that have only used signed communication as their primary communication modality. Finally--we could also begin to question the sanctity of stuttering as a speech disorder unto itself and accept the reality that stuttered sign may exist.

If we choose to entertain the notion that stuttering extends beyond the label of "speech disorder" and may exist in other modalities such as sign, then our traditional explanations of stuttering as a speech disorder fail to account for the phenomenon. Subsequently, it could be suggested that "stuttering" is a symptom or consequence, rather than the pathology unto itself. Much like dysphagia, which is symptomatic of limitations or malfunctions in the normal swallow process, the act of "stuttering" may be symptomatic of limitations or malfunctions in expressive communication, rather than speech alone.

***For those that wish to consider this alternative view of stuttering as symptomatic of limitations or malfunctions in expressive communication, please allow me to provide some food for thought:***

Simply stated, the rules and production for speech and sign are not the same. Signing is fundamentally different than spoken communication in that a completely different set of linguistic units are used. One could suggest that fundamental units of speech are sounds and syllables (Geffer, 1996); however, sign is a visual language that is not bound by the syllable, but rather by distinctive features such as: handshape, location, movement, palm orientation, and non-manual signs (Valli & Lucas, 1992; Stokoe, 1965). Subsequently, it should be no surprise that the characteristics of stuttered speech may not clearly translate into the characteristics of stuttered sign. Instead, the characteristics of the stuttering phenomenon will reflect the modality being expressed. If this latter point is reality, then stuttering secondary to expressive communication is likely to be largely unrecognized and subsequently under-diagnosed in non-oral modalities.

So after a bit of collaborative research, reflection, and discussion with GW, he submitted a list of eight potential characteristics of stuttered sign (Whitebread, 2004). These potential characteristics include:

1. Inconsistent interruptions in sign and finger-spelling.
2. Stuttered symptoms most often occur at the initiation of a gesture.
3. Hesitation of sign movement.
4. Repetition of sign movement while keeping the original handshape.
5. Exaggerated Signs / "Prolonged" Signs.
6. Unusual body movements completely unrelated to linguistic communication.
7. Poor fluidity of the sign.

8. Inappropriate muscular tension (in the arms and hands) associated with signing.

**Premise: Stuttering is not a speech disorder. As a matter of fact, it may not even be a disorder unto itself.**

It has been suggested that stuttering, in and of itself, is not a disorder (Conture, 1991; Garber & Siegel, 1982; Kalinowski, Dayalu, Stuart, Rastatter & Rami, 2000; Snyder, 2004). On the contrary, recent research is leading some to believe that stuttered speech is a symptomatic compensatory response to errors in speech related processing on the central (i.e., neural) level (Kalinowski et al., 2000; Snyder, 2004). If we are to believe that stuttered sign is reality, then it could be suggested that stuttering (in all its expressive modalities) may be a symptomatic compensatory response to processing errors at the central level. These processing errors may represent limitations or malfunctions in the formulation, processing, or execution of expressive output or communication. Stated differently, stuttering behaviors may represent a natural bodily response attempting to self-correct or bypass neural processing errors in expressive output or communication occurring at a central level.

**So what exactly is expressive communication?**

At the risk of sounding too esoteric, it seems a bit naïve to suggest that expressive communication is limited to that of speech and sign, while excluding other potential forms such as handwritten or musical expression. (*While the latter could be debated, a serving of Baker's bourbon and a John Coltrane track played on a hi-fi system begs to differ.*) In short, if we are to accept the notion that the stuttered response exists secondary to expressive communication, then it should be predicted that the stuttering phenomenon will occur in other expressive modalities.

And nature does not disappoint. The earliest account (that I have found) of such a phenomenon is in 1909, where the existence of "piano stuttering", "violin stuttering" and "penmanship stuttering" was documented (Scripture, 1909). Roman (1959) published an article suggesting a correlation between stuttered speech and stuttered handwriting, complete with graphological examples of the phenomenon. His research concluded that the stuttered handwriting phenomenon manifested itself as a: difficulty in initiating the motor act of writing, difficulty carrying out the writing action smoothly and precisely, and the difficulty maintaining unity within the written sequence. Likewise, Saltuklaroglu, Robbins, Kalinowski, Guntupalli & Nanjundeswaran (2005) report Normalized Jerk data from writing samples of stuttering and non-stuttering participant groups, which provides quantifiable data supporting the existence of stuttering in grapheme productions. If this conclusion reflects reality, then I predict that this stuttering phenomenon should also be demonstrated in typing as well.

Further, Silverman & Bohlman (1988) published an account of "flute stuttering", in which the performer reported difficulty in initiation relative to playing the flute. Similarly, Meltzer (1992) reported an occurrence of "horn stuttering", in which the performer reported "hesitant stumbling attacks robbing my performance of grace and ease." Moreover, I would like to report an account of "trumpet stuttering", where the performer reports, "As one who stuttered, and still does every now and then, I can tell you that it feels EXACTLY the same. In fact, it WAS stuttering." The performer went on to demonstrate a "trumpet stuttering" secondary behavior, avoidance, with his admission of, "I would always play slow and pretty pieces. And while people absolutely didn't know it--there was a reason why I played that particular musical style: my tongue couldn't handle the double or triple tonguing. I simply couldn't do it" (Snyder, 2006).

---

## **A new paradigm for the stuttering phenomenon?**

If the data presented in this manuscript does reflect reality, then we are forced to question the belief that stuttering is a speech disorder. On the contrary, the stuttering phenomenon appears to occur in a variety of expressive (communication) modalities. Further, if this suggestion is reality, then stuttering ceases to be a single (speech-related) pathology unto itself. Instead, it is suggested that the observable manifestations of stuttering behaviors are symptomatic responses relative to their corresponding expressive modality. These symptomatic behaviors may be in response to errors in the formulation, processing, and/or execution of expressive output, such as language; it is suggested that these symptomatic behaviors are natural compensatory responses at self correction from errors in processing or initiation at the central level.

In short, if the data and analysis presented in this manuscript do reflect reality, then the traditional views and definitions of stuttering as a speech disorder fail to account for the stuttering phenomenon. Consequently, researchers and clinical scientists may consider abandoning much of the prevailing paradigmatic (i.e., pre-paradigmatic) thought on stuttering, as it can no longer provide a truly scientific and falsifiable theoretical framework capable of accounting for the stuttering phenomenon. If stuttering behaviors are indeed symptomatic responses relative to errors in expressive output, including expressive communication, then a new paradigm will need to emerge to account for this new perceived reality.

## **References**

- Alm, P. (2005). *On the Causal Mechanisms of Stuttering*. (Doctoral dissertation, Lund University, Sweden, 2005).
- Backus, O. (1938). Incidence of stuttering among the deaf. *Annals of Otology, Rhinology and Laryngology*, 47, 632-635.
- Bloodstein, O. (1995). *A handbook on stuttering* (5th ed.). Chicago: The National Easter Seal Society.
- Conture, E.G. (1991). Young stutterers' speech production: A critical review. In H.F.M. Peters, W. Hulstijn, & C.W. Starkweather (Eds.), *Speech motor control and stuttering*. (pp. 365-384). New York: Elsevier.
- Conture, E.G. (2001). *Stuttering: Its Nature, Diagnosis and Treatment*. MA: Allyn & Bacon.
- Garber, S.R., & Siegel, G.M. (1982). Feedback and motor control in stuttering. In D.K. Rough (Ed.), *Learning, speech and the complex effects of punishment* (pp. 93-123). New York: Plenum Press.
- Geffer, M.P. (1996). *Survey of Communication Disorders: A social and behavioral perspective*. New York: McGraw-Hill.
- Guitar, B. (2006). *Stuttering: An Integrated Approach to Its Nature and Treatment* (3rd ed). MD: Lippincott Williams Wilkins.
- Harms, M.A., Malone, J.Y. (1939). The relationship of hearing acuity to stammering. *Journal of Speech Disorders*, 4, 363-370.
- Johnson, Wendell. (1950). Stuttering. In F.W. Price & C.P. Barry (Eds.), *Collier's Encyclopedia*. (Volume /s/, p. 258). New York: P.F. Collier and Sons Corporation
- Kalinowski, J., Dayalu, V., Stuart, A., Rastatter, M.P., & Rami, M.K. (2000). Stutter-free and stutter-filled speech signals and their role in stuttering amelioration for English speaking adults. *Neuroscience Letters*, 27, 115-118.
- Kalinowski, J., Saltuklaroglu, T. (2006). *Stuttering*. San Diego, CA: Plural Publishing.

- Kalinowski, J., Stuart, A., Rastatter, M., Snyder, G., Dayalu, V. (2000) Inducement of fluent speech in persons who stutter via visual choral speech. *Neuroscience Letters*, 281, 198-200.
- Kuhn, T.S. (1996). *The Structure of Scientific Revolutions* (3rd ed). Chicago: University of Chicago Press.
- Liles, B.Z., Lerman, J., Christensen, C., St. Ledger, J. (1992). A case description of verbal and signed disfluencies of a 10-year-old-boy who is retarded. *Language, Speech, and Hearing Services in the Schools*, 23, 107-112.
- Meltzer, A. (1992). Horn Stuttering. *Journal of Fluency Disorders*, 17, 257-264.
- Montgomery, B.M., Fitch, J.L. (1988). The prevalence of stuttering in the hearing-impaired school age population. *Journal of Speech and Hearing Disorders*, 53, 131-135.
- Roman, K.G. (1959) Handwriting and speech. *Logos*, 2, 29-39
- Saltuklaroglu, Robbins, Kalinowski, Guntupalli & Nanjundeswaran. (2005). Speaking While Producing Written Gestures Can Inhibit Stuttering. Paper presented at the American Speech-Language and Hearing Association National Convention, San Diego.
- Scripture, E.W. (1909). Penmanship stuttering. *Journal of the American Medical Association*, May, 1909.
- Sheehan, J. (1970). *Stuttering: Research and Therapy*. New York: Harper & Row.
- Shine, R. (1980). Direct management of the beginning stuturer. In W. Perkins (Ed.), *Seminars in speech, language, and hearing* (Vol. 1, pp. 339-350). New York: Thieme-Stratton.
- Silverman, F.H., Bohlman, P. (1988). Flute Stuttering. *Journal of Fluency Disorders*, 13, 427-428.
- Silverman, F.H., Silverman, E.M. (1971). Stutter-like behavior in the manual communication of the deaf. *Perceptual and Motor Skills*, 33, 45-46.
- Snyder, G. (2004). *Exploratory Research in the Role of Cognitive Initiation in the Enhanced Fluency Phenomenon*. (Doctoral dissertation, East Carolina University, 2004).
- Snyder, Robert (personal communication, September 7, 2006)
- Starkweather, C.W. (1982). Stuttering And laryngeal behavior: a review. *American Speech and Hearing Association Monograph*, 21.
- Starkweather, C.W. (1987). *Fluency and Stuttering*. New Jersey: Prentice-Hall, Inc.
- Stokoe W.C., Dorothy C.C., Carl G.C. (1965). *A Dictionary of American Sign Language on Linguistic Principles*. Washington, D.C.: Gallaudet College Press.
- Valli, C., Lucas, C. (1992). *Linguistics of American Sign Language*. Washington, D.C.: Gallaudet University Press.
- Van Riper, C. (1982). *The Nature of Stuttering* (2nd ed.). New Jersey: Prentice-Hall, Inc.
- Voelker, E.S., Voelker, C.H. (1937). Spasmophemia in dyslalia cophotica. *Annals of Otology, Rhinology and Laryngology*, 46, 740-743.
- Webster, R.L. (1977b). A few observations on the manipulation of speech response characteristics in stutterers. *Journal of Communication Disorders*, 10, 73-76.
- Whitebread, G. (2004). *Stuck on the Tip of My Thumb: Stuttering in American Sign Language*. (Honors thesis, Gallaudet University, 2004).
- Wingate, M.E. (1964). A standard definition of stuttering. *Journal of Speech and Hearing Disorders*, 29, 484-489.
-

- Wingate, M.E. (1970). Effect on stuttering of changes in audition. *Journal of Speech and Hearing Research*, 13, 861-873.
- Wu, J.C., Maguire, G., Riley, G., Fallon, J., LaCasse, L., Chin, S., Klein, E., Tang, C., Cadwell, S., Lottenberg, S. (1995). A positron emission tomography [18F]deoxyglucose study of developmental stuttering. *Neuroreport*, 6, 501-505.
- Wu, J.C., Maguire, G., Riley, G., Lee, A., Keator, D., Tang, C., Fallon, J., Najafi, A. (1997). Increased dopamine activity associated with stuttering. *Neuroreport*, 8, 767-772.
- Yairi, E. & Ambrose, N.G. (2005). *Early childhood stuttering: For clinicians by clinicians*. Austin, TX: Pro-Ed
-