

# The Domino Effect: The Implications of Pediatric Stuttering on the Development of Mental Health Disorders

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According to the American Speech-Language-Hearing Association (ASHA), stuttering generally originates during childhood. Most children who stutter begin doing so at approximately 2.5 years of age (Mansson, 2007; Yairi & Ambrose, 2005; Yaruss, LaSalle, & Conture, 1998). All speakers produce disfluencies, which may include whole-word repetitions or phrase revisions, but these these are generally considered to be non-stuttered, or typical, disfluencies (Ambrose & Yairi, 1999; Tumanova, Conture, Lambert, & Walden, 2014). Less typical disfluencies include part-word or sound/syllable repetitions, prolongations, and blocks (Yairi, 2007). Additionally, compared with typical disfluencies, stuttered disfluencies are usually accompanied by increased duration, effort, tension, or struggle during production. Some children endure a period of excessive disfluency that spontaneously recovers; however, there are children for whom stuttering does persist, and the effects of this particular communication disorder on their lives are significant. Thus far, research has not been performed to thoroughly explore the connection between pediatric stuttering and the development of mental health disorders, and this paper seeks to suggest a potential link between these factors and to propose such a study.

Limited research explores how emotional stress and children's emotional proclivity, more often referred to as "diathesis" in this context, affect stuttering. Conture and Walden (2012) have proposed a Dual Diathesis-Stressor (DD-S) model of childhood stuttering that attempts to explain if emotional diathesis interacts with emotional stress to affect childhood stuttering. This model suggests that variable emotional stressors, such as change or novelty in the child's environment, may activate a child who stutters' (CWS) generally stable emotional diathesis, which can result in high emotional reactivity. The activation of this type of diathesis is associated

with disruptions in fluent speech. This model, however, does not comprehensively explore how activation of emotional diathesis is associated with disruptions in fluent speech.

Choi et al. (2016) explored two issues pertaining to the emotional diathesis-stressor aspect of the DD-S explanation of childhood stuttering. The first issue that was examined was whether the CWS's emotional reactivity, emotional stress condition, and their subsequent interaction affect stuttering. The second issue that was explored was whether the potential associations between these factors could be mediated by sympathetic arousal. The researchers gathered 47 CWS between the ages of 36-71 months. Every participant was an otherwise typically developing, monolingual, native speaker of Standard American English, and had never received any reported formal treatment for stuttering or other communication disorders. A participant was considered a CWS if he or she exhibited at least three stuttered disfluencies out of a 300-word sample, and received an overall stuttering severity score of 11 or above on the Stuttering Severity Instrument-3.

Participants and their caregivers visited the Vanderbilt Developmental Stuttering Laboratory twice. During the initial visit, participants had their speech, language ability, hearing, and temperament evaluated. During the following visit, the sympathetic arousal levels and resulting speech disfluencies of each participant were measured through two tests. In the first test, each participant was seated directly in front of a computer monitor and was exposed to one baseline emotional stress condition, and one positive and one negative emotional stress condition, which took the form of one emotionally neutral and two emotionally arousing video clips, respectively. During the second test, the participants completed a speaking task in which they were asked to produce three separate narratives centered around picture prompts that were

presented to them. Throughout the narrative creation process, each participant's speech disfluencies and information about his or her sympathetic arousal levels were collected (Choi et al., 2016).

The Choi et al. (2016) study resulted in three main findings regarding the previously mentioned issues pertaining to the emotional diathesis-stressor aspect of the DD-S explanation of childhood stuttering. The first finding was that a CWS's positive emotional reactivity was positively associated with the amount of stuttered disfluencies they produced in response to a stimuli regardless of emotional stress condition. The next finding was that a CWS's negative emotional reactivity was more positively correlated with the percentage of stuttered disfluencies produced during the positive emotional stress condition compared with the baseline emotional stress condition. The third finding showed that the CWS's sympathetic arousal did not appear to mediate the effect of emotional reactivity, emotional stress condition, and their interaction on the percentage of stuttered disfluencies. These findings suggest an association between a CWS's positive emotional reactivity and stuttering, with negative reactivity seeming to be more strongly associated with the children's stuttering during positive emotional stress. In essence, the more positively or negatively emotionally reactive a child was to a particular stimulus, the more disfluencies they produced as a result.

While researchers have identified the cause-and-effect relationship between emotional reactivity and increased disfluency, the general public often has misconceptions about the causes of the disorder. Consequently, people who stutter are seen as anxious, shy, nervous, unintelligent, and incompetent (Woods & Williams, 1976). Extensive research documents negative attitudes toward stuttering, but when and how these attitudes develop is unclear. In a

non-experimental comparative study, Weidner, St. Louis, et al. (2017) examined United States and Turkish preschoolers in order to explore the origin of stuttering attitudes cross-culturally. These countries were of particular interest to the researchers due to the distinct cultural differences between them. The authors compared stuttering attitudes of 28 U.S. and 31 Turkish non-stuttering preschoolers on English and Turkish versions of experimental prototypes of the newly developed *Public Opinion Survey on Human Attributes–Stuttering/Child (POSHA–S/Child)*. Stuttering attitudes include how people think and feel about stuttering and people who stutter, as well as what they indicate their actions would be towards people who stutter.

The *POSHA–S/Child* begins with a preliminary section completed by a parent, requesting information about the child’s educational history, health, and abilities. Parents also reported their child’s personal experience with and exposure to people who stutter, are obese, or ambulate in a wheelchair. This information was combined into an experience score for each of the three categories, the results of which provided a perspective for better understanding the attitudes of children who do not stutter toward children who do stutter in the broader context of other human conditions (St. Louis, 2011).

The remainder of the *POSHA–S/Child* was administered orally to the child separate from his or her parents. It began with a video played on a tablet featuring two culturally neutral stuttering avatars, one girl and one boy, whose mouths moved as they talked. The characters’ speech consisted of obvious prolongations, blocks and initial sound and syllable repetitions, which were judged by two stuttering experts as being severe. Following the video, the

administrator verbally asked a series of “yes” and “no” questions relating to the child’s beliefs about and reactions towards children who stutter.

The final section examined the children’s reaction to stuttering as compared to being obese or in a wheelchair. The children were shown a line drawing of the avatar of the stuttering child featured in the stimulus video and line drawings of similar avatars depicting a child who is obese or a child that is in a wheelchair. The drawings were presented in pairs and the children were asked which avatar they would prefer to be (Weidner & St. Louis, 2017).

The results of the data collection and analysis for these three sections by Weidner, St. Louis, et al. (2017) showed that the attitudes of the U.S. and Turkish children were remarkably similar. The participants rated most of the items negatively, but also rated some items as neutral or positive. They held more negative attitudes towards traits and personalities of children who stutter, yet relatively more positive attitudes towards the potential of children who stutter. This study does not offer a definitive answer as to why attitudes towards stuttering of children from culturally diverse samples were remarkably similar; however, the authors speculate that level of cognitive development and experience with stuttering are the most likely factors. Killen and Rutland (2011) asserted that young children’s bias towards others relies on their cognitive ability to categorize people into certain groups, which then allows them to generate impressions of people who have attributes unlike their own. One example of this in the current study was the children's tendency to classify children who stutter as being different.

The question then arises, would non-stuttering children’s negative perceptions of stuttering be likely to result in undesired or negative social consequences toward children who stutter? In approaching this issue, Weidner, St. Louis, et al. (2017) differentiated between the

children's reports of how they would respond to stuttering events and the reports of how they would engage with children who stutter in social interactions. The children had little knowledge of how to respond appropriately to children's stuttering behavior. They said that they would finish the words of a child who is stuttering and say "slow down." Regarding social interactions, which include how the children would engage with the person who stutters, rather than their response to the stuttering itself, Weidner, St. Louis, et al. (2017)'s study did not provide strong suggestive evidence of the social exclusion of children who stutter. The non-stuttering children in both countries indicated that children who stutter are fun to play with, can make friends, and can do the same things as their peers. Both U.S. and Turkish children indicated that they would not laugh at their stuttering peers and would be patient with them. Weidner, St. Louis, et al. (2015) had identified this phenomenon in preschool and kindergarten children, claiming that their attitudes towards stuttering are more negative than their attitudes towards the children who stutter.

Weidner, St. Louis, et al. (2017) acknowledge that there may be discordance with preschoolers' responses to an avatar-based stuttering encounter versus one that occurs in reality. Langevin et al. (2009) had examined the actual reactions of typically fluent preschoolers towards their peers who stutter. Their study showed that children who stutter experienced negative social consequences as a result of their stuttering. Other research suggests that these attitudes may eventually evolve into overt, negative social behaviors on the part of the non-stuttering children during the school-age years and adolescence (Blood & Blood, 2004; Davis et al., 2002; Hartford & Leahy, 2007; Langevin et al., 1998; Mooney & Smith, 1995). Children who stutter from the United States, Canada, Ireland and England have been shown to be at a risk for teasing and

bullying (Blood & Blood, 2004; Langevin 2015; Langevin, Bortnick, Hammer & Wiebe, 1998; Mooney & Smith, 1995; Yaruss, Murphy, Quesal & Reardon, 2004) and social exclusion (Davis, Howell & Cooke, 2002; Gertner & Rice, 1994; Hartford & Leahy, 2007).

Some studies suggest that fluent children may favor other non-stuttering children because they fall into the same fluency group. Griffin and Leahy (2007) conducted a study in which they measured the attitudes towards stuttering of 3-to 5-year-old non-stuttering children. Results showed that 78% of the children noticed the stutter and reported that disfluent speech was not the norm. To a statistically significant level, children perceived a non-stuttering speaker more favorably than a stuttering speaker. In a related study, Hartford and Leahy (2007) showed that 81% of non-stuttering adolescents reported preference for a fluent friend as opposed to a friend who stutters. Langevin et al. (2009) reported that preschool-aged children who stutter are at risk for being viewed unfavorably by their fluent peers. Thus, children who stutter may be at a disadvantage for experiencing typical, casual communication opportunities with peers. Although the experiences among children who stutter are highly variable, it is clear that negative attitudes among non-stuttering peers have the potential to disrupt the social-emotional growth and development of children who stutter (Weidner & St. Louis, 2017).

The disruption of the social-emotional development of a child can result in social phobias and anxiety (Cunningham, McHolm, Boyle, 2006). According to Iverach, Jones, et al. (2016), anxiety is one of the most frequently observed and extensively studied consequences of stuttering. The association between stuttering and anxiety is unsurprising when considering the significant role that speech plays in daily functioning and social wellbeing. In particular, children who stutter may experience heightened social anxiety (Iverach, Jones, McLellan, Lyneham,



Menzies, Onslow, Rapee, 2016). The American Psychiatric Association (2013) defines social anxiety as “a chronic and debilitating anxiety disorder characterized by intense fear of social or performance-based situations where evaluation by others is possible.” Individuals with social anxiety disorder typically report an intense fear of negative assessment by others, and experience significant distress across a large range of social situations.

Iverach, Jones, et al. (2016) report that current studies that have investigated the presence of anxiety in children who stutter have yielded equivocal findings. A small number of these studies have even reported significantly higher anxiety symptoms in children or adolescents who stutter as compared to controls. Although there is growing evidence of a heightened rate of social anxiety disorder among adolescents and adults who stutter, previous studies have not comprehensively evaluated the presence of anxiety disorders among a large sample of children who stutter using a structured diagnostic interview. Therefore, the purpose of the Iverach, Jones, et al. (2016) study was to examine the relationship between stuttering and anxiety in a large sample of children who stutter. The goals of the research were to determine the rate of anxiety disorders among children who stutter as compared to a control group of children from the general community who do not stutter; and assess symptoms of anxiety, mood, emotional and behavioral problems, and experiences of bullying, both for the children who stutter and for the children in the control group, based on parent and child report.

The Iverach, Jones, et al. (2016) study took place in Australia and participants were children who stutter, and non-stuttering control children. Children were eligible for inclusion in the study if they were between 7–12 years of age, and had functional written and spoken English. Participants were drawn from private and public speech pathology clinics, and from the general

community through advertisements in major newspapers, television news, social media, school newsletters, and through word-of-mouth. There were 75 children in the group of children who stutter. The mean age of stuttering onset was 3.6 years, and in the majority of cases, it was reported that stuttering onset occurred slowly over several weeks or months rather than unexpectedly over a few days. Additionally, there was a reported family history of stuttering present. Eighty percent of the children were currently seeing a speech-language pathologist for stuttering treatment, and the majority had sought previous treatment for stuttering. Stuttering severity was rated by each child and parent together as either mild, moderate, or severe. Based on parent-child report, mean typical stuttering severity was 3.2 and mean worst stuttering severity was 4.6, rated on a scale from 0 (“No stuttering”) to 9 (“Extremely severe stuttering”). Two non-stuttering control children were matched to each child in the group of children who stutter, resulting in a control sample of 150 children.

Parents and children who met the eligibility requirements for the Iverach, Jones, et al. (2016) study completed an online survey which included: demographic questions for the parent, stuttering-related questions for children and parents from the group of the children who stutter only, an online child anxiety diagnostic assessment completed by the parents, child report symptom measures of anxiety, mood, behavioral and emotional problems, and experiences of bullying, and parent-report symptom measures of child anxiety, and behavioral and emotional problems.

Parents of children in the group of children who stutter were asked to supply comprehensive information about their child’s stuttering, including onset, severity, past or current speech treatment, as well as family history. Children in this group were asked to work

together with their caregiver to rate their typical and worst stuttering severity across eight speaking situations, on a scale ranging from 0 (“no stuttering”) to 9 (“extremely severe stuttering”); and current speech satisfaction, rated on a scale ranging from 1 (“extremely unhappy/unsatisfied”) to 9 (“extremely happy/satisfied”).

The child anxiety diagnostic assessment that was completed by the parents is the Youth Online Diagnostic Assessment (YODA). According to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, the YODA was developed at the Centre for Emotional Health at Macquarie University in Australia to evaluate and diagnose anxiety disorders in children and youths aged 5–17 years (DSM-IV; American Psychiatric Association, 2000). The assessment evaluates the existence of the main anxiety disorders, which includes social anxiety disorder, and common specific phobias that reflect the DSM-IV subtypes. The YODA asks the parent to rate the frequency of specific symptoms characteristic of a given disorder that are presented by their child; rate the extent to which these symptoms interfere with their child’s functioning; and respond to short open-ended written responses describing specific examples of the child’s problem and its interference.

Participants in the Iverach, Jones, et al. (2016) study also completed the Spence Children’s Anxiety Scale (SCAS). The SCAS assesses the severity of anxiety symptoms in children, and is completed by both the child and the child’s primary caregiver. The scale evaluates six domains of anxiety in line with DSM-IV anxiety disorder dimensions, including generalized anxiety and social phobia, among other disorders.

The online survey also included the Strengths and Difficulties Questionnaire (SDQ). The SDQ is a short behavioral screening assessment that is designed to evaluate emotional and

behavioral difficulties in children. Parents were presented with 25 attributes and asked to rate how applicable these characteristics are to their child, using a scale ranging from 1 (“not true”) to 3 (“certainly true”). The attributes fall under five scales: emotional symptoms, conduct issues, hyperactivity/inattention, peer relationship problems, and pro-social behavior. Following the rating of each of the attributes, all of the scales, excluding the prosocial behavior scale, are combined to create a Total Difficulties score. Next, the Internalizing score is obtained by combining the emotional and peer problems scales. This score evaluates problems directed towards or within the self, for example: internalized negative emotions. Finally, the Externalizing score is derived from the sum of the conduct problems and hyperactivity/inattention scales. This score assesses problems directed towards the external environment, for instance: conflicts with other individuals.

Next, children were asked to complete the Short Mood and Feelings Questionnaire (SMFQ). The SMFQ is a brief screening tool created to examine symptoms characteristic of depression in children. It is composed of 13 items that refer to cognitive and affective symptoms that the child may have experienced in the previous two weeks. Children were asked to rate the presence of these symptoms on a scale ranging from 0 (“Not True”) to 2 (“True”).

The online survey conducted by Iverach, Jones, et al. (2016) concluded with the completion of the Personal Experiences Checklist (PECK). The PECK assesses children’s and young people’s experiences of being bullied. The PECK is a combination of 32 items that cover a large range of bullying behaviors. The behaviors fall under four scales: relational-verbal bullying, cyber bullying, physical bullying, and bullying based on culture. The children were asked to rate the frequency by which they experience the bullying behaviors on a scale ranging

from 0 (“never”) to 4 (“every day”). A total score was derived by adding the responses to all 32 items. Higher scores indicated a greater frequency of being bullied.

A clinical psychologist who is trained in the diagnostic criteria and experienced in the evaluation and treatment of child anxiety reviewed the open-ended responses for each participant and the computer-scored diagnostic decision to determine the results for each diagnostic category. In order to most accurately determine whether there is an increased presence of anxiety disorders among children who stutter, the clinical psychologist was blinded to whether the child was from the group of children who stutter or the control group.

The results of Iverach, Jones, et al. (2016)’s research showed that the prevalence of any anxiety disorder was significantly higher for children who stutter than for non-stuttering children in the control group. In particular, the prevalence of social anxiety disorder was significantly higher for children who stutter when compared to non-stuttering controls. Although prevalence rates for all other clinical anxiety disorders, including separation anxiety disorder, generalized anxiety disorder, and obsessive compulsive disorder were not found to be remarkably higher in the group of children who stutter when compared with prevalence rates for non-stuttering controls, the prevalence of subclinical generalized anxiety disorder was notably higher for children who stutter than for non-stuttering controls.

With regard to the specific surveys, all mean SCAS scores fell within normal limits. However, SCAS Total scores based on the child and parent reports were significantly higher for children who stutter than for children in the control group who do not stutter. In particular, mean scores for the Social Phobia, Separation Anxiety and Generalized Anxiety subscales were markedly higher for children who stutter than for non-stuttering controls. Despite discrepancies

in scores between the parent and child reports, significantly higher SCAS scores were still recorded for the group of children who stutter when compared to controls.

All mean scores recorded for the SDQ, SMFQ, and PECK fell within normal limits. However, the mean SDQ Total Difficulties score and Internalizing and Externalizing scores were decidedly higher for the group of children who stutter than for non-stuttering controls. The SDQ Hyperactivity/Inattention score from the Externalizing score and the SDQ Emotional Problems score from the Internalizing score were both distinctly higher for children who stutter than for the controls. Additionally, the mean PECK Culture Bullying score was significantly higher for children who stutter than for non-stuttering controls.

Iverach, Jones, et al. (2016)'s research finding that the rate of any anxiety disorder among children who stutter was remarkably higher than for non-stuttering controls indicates the possibility for children who stutter to experience debilitating anxiety. The high rate of anxiety disorders among children who stutter was largely a function of the prevalence of social anxiety disorder. Participants in the group of children who stutter showed six times the odds of having a social anxiety disorder than participants in the control group who do not stutter. The prevalence of social anxiety disorder for children who stutter in this study is significantly higher than the prevalence rates that have been reported in large mental health studies of the general population (Iverach, Jones, McLellan, Lyneham, Menzies, Onslow, Rapee, 2016). Overall, the responses of the children and their parents on the symptom measures show that the children who stutter that participated in the present study were marked by significantly higher social anxiety, total anxiety, and internalizing and externalizing problems, than controls. These findings substantiate that social anxiety is the primary concern for children who stutter.

A number of authors have suggested that a subtype of social phobia or a social anxiety disorder is selective mutism (Black & Uhde, 1995; Anstendig, 1999). Selective mutism is defined by the American Speech-Language-Hearing Association (ASHA) as a childhood anxiety disorder marked by an individual's inability to speak and communicate successfully in particular social settings, such as school. Children with this disorder select the situations and people with whom they verbally communicate, and will sometimes choose to communicate through non-spoken means.

Selective mutism is assigned to the category of anxiety disorders in DSM-5, however, unlike all other anxiety disorders, the particular fears that underlie the condition are not specified. Vogel, Gensthaler, et al. (2019) explain that this leaves the cause of selective mutism symptomatology open. Although the causes of selective mutism remain unspecified, conclusions about potential fears in selective mutism can be drawn by past research. To begin with, social anxiety is known to be a central element of selective mutism. Children with social anxiety usually have a fear of being evaluated by others in social situations and the fear becomes prominent if the child perceives a strong likelihood of being scrutinized and if there is an expectation that the consequences of social evaluation will be substantial. Social anxiety can be broken down into three divisions of fear, which are performance, interaction and observation. The fear of performance includes the fear to perform in front of others, for example, giving a speech, the fear of interaction includes the fear to interact with other people, such as strangers, and the fear of observation includes the fear of getting observed by others, for instance while writing (Vogel, Gensthaler, Stahl, Schwenck, 2019).

Vogel, Gensthaler, et al. (2019) continue that past research also indicates fears beyond social anxiety. A number of studies have shown that a sizable proportion of children with selective mutism are characterized by speech or language impairments. There are indications that the sound of the voice of a child with selective mutism is a cause of fear for that child. More potential fears of selective mutism can be derived from case studies. These studies mention the fear of saying something wrong and the fear of performing imperfectly.

Although indirect conclusions about possible fears can be drawn from past research on selective mutism, the relevance of specific fears as well as how frequently they occur is still unknown. Additionally, according to Vogel, Gensthaler, et al. (2019), no study has yet directly addressed the content of fears or fear-related cognitions in children and adolescents with selective mutism. The purpose of Vogel, Gensthaler, et al.'s 2019 study was to examine fear content as well as fear-related cognitions that are involved in the failure to speak during social situations in children and adolescents with selective mutism.

One hundred and twenty-four children and adolescents between the ages of eight and 18 participated in the study. Sixty-five out of the 124 participants exceeded the cut-off value for selective mutism of the diagnostic scale of the Frankfurt Scale of Selective Mutism (FSSM), a parent-reported questionnaire. These sixty-five participants answered an open-ended question concerning fears. In order to illustrate the concept of fear the open-ended question was preceded by a brief description about a child with a fear of heights. Following the brief description of the child who has a fear of heights, participants were asked to describe the content of fears that exist in situations in which they fail to speak. The children and adolescents were given the freedom to report as many fears as they felt were significant.



Vogel, Gensthaler, et al. (2019) also presented participants with 35 items concerning possible fear-related cognitions that may play a role in the child's failure to speak. The items mainly related to various aspects of social anxiety. Fears connected to social anxiety that were addressed included: fear of interaction, which causes the child to remain silent because the way in which the conversation will evolve is unknown to the child; fear of performance, which causes the child to not speak because he or she is afraid that others will think the child is unable to assert themselves; fear of observational situations, due to which the child remains silent because he or she is afraid that others might observe them; and fear of displaying anxiety symptoms to others, which causes a child to remain silent because the child is hyperfocused on how internally tense he or she is. In addition to these cognitions are the cognitions of speech/language and voice. With regard to speech/language, the child does not speak because he or she believes that they are incapable of adequately formulating what they want to say, while regarding voice, the child does not speak because he or she thinks their voice sounds funny.

The number of reported fears varied widely among children and adolescents within the sample in response to the open-ended question. Vogel, Gensthaler, et al. (2019) analyzed the answers and divided the fears into eight different categories. Five of the categories, which were fear of negative reaction, fear of social evaluation, observational fears, interactional fears, and fear of showing anxiety symptoms, were categorized under the umbrella category of "social fears". Answers that were assigned to the subcategory of *fear of negative reaction* mostly concern the fear that others might laugh at them. Answers in the subcategory of *fear of social evaluation* contain fears that others might form a negative opinion of them and think badly about what they have said. *Interactional fears* concern fears related to partaking in a conversation,

meeting unknown people, or being in contact with a person of authority. *Observational fears* comprise fears of getting attention from people in the vicinity when the child speaks. And *fear of showing anxiety symptoms* was always reported with a description of bodily anxiety symptoms, such as it feels like others can see the beat of the child's heart as he or she speaks. At least one social fear was present in 67% of participants. The sixth category of fears, *fear of mistakes*, involves fears of giving an answer that may be incorrect, doing the wrong thing, or straying from expectations that others have of them. This category of fears was present in 40% of participants. The seventh category, present in 12% of participants, was classified as *language-related fears*, and contains fears that concern poor articulation and language production. The eighth category of fears is *voice-related fears* and comprises fears that are related to the sound of the individual's voice. The 7% of children who reported an answer in this category believed that their voice sounded funny or odd.

Results demonstrate that social anxiety and social fears are at least one, and perhaps the most important, aspect of selective mutism (Vogel, Gensthaler, Stahl, Schwenck, 2019). The fear concerning negative reactions of others in social situations was particularly highly reported and indicates that many children with selective mutism may fear the reaction of others and remain silent as a result. Additionally, the fear of mistakes was reported by a strikingly high proportion of children and adolescents with selective mutism in the Vogel, Gensthaler, et al. (2019) study. Findings also indicate the importance of the associated psychological construct of *perfectionism*, a tendency to set unattainably high standards and to be overly critical of one's own mistakes, in selective mutism.

Additionally, the literature on this topic indicates that language- and voice-related fears could exist in a group of affected children. Previous studies propose that language deficits have the potential to lead to fears concerning flawed speech in social situations. This reasoning is built on findings that showed that early language impairment in children increases the probability that those children will develop an anxiety disorder (Vogel, Gensthaler, Stahl, Schwenck, 2019). Bearing this research in mind, Vogel, Gensthaler, et al. (2019)'s findings correlate with studies that display that clinically relevant communication disorder is present in some of the children with selective mutism. Thus, in a small particular group of children with selective mutism, the existence of language impairments could lead to fears regarding language.

Previous controlled comparisons have suggested that oppositional behavior is common among children with selective mutism. Cunningham and McHolm et al. (2006) were interested in discovering the depth of the association between selective mutism and anxious or oppositional behavior. The authors collected a sample of 104 children, 52 with selective mutism and 52 community controls for this study. During a home visit for both the control and selective mutism groups, parents completed questionnaires and were given a structured interview (Boyle et al., 1999), while children completed brief reading and arithmetic tests. A parallel set of questionnaires was mailed to teachers (Boyle et al., 1993; Boyle et al., 1999). The results of the data collection and analysis showed that parents and teachers agreed that children with selective mutism were more anxious than controls. These findings are consistent with previous descriptive (Black & Uhde, 1995; Dummit et al., 1997; Steinhausen & Juzi, 1996) and controlled studies (Bergman et al., 2002; Kristensen, 2001). In addition, parents reported more obsessive-compulsive symptoms and more frequent somatic complaints among children with

selective mutism, which is consistent with previous studies that have also found obsessive-compulsive disorder symptoms and somatic complaints to be more common in children with selective mutism than in controls (Kristensen, 2001).

In another study that compared social phobia, anxiety, oppositional behavior, social skills, and self-concept in groups of children with specific mutism or generalized selective mutism, Cunningham & McHolm et al. (2006) were interested in understanding whether children with generalized selective mutism show more social skills deficits than those with specific mutism or controls. Participants included 28 children with specific mutism, 30 children with generalized mutism, and 52 community controls. Parents completed written surveys and responded to a structured home-based interview; children completed a self-concept measure that did not require verbal responses, and teachers responded to parallel questionnaires. Parents and teachers rated children in both the specific and generalized selective mutism subgroups to be less socially competent than controls. Social skills deficits were also apparent in situations that did not require speaking. Parents found that children with selective mutism were less confident socially, had difficulty making friends, and were less likely to join groups. Limited interaction with peers and fewer opportunities to observe and rehearse the complex relational skills that emerge during this period of development may be contributing factors in the generalized social skills deficits that parents and teachers reported.

While children with selective mutism are dealing with emotional and behavioral issues, according to Kutash & Duchnowski et al. (2015), many children who experience similar emotional and behavioral concerns are not considered to be in severe enough situations to qualify for a diagnosis. A lack of proper diagnosis is alarming, though, as these concerns can negatively

impact the quality of life of and place them at risk for developing a mental health disorder in the future. Since the passage of the Individuals with Disabilities Education Act (IDEA), the field has been working to find a solution as to how to best integrate necessary mental health services into the education program of children (Forness et al., 2012); however, many institutions still view student's mental health needs as off-task behavior and the responsibilities of other agencies.

Although the experiences among children who stutter are highly variable, it is clear that pediatric stuttering and the resulting negative attitudes among non-stuttering peers have the potential to disrupt the social-emotional growth and development of children who stutter. Given that the behaviors of non-stuttering peers which have the ability to disrupt the social-emotional growth and development of children who stutter may begin as early as preschool, it is important to further substantiate the preliminary research performed on young typical children's attitudes towards stuttering. Doing so will provide speech-language pathologists, teachers, and parents with the information to understand the social challenges faced by children who stutter, and enable them to promote positive social interactions between children who do and do not stutter (Weidner, St. Louis, et al., 2017). If parents and professionals do not attempt to understand the challenges faced by children who stutter or take appropriate measures to foster an environment in which these children will feel comfortable, then there is strong potential for the development of selective mutism and mental health disorders. Mental health problems increase the likelihood of academic underachievement, negatively impact the quality of a child's life (Rothi & Leavey, 2006), and have lifelong effects that include psychosocial economic costs for that child, and their families, schools, and communities. Even mild mental health problems can threaten overall

health and quality of life and make it more difficult for children to succeed in school, at work, and in social situations (Miles, Espiritu, Horen, Sebian, & Waetzig, 2010).

Further research needs to be performed in order to corroborate a potential link between pediatric stuttering and the development of selective mutism and other mental health disorders, and should be done so imminently. If we can understand the far-reaching and lifelong effects of stuttering, then we can effect earlier and better change.

The aim of the following proposed longitudinal and prospective study is to explore the connection between pediatric stuttering and the development of selective mutism and other mental health disorders and to discover if there is, in fact, the possibility that a domino effect can occur. Previous research indicates that links exist between stuttering, anxiety, selective mutism, and mental health disorders, but in order to confirm that all of these individual components can exist as a cascade from stuttering to the development of mental health disorders, a study must be conducted. It is hypothesized that children in the study who stutter will later present with at least one mental health disorder.

Participants will include children who stutter, as well as children who do not stutter who will act as a control group. In order to be eligible for inclusion in the study the children in either group will have to be between 5-7 years of age, be enrolled in a public or private school, and have functional written and spoken English. Non-stuttering control children will be included when there is no evidence of stuttering based on a parent report and a speech-language screening by a speech-language pathologist. Children in the stuttering group will have to have developed their stutter before the age of five and have a presence of stuttering that is confirmed by two independent speech-language pathologists.

In order to confirm a diagnosis of stuttering for children in the stuttering group, parents will be asked to provide researchers with a 10-minute recording of their child speaking at home, which will be evaluated by two independent speech-language pathologists. A diagnosis of stuttering will be made if univocal stuttering is present within the 10-minute speech recording. Once it is apparent to the speech-language pathologists that the child stutters, there is no minimum count for the amount of disfluencies the child will have to produce in order to be classified as having a stutter.

The goal is to recruit a total of 80 children from around the United States to participate in the study. Ten students who stutter and 10 control subjects will be gathered from each of the following areas: the Northeast, the Midwest, the South, and the West. The reason for doing so is to monitor the role that the behavior of peers toward a child who stutters plays in the social-emotional development of that child. Although Langevin et al. (2009) have reported that stuttering has the potential to elicit negative peer responses and affect other social interactions, the authors studied a very small group of children in only one city in Australia, and it would be interesting to discover if the findings are the same for a larger group of participants across the United States.

Additionally, since the negative attitudes of non-stuttering peers toward children who stutter has the potential to disrupt the social-emotional growth of children who stutter and can result in the development of social phobias and anxiety, it is important to understand if the behavior of non-stuttering children toward children who stutter is the same or variable among the different parts of the country. Albeit stereotypical, it is commonly thought that different populations of people around the United States are kinder and more inclusive than others. For

example, people in the South are often believed to be friendlier than their counterparts in the Northeast. A possible finding might be that the difference in culture around the country can result in more positive or negative reactions from non-stuttering peers toward peers who stutter. This is significant because it could indicate that children who stutter and are at a higher risk of developing anxiety and mental health disorders due to overwhelmingly more negative reactions from peers who do not stutter live in concentrated areas of the United States. These parts of the country, and the children who stutter who live in these areas, could be more closely monitored by speech-language pathologists and mental health professionals who can then provide appropriate intervention in order to prevent the cascade.

Once the participants in both groups have been selected, the children and their parents will be required to complete individual questionnaires regarding behavior and social interaction with peers. Parents will be asked to provide details about their child's usual demeanor, attitude toward school, attitude toward peers, and the amount of social interaction that the child has with his or her peers outside of the classroom. The children who stutter and children in the control group will be asked to share details about how often they verbally interact with peers inside the classroom, how their peers behave toward them during these interactions, and their emotions regarding initiating a conversation with their peers or speaking during class when called on by their teacher. In addition to completing the questionnaire, the children who stutter will meet individually with a speech-language pathologist who will evaluate their speech and language abilities, and all children in the stuttering and control groups will meet privately with a mental health professional who will evaluate their emotional state.



The children in the stuttering and control groups will be followed from that point on through the age of 30 years. Each child will be reevaluated every six months until he or she reaches 14 years of age or the end of his or her elementary school education. At each evaluation the children and their parents will be instructed to fill out the same questionnaire that they completed at the point of intake. The children who stutter will be evaluated by a speech-language pathologist, and all participants will be assessed by a mental health professional, at each of these bi-annual reviews.

After the children turn 14 years old or complete their elementary school education, they will be monitored once a year until they complete their secondary school education, whether that be high school or university. The same questionnaire will be administered annually to the participants only—not to their parents—until the participants complete their secondary education. During this period there will be an additional section added to the questionnaire which will ask the participants to share if they ever feel anxious during interactions with peers, if they ever feel unable to speak or choose to remain silent in particular social settings, and if they have ever sought out the guidance of a mental health professional. The participants in the stuttering group will again be evaluated by a speech-language pathologist, while all participants will be assessed by a mental health professional.

Once the participants have completed high school or university they will continue to be monitored annually until they turn 30-years-old. During this period the participants will only be required to complete the final section of the questionnaire that asks about anxiety, inability to speak in social settings, and mental health services. They will continue to be evaluated by a speech-language pathologist and a mental health professional at these yearly follow-ups.

Although participants in the stuttering group may shed their stutter naturally over time or with the help of a speech-language pathologist, they will still be assessed by a speech-language pathologist at each of the bi-annual or annual reviews until they turn 30-years-old and conclude their participation in the study.

The answers given by participants to the questionnaires over the course of their development from early childhood through adulthood will be analyzed by speech-language pathologists and mental health professionals for information that gives insight into the social-and-language-oriented experiences of the participants. This data, as well as the evaluations made by speech-language pathologists and mental health professionals at the bi-annual and annual assessments, will create a picture of development over time for the stuttering and control groups. The development of the groups will be monitored for similarities and significant differences along the way. The information that is collected throughout the course of this study will allow speech-language pathologists, mental health professionals, and educators to better understand the experiences of children who stutter, as well as how these experiences may shape their later social-emotional maturation.

If the hypothesis, which states that children in the study who stutter will later present with at least one mental health disorder, is demonstrated by the results to be true, then a therapeutic approach is necessary. Children who stutter should be followed by mental health professionals to prevent the cascade from stuttering to the development of mental health disorders.

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