

EXPLORING THE RELATIONSHIP BETWEEN RESILIENCE
AND ADVERSE IMPACT OF STUTTERING

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ABSTRACT

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Children who stutter often experience adverse impact such as bullying, negative thought patterns, and reduced self-esteem that result from living with their condition. Research suggests that there are factors that may place a child who stutters at greater risk for adverse impact as well as protective factors that mitigate this risk. The aim of this study is to examine the relationship between resilience and stuttering's adverse impact in children. Resilience reflects both internal factors such as grit and the ability to cope and external factors such as family support and access to resources. We collected data from children who stutter and their parents to assess children's resilience and stuttering's adverse impact using standardized assessments. We then explored the relationship between resilience and adverse impact through descriptive statistics, linear regression, and correlation analyses. Results revealed that even children in the youngest, preschool-aged group showed adverse impact due to stuttering. We also found that greater resilience predicted less adverse impact in in school-aged and adolescent children who stutter. These findings provide insight into the experience of stuttering and offer support for treatments that incorporate resilience building into therapy to help mitigate adverse impact experienced by children who stutter.

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Introduction

Defining the term *stuttering* is complex, as it encompasses many factors. On a biological level, stuttering is a neurodevelopmental disorder arising from the atypical development and function of cortical areas involved in speech production and auditory and linguistic processing (American Psychiatric Association, 2013; Smith & Weber, 2016). This atypical development is believed to cause increased vulnerability to speech breakdowns when individuals face increased linguistic, cognitive, and emotional demands (Smith & Weber, 2016). The World Health Organization's International Classification of Functioning, Disability and Health (WHO-ICF) model of stuttering confirms that stuttering is more than simply its biological components (Yaruss & Quesal, 2004). The primary symptom identified in the WHO-ICF definition of stuttering developed by Tichenor and Yaruss (2019) is the sensation of being stuck, losing control, and feeling unable to continue speaking. With this sensation comes behavioral, affective, and cognitive reactions, resulting in speech disfluencies and avoidance behaviors; feelings of embarrassment, anxiety, fear, and shame; and low self-esteem, self-confidence, and self-acceptance (Tichenor & Yaruss, 2019; Yaruss & Quesal, 2004). Additionally, there are the external factors such as the negative reactions and attitudes of others to stuttering. These internal and external factors can cause individuals who stutter to experience limitations restricting their ability to form inter-relationships, participate in daily activities, and may adversely affect an individual's education and employment (Boyle et al., 2018; Jones et al., 2021; Tichenor & Yaruss, 2019).

Long before these adverse effects on employment, stuttering typically onsets between the ages of 2 and 6 years, most often around the age of three years, when children begin to form longer and more complex utterances (Jones et al., 2021; Yairi & Ambrose, 2005). The onset of

this stuttering may be gradual (over weeks) or sudden (over days), with the more common type of onset being sudden onset (Jones et al, 2021; Yairi & Ambrose, 2005). Many children who stutter recover naturally and do not end up requiring speech-language services. In these cases, recovery usually occurs within 18 to 24 months post-onset (Jones et al., 2021; Yairi & Ambrose, 2005). Approximately 80% of preschoolers who begin to stutter recover; for those who persist, stuttering often becomes a chronic speech disorder (Yairi & Ambrose, 2005).

Stuttering comprises both overt and covert characteristics. Overt characteristics are observable characteristics that others can either see or hear; these include repetitions of sounds, words, and/or phrases; prolongations of sounds; and blocks (Logan, 2015; Tichenor & Yaruss, 2019). On the other hand, covert characteristics of stuttering are those that may not be observable by others and make up the bulk of the effects stuttering has on people (Murphy et al., 2007). Covert symptoms include thoughts, feelings, or reactions to one's stuttering, sensing physical tension, awareness or anticipation of their stutter, avoidance of words or situations that may exacerbate stuttering, and other methods of averting detection of stuttering by their communication partners (Constantino et al., 2017; Logan, 2015; Tichenor & Yaruss, 2019). Although not easily observed by communication partners, these sub-surface issues may seriously affect people who stutter. The adverse impact caused by stuttering presents itself in terms of affective, behavioral, and cognitive reactions from speakers who stutter as well as the reactions of others (Plexico et al., 2019; Tichenor & Yaruss, 2019). These reactions may be feelings of embarrassment, fear, and anxiety; decreased self-esteem; and decreased self-acceptance, for example. There is much to learn about how adverse impact develops in children who stutter. A better understanding of both the factors that place children at greater risk for developing adverse impact and protective factors that mitigate this risk will ultimately help us better understand the

stuttering condition and in turn, help us better diagnose and treat adverse impact experienced by many children who stutter. In this study, we explored the relationship between resilience, a multidimensional construct that includes both internal attributes and access to resources, and stuttering's adverse impact.

Literature Review

Adverse Impact in Stuttering

For many, stuttering adversely affects more than just one's speech, including emotional, social, and mental health functioning (Craig et al., 2011). In addition, stuttering affects engagement in life opportunities, self-esteem, as well as the development of societal and self-stigma (Boyle, 2016; Boyle, 2018; Tichenor & Yaruss, 2019; Yaruss & Quesal, 2004). People who stutter may choose to avoid certain social interactions or opportunities to engage with others altogether, resulting in loneliness or feelings of isolation (Boyle et al., 2018; Jones et al., 2021). When people who stutter engage socially, they may experience adverse impact from the negative reactions of their communication partners, which may cause a cycle of avoidance. For example, the fear of being judged by listeners and observers can cause increased social anxiety and/or social phobia as well as avoidance of certain situations or people out of fear or embarrassment (Caughter & Dunsmuir, 2017; Craig et al., 2011). These participation limitations identified in the WHO-ICF for stuttering, whether due to avoidance or rejection, cause people who stutter to miss out on important opportunities and interactions that would better their quality of life and sense of fulfillment. We collectively refer to these limitations as "adverse impact" of stuttering. Research into adverse impact experienced by people who stutter has largely focused on adults and has been conducted using different approaches.

Adverse Impact in Adults Who Stutter

Many adults who stutter experience adverse impact from stuttering in a variety of ways. Examples of adverse impact due to stuttering include anxiety, stigma surrounding stuttering, reduced self-esteem and self-efficacy, and repetitive negative thinking (Beilby, 2014; Boyle, 2016; Tichenor & Yaruss, 2019; Tichenor & Yaruss, 2020). This adverse impact can be

measured in a variety of ways; one measure that was designed specifically to capture the adverse impact of stuttering is the Overall Assessment of the Speaker's Experience of Stuttering (OASES; Yaruss & Quesal, 2006, 2016). This tool evaluates stuttering on multiple levels including associated overt characteristics, communication difficulties regularly experienced, as well as the impact of stuttering on quality of life. Tichenor and Yaruss (2020) examined the relationship between stuttering's adverse impact, temperament, and repetitive negative thinking (RNT). RNT was measured with the Perseverative Thinking Questionnaire (PTQ; Ehring et al., 2011) and defined as pervasive, ruminating thought, whether consciously or subconsciously, about oneself in a negative light. Tichenor and Yaruss (2020) found that adults who engaged in RNT were more likely to report greater adverse impact assessed with the OASES. The relationship between these variables was moderated by participants' temperament.

Taking another approach to measuring adverse impact, Boyle (2016) studied the psychological wellbeing in adults, exploring its relationship to whether adults believed stuttering caused a significant impact on their lives. Specifically, they measured perceived self-stigma using the stigma application sub-section of the Self-Stigma of Stuttering Scale; anxiety using the Generalized Anxiety Disorder 7-item Scale; and self-esteem and self-efficacy using the self-esteem/self-efficacy sub-scale of the Empowerment Scale. For adults who stutter, those who believed stuttering negatively affected their lives had increased anxiety and lower self-esteem/self-efficacy. They additionally found that those who felt they had more control over their stuttering had increased self-esteem and self-efficacy and decreased self-stigma. To explore self-efficacy specifically, Craig et al. (2011) used the Lifestyle Appraisal Questionnaire (LAQ) which is a general measure of health risk and self-efficacy. Although previous measures looked at both self-esteem and self-efficacy and both concern beliefs about the self, they are distinct

concepts. Self-esteem encompasses what one feels about themselves in general and self-efficacy encompasses one's belief in their own ability to accomplish a goal or task (Boyle, 2013). With the LAQ, among others administered, Craig et al. (2011) found that adults who stutter experience lower self-efficacy and a reduced sense of control over their lives, demonstrating the adverse impact stuttering can have on one's life. Finally, Plexico et al. (2019) used the self-acceptance scale and satisfaction with life scale to measure general adverse impact in adults who stutter. They found that being a person who stutters was not significantly associated with self-acceptance in adults, however it was significantly associated poorer life satisfaction, meaning adults reported stuttering having a negative impact on their satisfaction with life.

Overall, these studies into stuttering's adverse impact provide a more holistic picture of what adults who stutter face in their daily lives, particularly covert factors. While listeners and observers can only see the surface level aspects of stuttering, many people who stutter experience difficulties that significantly impact their quality of life, their self-esteem, self-efficacy, and self-acceptance.

Adverse Impact in Children Who Stutter

A modest, yet growing literature reveals that children, like adults, face significant adverse impact related to stuttering. One common form of adverse impact for children who stutter is negative reactions from peers and increased risk of bullying (Caughter & Crofts, 2018; Caughter & Dunsmuir, 2017; Craig et al., 2011; Druker et al., 2019). Encountering negative reactions to their stuttering, especially from peers who they likely interact with daily, can be a damaging contribution to adverse impact, as they can spur social exclusion, and reduce the number of social interactions a child who stutters experiences (Caughter & Crofts, 2018). A reduced number of social interactions causes further isolation which can then result in more internal

adverse impact, such as reduced self-esteem and increased emotional reactivity (Caughter & Crofts, 2018; Druker et al., 2019).

Many children who stutter also experience covert forms of adverse impact such as having poorer attitude about their ability to communicate, fears, automatic thoughts, and assumptions of the outcomes of speaking (Caughter & Dunsmuir, 2017; Craig et al., 2011; Guttormsen et al., 2015). Automatic thoughts about speech may be related to apprehension or fear of speaking and assumptions of the outcomes of speaking may be anticipation that a communication partner will have a negative reaction to an individual stuttering (Caughter & Crofts, 2018). These negative outlooks can result in reduced optimism about their future in addition to reduced self-confidence (Caughter & Crofts, 2018). In addition to this type of negative thinking, many children who stutter experience psychological effects of their stuttering such as higher risk of anxiety disorders, specifically social anxiety (Caughter & Dunsmuir, 2017; Caughter & Crofts, 2018; Craig et al., 2011; Iverach et al., 2016). Social anxiety and negative automatic thoughts about communication result from negative social encounters and interactions, and only further the adverse impact of those events.

Although these studies reveal that children, like adults, experience significant adverse impact due to their stuttering, we know little of the factors that contribute to the development of adverse impact. Fewer studies have focused on children compared to adults. Extrapolating findings from studies with adults is problematic given that children who stutter are still undergoing growth and development; furthermore, the sources of adverse impact may be different in children than adults. Research exploring the factors that contribute to or buffer against adverse impact may provide targets for holistic therapy addressing both stuttering behaviors and adverse impact. For example, certain factors may place a child with

communication disorders at risk for experiencing adverse impact, such as inadequate social support and lower self-efficacy, while other factors may protect against the development of adverse impact, such as positive social functioning and the ability to cope (Craig et al., 2011; Plexico et al., 2019). The presence of risk or protective factors may account for why children experience more or less adverse impact. Preliminary evidence for this idea comes from a study by Lyons and Roulstone (2018) which included children with a variety of speech and language disorders. They reported findings from 11 children with data collected using narrative inquiry analysis. By analyzing the language and narrative structures participants used to get a sense of their overall emotional state and well-being, they identified factors affecting the amount of adverse impact a child experiences. Risk factors, those that lead to decreased well-being, included the communication difficulties experienced due to the speech or language disorder, difficulties with relationships, and concern about their academics. Protective factors, those that lead to increased well-being, included increased levels of hope, sense of control and independence in their lives, and the number of positive social relationships they had. While this study provides valuable information on the experiences of children with speech and language disorders, it included a small sample size and did not focus exclusively on children who stutter, making it difficult to determine whether these risk factors and protective factors may also be attributed to the condition of stuttering.

Resilience

A firmer understanding of what constitutes risk and protective factors associated with adverse impact in children who stutter can help us understand how adverse impact emerges in children who stutter and in turn, help inform treatment practices to address the negative consequences of stuttering. One critical factor that may help protect against adverse impact of

stuttering is resiliency, which has been examined in adults who stutter (Craig et al., 2011; Freud & Amir, 2020; Plexico et al., 2019). Although resilience is defined and measured in different ways, there is consensus in the broader literature that resilience captures how one uses internal and external resources to cope and adapt in the face of difficult experiences (Bonanno, 2004; Connor, 2006; Masten, 2001; Masten et al., 1990; O’Leary, 1998; Ungar, 2008). There is also general agreement that resilience is a dynamic and complex construct and not strictly a single characteristic or a personality trait (Connor, 2006; Connor & Davidson, 2003; Ungar, 2008). Research suggests that greater internal, personal qualities and strengths are important protective factors that allow someone to adapt, cope, and even thrive in presence of adversity (Connor, 2006; Connor & Davidson, 2003; O’Leary, 1998). For example, some studies with adults hypothesize that resilience encompasses an individual’s positive adaptation and coping mechanisms in the face of significant adversity, describing this as an individual’s ability to “bounce back” or recover from adversity and hardship (Connor, 2006; Ledesma, 2014). Researchers also focus on other internal attributes such as personality traits that may influence resiliency, including optimism and patience, and an individual’s ability to maintain general stability in the face of unstable environments and events (Bonanno, 2004; Connor, 2006). Internal attributes that allow for adaptation and coping with negative experiences clearly contribute to resilience, as they may promote a more positive outlook on challenges and help people from being held back by future setbacks. However, external factors can also play a significant role in determining resilience.

Some researchers theorize that both internal and external factors play a role in cultivating resilience. Masten (2001) examined resilience models and their implications in the lives of children more at risk to experience adverse life events in their developmental years and

concluded that resilience comprises inherent or internal resources as well as resources rooted in their families, relationships, and communities. Ungar (2008, 2011) also focuses on the aspect of resilience involving support from relationships and community, incorporating the concepts of navigation and negotiation. Navigation refers to the availability of help to an individual as well as their ability to find help, while negotiation includes resources being provided by one's community in meaningful ways to community members. Using these constructs, Ungar (2008) defines resilience as the following:

In the context of exposure to significant adversity, whether psychological, environmental, or both, resilience is both the capacity of individuals to navigate their way to health-sustaining resources, including opportunities to experience feelings of well-being, and a condition of the individual's family, community, and culture to provide these health resources and experiences in culturally meaningful ways. (p. 225)

This definition highlights that resilience encompasses an individual's ability and knowledge of how to find resources to support them as well as the availability of resources to support that individual. Jefferies et al. (2018) developed a measure that assesses resilience according to the framework used and described in the definition provided by Ungar (2008). The Child and Youth Resilience Measure (CYRM-R) is a self-report tool that assesses an individual's feelings about themselves as well as the degree of perceived support from their caregivers and their community (Jefferies et al., 2018). The CYRM-R measures resilience as the interaction of these internal and external factors in an individual.

Stuttering, Adverse Impact, and Resilience

Clearly, many adults and children who stutter experience adverse impact from stuttering. It is possible that protective factors such as resilience mitigate the amount of adverse impact a person experiences, yet only a few studies have examined the interrelationships between adverse

impact and protective factors, such as resilience. Moreover, the few studies examining resilience and adverse impact in stuttering have been conducted with adults rather than with children.

Studies With Adults Who Stutter

In a study with over 200 participants, Craig et al. (2011) explored factors hypothesized to protect adults who stutter from adverse impact. They hypothesized that adults with higher levels of resilience would also have higher levels of protective factors guarding them against adverse impact of stuttering. The researchers divided the participants into a “resilient” group and a “nonresilient” group based on participants’ responses to the Global Severity Index (GSI), a measure of overall severity of psychopathology. In addition to completing the GSI, participants completed various other measures to gauge which protective factors were present in their lives. These questionnaires were completed following a short three-minute discussion which was recorded to assess the frequency and severity of stuttering. Using a multivariate analysis of variance (MANOVA), they identified the differences in protective factors between the two groups, including self-efficacy, social functioning, and perceived social support among others, with a. The researchers specifically identified three concepts contributing to resilience which were individuals’ self-efficacy, the amount of social support received, and social functioning. Participants who were identified as resilient often reported these three factors and experienced less difficulties in relation to adversity, indicating the role resilience has in protecting against adverse impact in people who stutter. A relationship between resilience and adverse impact was observed, demonstrating resilience may act as a buffer against adverse impact.

Plexico et al. (2019) also reported result in support of resilience’s role in protecting against the negative effects associated with stuttering. They investigated how coping skills, as measured by the Brief Cope inventory, and resilience, as measured by the Connor-Davidson

Resilience Scale (CD-RISC), impact self-acceptance and satisfaction with life, as measured by the Self-Acceptance Scale and Satisfaction with Life Scale. They included 47 adults who stutter compared with 47 adults who do not stutter. Results indicated that increased resilience and coping were associated with higher levels of self-acceptance and satisfaction with life in both people who stutter and people who do not stutter. Although stuttering was not significantly associated with self-acceptance overall, there were associations between stuttering and lower self-acceptance in participants with lower levels of resilience. These results further suggest a relationship between higher resilience and less adverse impact in stuttering.

However, Freud and Amir (2020) highlight that these prior studies did not directly examine the relationship between resilience and stuttering, rather focused broadly on general life “difficulties” through measures such as the GSI. To address this gap in the literature, Freud and Amir used the OASES to assess adverse impact related to stuttering. They hypothesized that higher levels of resilience would be associated with lower levels of both stuttering frequency measured by the Stuttering Severity Instrument-4 (SSI-4; Riley, 2009) and the impact stuttering has on adults who stutter. Researchers found a strong negative correlation between resilience, as measured by the CD-RISC, and adverse impact, measured by the OASES meaning that participants reporting less adverse impact due to their stuttering were more likely to have higher resilience scores. However, they did not find a relationship between resilience and stuttering severity/frequency. This finding suggests that while resilience is not related to the external, observable effects of stuttering, higher levels of resilience are beneficial for mitigating negative internal, covert factors related to the stuttering experience.

Taken together, findings from Freud and Amir (2020), Craig et al. (2011) and Plexico et al. (2019) confirm that individuals who stutter who are less resilient report greater adverse

impact from stuttering and poor life satisfaction. It follows then that greater resilience may play a protective role against the development of this adverse impact.

Studies With Children Who Stutter

Although there have been just a few studies on resilience in children who stutter, these studies have focused largely on implementing strategies in therapy to enhance resilience to help children cope with the negative effects of stuttering. The idea that fostering resilience in children can help them overcome difficult situations related to stuttering is promising as a therapeutic approach. Unfortunately, there is little empirical data on the efficacy of such an approach, or at a fundamental level, on the relationship between stuttering and adverse impact in children.

Caughter and Crofts (2018) compiled a descriptive report, comprising several literature reviews, to explore the idea of promoting resilience in children who stutter. They reviewed literature pertaining to the clinical aspect of nurturing resilience in children using a framework drawn from the Reaching Out Resiliency Program (RIRO) and the Penn Resiliency Program (PRP) which suggest targeting specific characteristics linked to developing resiliency. They focused their discussion on school-aged children who stutter, and discussed targets such as emotional regulation, impulse control, empathy, and self-efficacy in terms of resilience development. Caughter and Crofts (2018) also expressed that resiliency skills can be learned, but must be deliberately encouraged by those around them, with parents having a key role. Furthermore, they suggested resilience may help children persevere despite adversity and view challenges more positively. These conclusions support the idea that building resilience in children who stutter may help them better cope with adverse effects of stuttering, however it is descriptive by nature and therefore does not provide novel empirical evidence as support.

Druker et al. (2019) conducted a study examining the effect of including a parent-led resilience component in early intervention stuttering therapy. They randomly divided 28 children who stutter evenly into two groups: one group received early intervention stuttering therapy combined with a parent-led resilience component and the other group received early intervention stuttering therapy alone. Resilience was measured using the Curtin Early Childhood Stuttering Resilience Scale (CECSRS) which is a resilience measure specifically designed for the preschool population. Results showed that the group receiving the parent-led resilience component in addition to stuttering therapy showed fewer behavioral and emotional problems and demonstrated greater resilience. These results suggest that targeting resilience in therapy approaches with parents and children may ultimately help children manage their emotions in adverse situations more effectively. However, because the researchers did not include a direct measure of the adverse impact of stuttering, it cannot be determined whether the adverse situations they studied were related to stuttering. While conclusions from the Druker et al. (2019) and the Caughter and Crofts (2018) research are promising, they were undertaken without a basic understanding of the relationship between adverse impact and resilience in children who stutter.

In the one preliminary study exploring changes in various communicative, emotional, and cognitive areas in children who stutter after an intensive therapy program, Caughter and Dunsmuir (2017) examined the relationship between resilience and stuttering's adverse impact. Seven children who stutter participated in the study, engaging in an intensive two-week therapy course which they attended daily with their parents, followed by four therapy groups which they attended over the next 12 months to measure the long-term effects of the therapy. Among other assessments, participants completed the OASES-S, to measure adverse impact, and the Resiliency Scale for Children and Adolescents (RSCA) questionnaire, as a measure of resilience,

multiple times throughout treatment. The RSCA consists of 64 items separated into three sections measuring qualities such as self-efficacy, social supports, and emotional reactivity with responses rated on a 5-point Likert scale, 1 being the lowest score and 5 being the highest (Sætren et al., 2019). In addition to these measures, participants also engaged in interviews with the researchers to explore their perceptions of experiences in their daily lives, such as social interactions and internal thoughts. Caughter and Dunsmuir (2017) used the Reliable Change Index (RCI), which calculates statistical significance, to determine whether changes in the two measures were significant. Researchers found that resilience scores increased for six of the seven participants, with four displaying increased resourcefulness scores and six displaying decreased vulnerability scores, and all participants showed reduced impact of stuttering in their daily lives. Additionally, certain themes related to resilience were found in the interviews with participants post-treatment such as persisting through adversity, use of coping skills, and recovering from negative experiences more quickly. Although preliminary, these results indicate the benefit of targeting resilience in therapy with children who stutter. Taken together, these few studies examining the effects of cultivating resilience in treatment are promising yet lack a strong empirical basis. Moreover, many of the studies comprised modest sample sizes and focused primarily on internal factors of resilience, with less emphasis on external factors of social supports. As expressed by Ungar (2008), external factors may be just as important as internal ones to fully understanding the concept of resilience, thus confirming this as a vital area of research.

Summary and Study Aim

The adult and child literature indicate that resilience may act as a buffer against adverse impact related to stuttering (Caughter & Dunsmuir, 2017; Craig et al., 2011; Druker et al., 2019;

Freud & Amir, 2020; Plexico et al., 2019). However, in most studies with adults who stutter, measures of adverse impact were not necessarily specific to the stuttering condition, rather general indices (Craig et al., 2011; Plexico et al., 2019). Therefore in this study, we will utilize the OASES which is a comprehensive assessment of adverse impact specifically relating to stuttering that provides a detailed description of the impact an individual's stutter has on their life (Briley et al., 2020; Yaruss, 2007). This direct measure of adverse impact may allow for results that are more specific to the stuttering condition.

In children who stutter, the few studies related to resilience focused on potential benefits from cultivating greater resilience in stuttering therapy. While preliminary findings are promising, treatment studies will benefit from empirical research exploring the role resilience plays in the development of stuttering's adverse impact in children. Furthermore, we lack a clear understanding of when and how adverse impact emerges in kids who stutter and what factors may mitigate the risk of developing adverse impact. Therefore, to address these gaps in our knowledge, the aim of the current study is to investigate resilience in children who stutter and the role it may play in the development of stuttering's adverse impact. We hypothesize that there will be a significant relationship between adverse impact and resilience such that children with higher resilience scores on the CYRM-R will have lower scores on the OASES indicating less adverse impact.

Resilience is a combination of various factors, specifically the intersection of internal factors (e.g., temperament, ability to cope) and external factors (e.g., one's personal experiences and resources). The position of resilience at this crossroad may allow us to gain insight into the role that resilience may play in the development of adverse impact in many people who stutter. A better understanding of factors that may mitigate stuttering's adverse impact across development

will help shed light on the variability in adverse impact experienced by children who stutter and provide empirical support for therapies aimed at cultivating resilience in these children. Thus, the aim of the present study is to examine the relationship between resilience and stuttering's adverse impact in children who stutter.

Methods

The data used in this study were collected as part of a larger ongoing project in the Developmental Speech Lab at Michigan State University, exploring the development of stuttering in young children including its adverse impact. This project is approved by the International Review Board at Michigan State University (STUDY# 00001704).

Participants

Participants were recruited using two methods of sampling: convenience sampling and snowball sampling. Convenience sampling involved individuals the researchers have access to, including other stuttering researchers, clinicians, and faculty. With snowball sampling, the researchers sent recruitment materials to clinicians, asking them to share information about the study with interested families and colleagues. The researchers directly contacted over 2000 speech-language pathologists (SLPs) employed in schools and clinics as well as stuttering faculty at universities and colleges nationwide to recruit children who stutter and their families to the study. Participants were also recruited via forums and social media outlets limited to SLPs working in the schools and/or with clients who stutter and through word-of-mouth, as well as by reaching out to national and international stuttering associations, help groups, and participants who had already participated in stuttering research studies. Those contacted through these various methods were encouraged to share the recruitment materials with other people they know who stutter and/or families of children who stutter. Due to these sampling methods, the total number of parents of children and adults who were contacted cannot be determined.

Before accepting potential participants into the study, individuals were screened to ensure that parents considered their child to be a person who stutters and that the child was between the ages of 3-18 years. Participants were compensated for completed surveys. Children who stutter

received \$10 for completing the survey that included the age-appropriate measures included in this study. Parents, and in three cases a relative, of children who stutter received \$50 for completing two surveys that each contained an assessment included in this study: \$30 for survey that included the resilience measure and \$20 for the survey that included the adverse impact measure.

Measures

All surveys were conducted via the internet using Qualtrics. Parents were emailed unique links to the surveys that they or their child were eligible to take. Eligibility was based on child age. Informed consent was obtained from parents of children who stutter or children who stutter over 18 years of age. Assent was obtained for children who stutter over the age of 8 years.

All adult participants and parents of child participants completed a questionnaire gathering demographic information. Adverse impact of stuttering was measured using an age-appropriate version of the OASES version and resilience was measured using the Child or Youth version of the Resilience Measure (CYRM-R). While measures administered to participants in the larger study were divided into multiple surveys to prevent fatigue, the child-completed version of the OASES and CYRM-R were taken in the same survey.

OASES

The OASES includes three versions for children under the age of 18 years: the OASES Early Childhood Parent (OASES-EC-P; Yaruss & Yaruss, 2021), the OASES Student and the OASES Teen (OASES-S; OASES-T; Yaruss & Quesal, 2006, 2016). The OASES-EC-P is designed for children ages three to six years and is completed by the parent of the child who stutters. The OASES-S is designed for children ages 7 to 12 years and is typically completed by the child with guidance from their SLP as needed. In this case, parents were asked to read items

to their child (particularly for younger participants) and/or help their child interpret directions or questions on the assessments. It is important to note that parents were expressly asked not to answer for their child or influence how their child answered each question. The OASES-T is designed for teens ages 13 to 17 years and is completed by the child. All versions of the OASES comprise four sections – General Information, Reactions to Stuttering, Communication in Daily Situations, and Quality of Life – and each section includes questions requiring the participant to respond using a 5-point Likert scale. Note that the study included a number of 18-year-olds who are eligible to take the OASES-A (for adults who stutter aged 18 and up). However, we had these individuals take the OASES-T to reduce the number of OASES versions used in the study. Impact scores are computed by dividing the total number of points in each section by the total number of items completed in each section; if there are missing data points, the average is only taken over the questions respondents answered. Scores range from 1.0 to 5.0, with 1.0 being a mild impact rating and 5.0 being a severe impact rating. We will be using the total score, which can be computed by summing the total points of the measure and dividing that number by the total number of items completed.

CYRM-R

In this study, we adopt the Ungar (2008) framework assessing resilience in terms of an individual's ability to seek out the support they need and the availability of relevant resources for them to use if and when they do reach out, the same framework that serves as the basis for the CYRM-R. The CYRM-R is a self-report measure of resilience comprised of two subscales, one assessing internal resilience and one assessing external resilience, designed for children aged 5-23 years (Jeffries et al., 2018; Resilience Research Centre, 2018). In this study, the CYRM-R child was taken by 5- to 9-year-old children who stutter, while the CYRM-R youth was taken by

10- to 18-year-old children who stutter. The PMK-CYRM-R is a version of the CYRM-R completed by someone familiar with the child, identified as the person most knowledgeable (PMK). The PMK is anyone who holds a significant place in the participant's life and knows them well, for example, a caregiver, sibling, or teacher. Parents or legal guardians, henceforth referred to simply as 'parents,' were asked to complete the PMK-CYRM-R for all 5- to 18-year-old children who stutter. As with the OASES, children under the age of 12 years were encouraged to have their parent or guardian help them interpret the instructions and questions as needed. The PMK-CYRM-R, CYRM-R child, and CYRM-R youth each comprise 17 items in which children/parents indicated their level of agreement using a 5-point Likert scale. The items on each version of this measure are identical apart from the use of first person (CYRM-R youth, for example, "I cooperate with people around me."), second person (CYRM-R child, for example, "Do you share with people around you?"), or third person (PMK-CYRM-R, for example, "They cooperate/share with people around them") pronouns. Children who stutter taking the CYRM-R child are aided by smiley faces to help indicate level of agreement on the 5-point Likert scale.

To score the assessment, all items are summed to obtain a total score of the respondent's resilience. Thus, the minimum score is 17 and the maximum is 85, with a lower number representing a lower resilience score and a higher number indicating a higher resilience score. We would note that the authors of this measure caution strongly against comparing results to other populations stating, "resilience is likely to vary between contexts, and so any thresholds would similarly vary. For this reason, our recommendation is to instead contrast high and low scorers within your sample" (p. 14). Instead, CYRM-R scores can be interpreted relative to each other by comparing higher scores to lower scores, with higher scores indicating more resilience

and lower scores indicating less resilience (Resilience Research Centre, 2018). While the CYRM-R Manual cautions against using hard cutoffs for resilience scores, it provides general thresholds for scoring based on the Canadian data from one of the original CYRM-R studies, with four ratings identified: Low Resilience (< 63), Moderate Resilience (63-70), High Resilience (71-76), Exceptional Resilience (> 77). If there are any missing data points in a subjects' responses to the CYRM-R, those responses are left out of analysis as they are incomplete scores and cannot be accurately calculated.

All versions of the CYRM-R include two subscales: personal resilience and caregiver resilience. The personal resilience subscale provides information on the intrapersonal (e.g., CYRM-R youth Item 2: "Getting an education is important to me") and interpersonal (e.g., CYRM-R youth Item 7: "People like to spend time with me") traits related to resilience, while the caregiver resilience subscale examines characteristics linked to an individual's relationship with their primary caregiver, partner, and/or their family. These scales provide more detailed information on an individual's overall resilience score, allowing for a clearer interpretation. If an individual receives a lower overall resilience score, the subscales may show whether that score is due more to external factors (caregiver resilience) or internal factors (personal resilience). The personal resilience subscale score is calculated by summing 10 items in the assessment, specified in the manual, resulting in a score between 10 and 50. The caregiver resilience subscale score is calculated by summing 7 items in the assessment, as specified in the manual, resulting in a score between 7 and 35. As with the overall resilience score, on either subscale, a lower number represents a lower personal or caregiver resilience and a higher number represents a higher personal or caregiver resilience.

Analysis

Data was analyzed using descriptive and inferential statistics. The first quartile, median, third quartile, and interquartile range were calculated for the total scores of each version of the OASES and the CYRM-R, as well as each of the four OASES sections and the two CYRM-R subscales.

We computed three simple linear regression analyses to determine the relationship between resilience and adverse impact for children in the three age groups: preschoolers (ages 3-6 years), school-aged (ages 7-12 years), and adolescents (ages 13-18 years) to examine whether resilience predicted adverse impact. For each model, the age-appropriate total CYRM-R score was our predictor variable and the age-appropriate OASES total score was our outcome variable. The following assumptions for using linear regression analysis were met: the variables used in the analyses (total scores) were continuous; a correlational analysis confirmed that a relationship between the two variables (CYRM-R and OASES) existed; homoscedasticity was determined by visual inspection of the residuals along the regression line (line of best fit); the independence of observations was confirmed with a Durbin-Watson statistic; and there was an approximately normal distribution of residuals and errors. In these preliminary analyses, we detected one significant outlier in our dataset. One male participant's CYRM-R youth score was greater than four standard deviations below the mean. This subject reported the lowest possible score for the CYRM-R youth (i.e., consistently rated each question a '1'). This score did not corroborate this child's PMK score nor his OASES score in which he also rated each item consistently as a '1.' Given the potential that this child may have misunderstood the directions for responses along with the extremity of his score, this child's data was removed from the dataset. Lastly, we examined the correlation between child responses from the CYRM-R child and the CYRM-R

youth with parent/guardian responses from the PMK-CYRM-R to explore the relationship between parent-report and child-report measures of resilience.

Results

Demographics

Table 1 provides information on child participant demographics, including age, sex, race, and ethnicity. Child participant ages ranged from 3-18 years with the majority of participants being between 7- to 12-years (51%). There were more male (76%) than female (23%) participants and most parents identified their child’s race as “White/Caucasian” (80.4%) and ethnicity as “Not Hispanic/Latino” (89.9%).

Table 1: *Child participant demographics.*

Demographic	Number	Percent (%)
Sex		
Male	113	76.4
Female	34	23.0
No response	1	0.7
Age		
3-6 years	35	23.6
7-12 years	76	51.4
13-18 years	37	25.0
Race		
White/Caucasian	119	80.4
Mixed	12	8.1
Black/African American	7	4.7
Asian	3	2.0
No response	7	4.7
Ethnicity		
Not Hispanic/Latino	133	89.9
Hispanic/Latino	6	4.1
No response	9	6.1

Table 2 displays relevant PMK demographics, including the participants’ preferred title as well as their level of education. The majority of PMK respondents identified as “mom” or “mother” (87%). Approximately 80% of PMK participants graduated from a standard college or

obtained a professional school degree while nearly 18% reported partial college or fewer years of education.

Table 2: *Person most knowledgeable demographics.*

Demographic	Number	Percent (%)
Title		
Mom/Mother	129	87.2
Dad/Father	13	8.8
Parent	3	2.0
Grandfather	1	0.7
Grandmother	1	0.7
Aunt - Guardian	1	0.7
Education		
Partial high school	1	0.7
High school graduate	4	2.7
Partial college/ >1 year specialized training	21	14.2
Standard college/university graduation	65	43.9
Graduate/professional school degree	54	36.5
No response	3	2.0

Descriptive Statistics

The median, first, third quartiles and interquartile ranges were calculated for each version of the OASES (-EC-P, -S, -T) and each version of the CYRM-R (PMK-, child, youth).

OASES

OASES scores were interpreted in terms of level of impact due to stuttering according to the following 5-point scale: Mild (1.00-1.49), Mild/Moderate (1.50-2.24), Moderate (2.25-2.99), Moderate/Severe (3.00-3.74), Severe (3.75-5.00). The total median score was 2.08 for the OASES-EC-P, translating to a Mild/Moderate impact rating, 2.03 for the OASES-S, also translating to a Mild/Moderate impact rating, and 2.35 for the OASES-T, which translates to a Moderate impact rating, with each version's impact ratings ranging from Mild/Moderate in Q₁

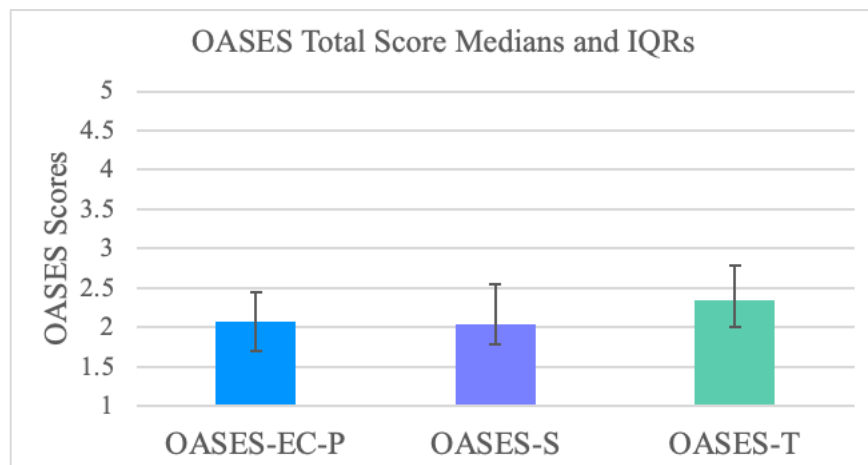
and Moderate in Q₃. The values of the OASES section scores and total score for each version are provided in Table 3.

Table 3: OASES median and interquartile range values for section 1 (S1), section 2 (S2), section 3 (S3), section 4 (S4), and total score (T).

	OASES-EC-P					OASES-S					OASES-T				
	S1	S2	S3	S4	T	S1	S2	S3	S4	T	S1	S2	S3	S4	T
Q1	2.3	1.6	1.6	1.3	1.7	2.3	1.6	1.3	1	1.8	2.3	2	2.1	1.5	2
Median	2.7	2	2.1	1.6	2.1	2.7	2	2	2	2	2.6	2.4	2.6	2	2.4
Q3	3	2.3	3	2.1	2.4	3	2.7	2.4	2	2.6	2.8	3	2.9	2.8	2.8
IQR	0.7	0.7	1.4	0.8	0.7	0.7	1.2	1.1	1	0.8	0.5	1	0.8	1.3	0.8

Figure 1 displays the median of each version of the OASES with error bars displaying the interquartile range (-EC-P: 0.74, -S: 0.77, -T: 0.78). Medians for each version of the OASES were similar, with total scores falling within 0.32 of each other, however the impact rating of the OASES-EC-P and the OASES-S total median scores were lower than that of the OASES-T. The OASES-EC-P and OASES-S total median scores were equivalent to a Mild/Moderate rating, while the impact rating of the OASES-T median scores translated to a Moderate rating, indicating that overall, children between the ages of 13 and 18 years experienced more adverse impact overall than children in the preschool and school-aged groups.

Figure 1: OASES Total Score Medians and Interquartile Ranges.



In three of the four OASES sections (Section 2: Your Reactions to Stuttering, Section 3: Communication in Daily Situations, Section 4: Quality of Life), the median scores of the OASES-EC-P and the OASES-S are lower than the median scores for the OASES-T, reflecting higher impact ratings on these subscales reported in teenagers. Overall, school-aged children’s and parent’s median scores on the OASES Section 1: General Information were the highest (both 2.67). This section assesses knowledge about stuttering and median scores on the OASES-EC-P and OASES-S reflected moderate impact indicating that less knowledge of stuttering contributed to overall adverse impact as reported by parents of preschoolers who stutter and school-aged children who stutter.

All three versions of the OASES were found to have the lowest median score in Section 4: Quality of Life, with scores reflecting a Mild/Moderate impact rating. This section probes activity limitations and whether stuttering is negatively affecting a child’s life, indicating that quality of life contributed less than other areas to overall adverse impact.

CYRM-R

The values of the CYRM-R subscale scores (Personal or Caregiver) and total score for each version are provided in Table 4.

Table 4: *CYRM-R median and interquartile range values for the personal subscale (P), the caregiver subscale (C), and the total scores (T).*

	PMK-CYRM-R			CYRM-R child			CYRM-R youth		
	P	C	T	P	C	T	P	C	T
Q1	39	32	71	38.3	30	68.3	38.8	30	68.5
Median	43	34	76.5	42.5	32.5	73.5	44	33	76
Q3	46.3	35	81	46	34	80	47	34	81
IQR	7.3	3	10	7.8	4	11.8	8.3	4	12.5

Four adult respondents for the PMK-CYRM-R and two adolescent respondents for the CYRM-R youth were excluded due to missing data points.

Figure 2: *CYRM-R Total Score Medians and Interquartile Ranges.*

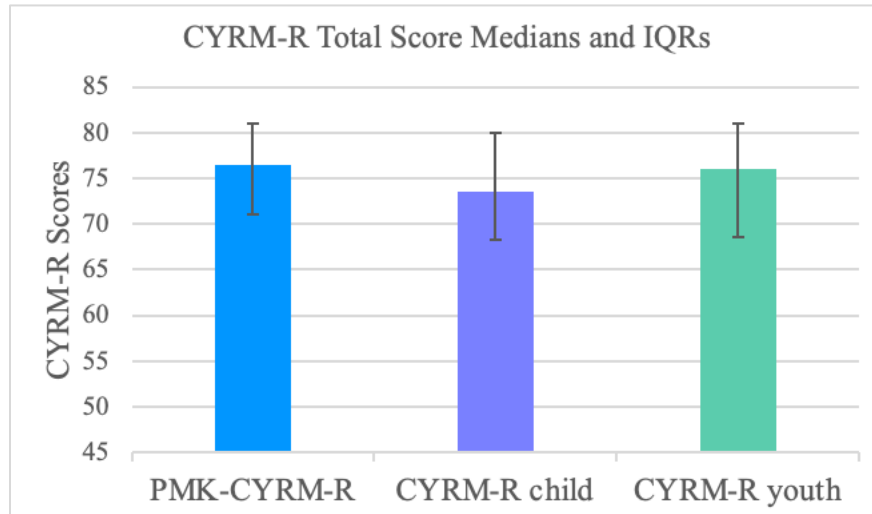


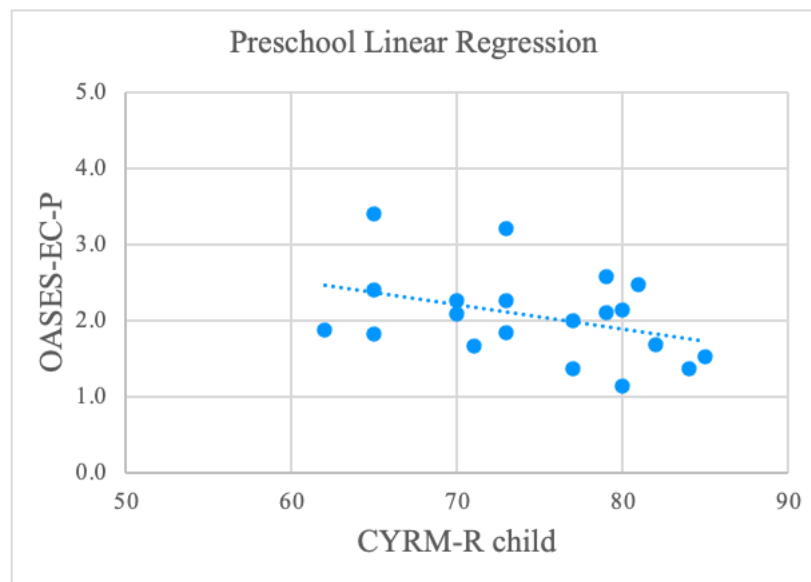
Figure 2 displays the median of each version of the CYRM-R with error bars indicating the interquartile range (PMK-: 10, child: 11.75, youth: 12.5). Overall, the total score medians among the three versions of the CYRM-R were fairly similar, with the PMK-CYRM-R median being the highest, (76.50) followed by the CYRM-R youth with a median of 76 and the CYRM-R child with a median of 73.50. Total scores for the three versions typically fluctuated between moderate and exceptional resilience.

Relative to the highest possible score for each subscale, the scores for the personal subscale reflected, on average, lower resilience than the scores for the caregiver subscale in each version of the CYRM-R, providing some insight into the contributions of internal or external resilience to the total score—the higher relative scores in the caregiver subscale reflect higher contribution to resilience from external resources than internal resources reflected in the personal subscale.

Linear Regression

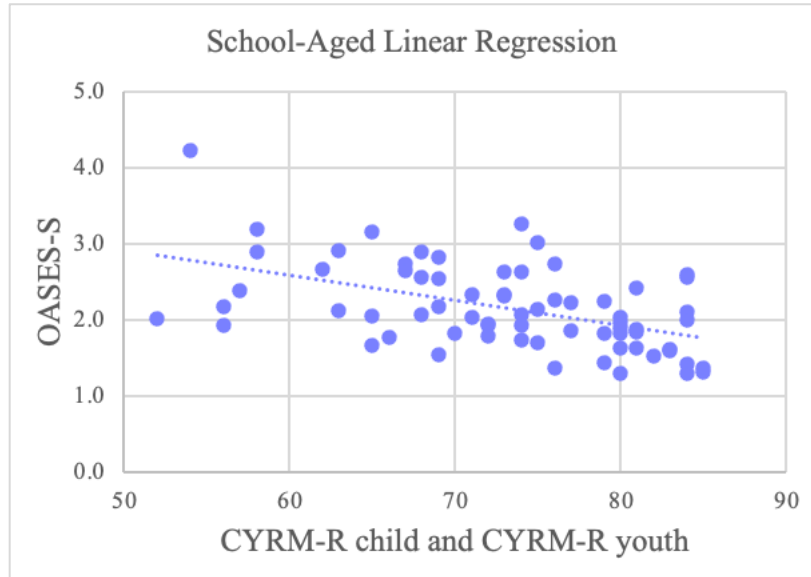
Three simple linear regressions, one for each age group, were calculated to predict OASES Total (OASES-EC-P, OASES-S, and OASES-T) score based upon children's CYRM-R total score (CYRM-R child, CYRM-R youth). Figure 3 shows the scatterplot with trendline for OASES-EC-P total scores by CYRM-R child scores for the preschool group. The regression equation did not significantly predict OASES-EC-P Total score, $R^2 = .15$, $F(1, 19) = 3.18$, $p = .09$.

Figure 3: *Linear regression analysis for the preschool group.*



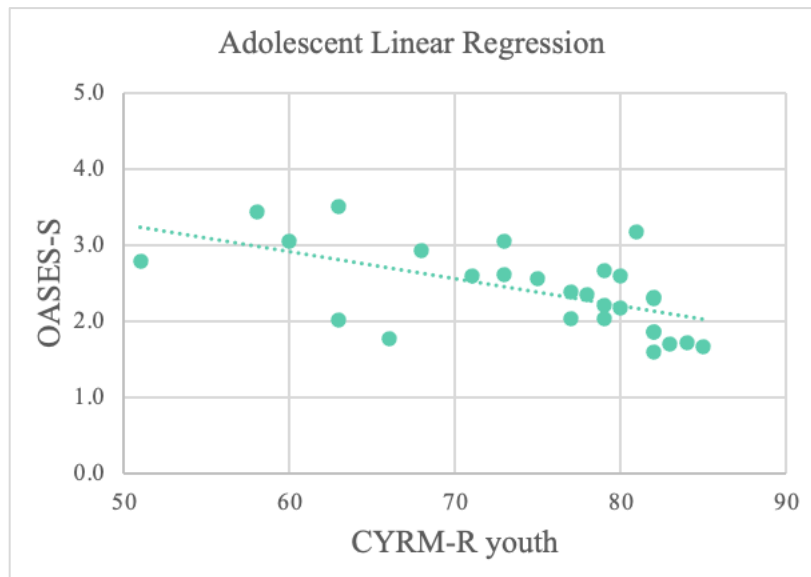
For the school-aged group, a significant regression equation was found that significantly predicted OASES-S Total score, $R^2 = .26$, $F(1, 68) = 23.06$, $p < .001$. The scatterplot of CYRM-R child (7-9 years) and CYRM-R youth (10-12 years) scores by OASES-S scores with trendline is displayed in Figure 4.

Figure 4: *Linear regression analysis for the school-aged group.*



Finally, the linear regression equation calculated for the adolescent group also significantly predicted OASES-T score, $R^2 = .34$, $F(1, 27) = 13.40$, $p = <.001$. Figure 5 shows the scatterplot of an adolescent's CYRM-R youth score plotted against their OASES-T score.

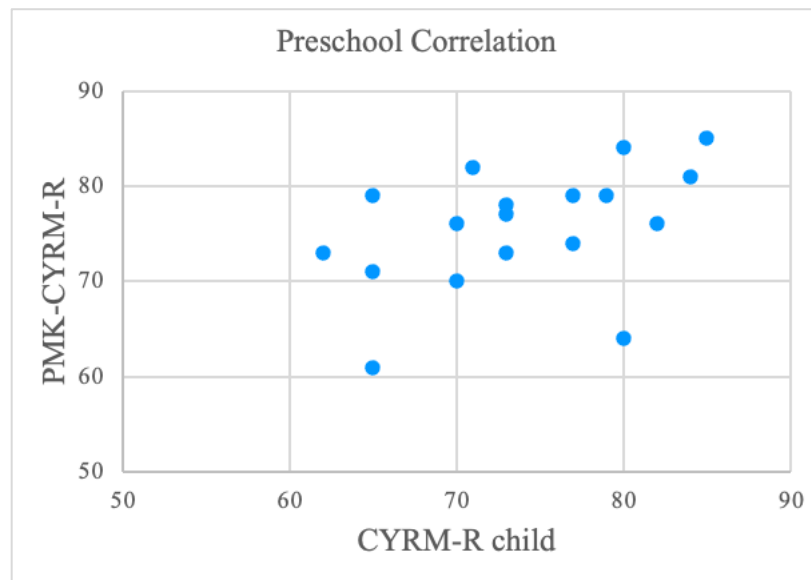
Figure 5: *Linear regression analysis for the adolescent group*



Correlational Analysis

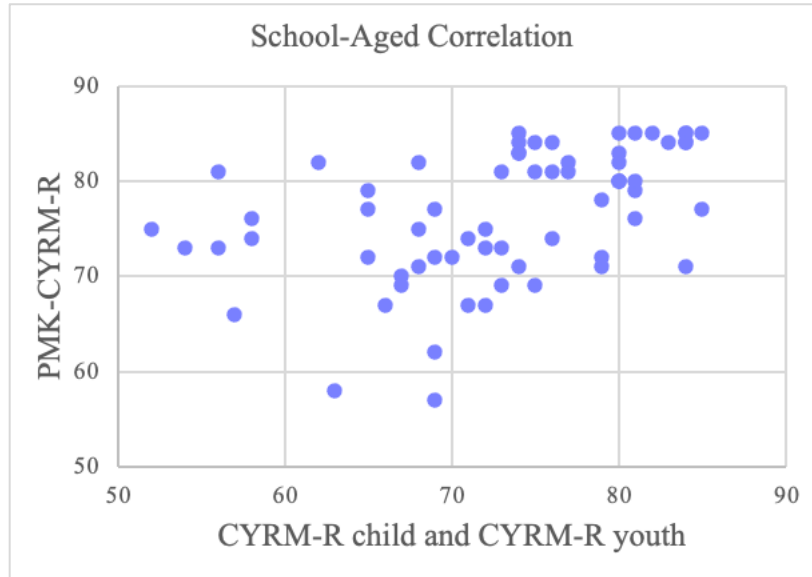
Pearson-product correlations between the PMK-CYRM-R and responses on the CYRM-R child and CYRM-R youth for all three age groups were calculated. The correlation equation calculated for the preschool age group demonstrated a positive correlation that narrowly missed statistical significance, $R^2 = .45$, $p = .06$. This relationship is visualized in Figure 6 below.

Figure 6: *Correlational analysis for the preschool group.*



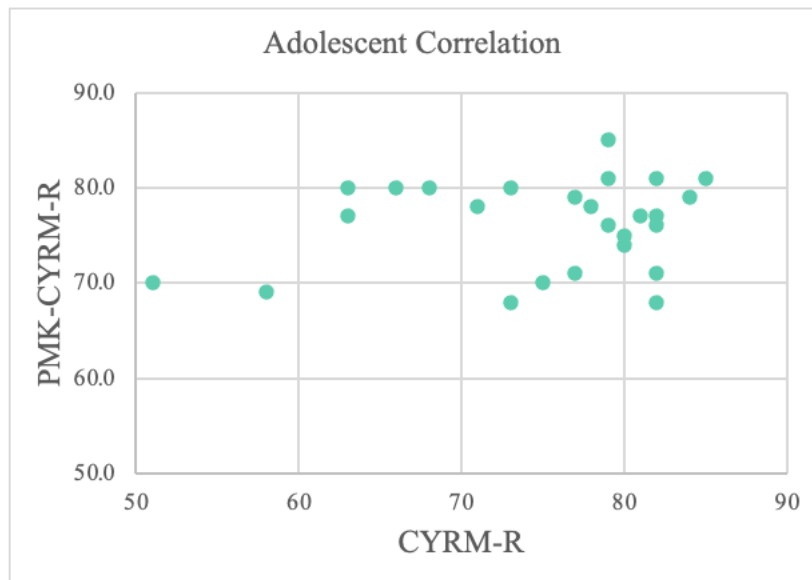
The correlation equation calculated for the school-aged child group demonstrated a positive correlation that was statistically significant, $R^2 = .46$, $p = <.001$. This relationship is visualized in Figure 7 below.

Figure 7: Correlational analysis for the school-aged group.



Finally, the positive correlation between CYRM-R youth and PMK-CYRM-R was not statistically significant, $R^2 = .21$, $p = .30$. This relationship can be viewed in Figure 8 below.

Figure 8: Correlational analysis for the school-aged group.



Discussion

This study explored the relationship between resilience and the adverse impact experienced due to stuttering. Resilience itself is a combination of internal and external factors – self-esteem, grit, family support, etc. – and studying this complex construct provides a window into factors contributing to the experiences of a person who stutters. Resilience includes both internal and external factors, allowing us to gain insight into the role resilience plays in the development of adverse impact in many people who stutter. As a first step toward understanding this relationship, we examined whether children’s resilience scores predicted their scores on the OASES, our measure of stuttering’s adverse impact. We found that higher resilience scores significantly predicted less adverse impact of stuttering in school-age and adolescent children who stutter, although the trend seen in preschool children who stutter did not reach significance. Significant correlations between parent-report and child-report measures of resilience were found for the school-age children, but not for the preschool or adolescent groups.

Adverse Impact and Resilience in Children Who Stutter

Compared to other sections of the OASES, parents completing the OASES-EC-P and the children completing age-appropriate version of the OASES tended to have the highest median scores in Section 1: General Information. This section documents a child’s perception, knowledge, and feelings about their speech overall. Questions in this section inquire into the child’s ability to speak freely, how much they know about stuttering, and how they feel about themselves and their speech because of stuttering. Observing higher scores in this section suggests that less knowledge of stuttering contributed to overall adverse impact in all groups of children, in addition to more negative perceptions about their speech. This is important to note as

it supports the notion that education about stuttering should be emphasized in intervention with both parents and children as it can boost the child's perception and knowledge of their speech.

Total scores on the CYRM across all groups indicated, on average, higher levels of resilience ranging from 'moderate' to 'exceptional' using reference thresholds based on a North American sample provided in the CYRM-R manual (Daigneault et al., 2013). However, as noted previously, the authors of this measure caution strongly against comparing results to other populations. The relatively higher socioeconomic status observed in our sample may be at least one reason resilience scores skewed higher for this sample. As Ungar (2008) expressed, resilience is not only one's ability and knowledge in finding resources, but it is also the availability of supportive resources to an individual. Families with a higher socioeconomic status may be assumed to have easier access to some of those helpful resources than families with a lower socioeconomic status (Fergus & Zimmerman, 2005). Therefore, the on-average higher resilience scores of this sample could be linked to the overall higher socioeconomic status of the participants.

Adolescents, on average, achieved the highest median scores of adverse impact compared to the preschoolers and school-aged children, although there was only a marginal difference observed, with all three groups achieving OASES total scores ranging from Mild to Moderate/Severe, with most showing Mild/Moderate adverse impact of stuttering (Figure 1). The on-average higher scores observed in adolescents may indicate that they have accumulated more negative experiences due to being a person who stutters. Similar findings have been reported in other studies, with adolescents having more negative attitudes toward communication than younger children, increased anxiety, and on-average higher OASES scores (Beilby et al., 2012; Guttormsen et al., 2015; Smith et al., 2014).

Our study used a multi-informant approach for a comprehensive picture of a child's resilience. Interestingly, we found a significant positive relationship between parent and child resilience ratings for school-aged children but not for adolescents. Discrepancies between parent and adolescent ratings of family dynamics, communication and parenting practices are not uncommon (De Los Reyes et al., 2019; Stuart & Jose, 2012) and concerning, these discrepancies are associated with an increase in psychological problems and poorer well-being in adolescents (Kapetanovic & Boson, 2020). Further, a recent study seeking to identify desired supports of children who stutter found that most school-aged children and adolescents wanted their family to be better listeners and to treat them more naturally at home (Iimura et al., 2021). Inconsistent views expressed by parents and their adolescent who stutters along with the finding of higher scores on the 'General Information' section of the OASES indicate a need for SLPs to provide education about stuttering to both parents and children who stutter and to help children advocate for what they need and how their family can best support them. It is important for parents, especially in the adolescent years, to be familiar with ways to support their child who is stuttering.

We hypothesized that greater resilience would predict less adverse impact in children who stutter. The results from the school-age and adolescent groups' linear regression analyses demonstrate that greater resilience significantly predicted less adverse impact, thereby confirming our hypothesis. However, this relationship was not seen as clearly in the preschool children who stutter. One possibility is that adverse impact and resilience are developing in these young children, and they have not learned to apply attributes of resilience to stuttering specifically. However, we should be cautious when discussing the development of adverse impact related to stuttering as parents reported adverse impact on the OASES-EC-P that was

comparable to what school-aged and adolescent children who stutter noted per self-report. Furthermore, a trend between adverse impact and resilience is observable in the preschool data in Figure 3. A more likely possibility is that we were underpowered with only 20 subjects in the preschool group to detect a significant difference. Yet, our results demonstrated that even the youngest children who stutter in our sample were documented to have a degree of adverse impact. This is a critical finding in that it indicates the development of adverse impact may not necessarily be a linear process, rather, it could develop in a child who is stuttering at any point in their development.

Overall, our findings in children who stutter align with results reported in earlier studies with adults who stutter. Craig et al. (2011) noted that adults who stutter with greater resiliency (i.e., self-efficacy, social functioning, and perceived social support) suffered less overall adverse impact. Plexico et al. (2019) found that lower self-acceptance in adults who stutter was associated with lower levels of resilience. Additionally, results from Freud and Amir (2020) suggest a relationship between adverse impact and resilience, with participants who reported lower levels of adverse impact related to stuttering being more likely to have higher levels of resilience. Each of these studies suggested a relationship between resilience and adverse impact in adults who stutter. The current study extends this relationship to children who stutter.

Development of Resilience

The relationship between resilience and adverse impact offers insight into the variability in adverse impact experienced by people who stutter and thus, into the individuality of the experience of stuttering. Part of understanding its relationship to adverse impact requires an understanding of the development of resilience, which broader literature can shed light on. Fergus and Zimmerman (2005) emphasize the influence of parental factors in the development of

resilience, highlighting that they act as critical resources for youth in monitoring of behaviors, bolstering communication skills, and overall supporting their development. Zolkoski and Bullock (2012) conducted a review of children and youth services, providing information about resilience and resilience-based interventions. They theorized that everyone is born with the innate capacity for resilience, however the unfolding of life events increases or in some cases, decreases this capacity. As a child develops and accumulates life experiences, personal attributes such as coping skills along with environmental aspects, such as socioeconomic status and family support, mitigate the degree of adverse impact experienced. In a recent review on the development of resilience, Boyce et al. (2021) presents a framework suggesting that the interrelations among genes, environment, and developmental timing play key roles in a child's capacity for resilience. According to the authors, early environmental exposures to adversity may alter the developing brain and "render a child more susceptible to second or third hits by...psychological stressors later in life." (p. 5). The timing of environmental exposures is identified as a crucial piece to the puzzle, as there are hypothesized critical periods where positive and negative experiences may have greater impact. Each of these researchers provide insight into the complexity of the development of resilience and adverse impact and the role that the environment in which a child grows plays in this development.

The fact that many of our participants' families had higher socioeconomic standings may have strengthened the foundation for higher, on average, resilience scores. We did not, however, consider what Boyce et al. (2021) referred to as "psychological stressors" or Zolkoski and Bullock (2012), "unfolding life events" that may weaken a child's innate capacity for resilience. A follow-up study could look at the relationship between a child's resilience and the parent-reported number of psychological stressors that the child has experienced. As part of the larger,

longitudinal study being conducted by the Developmental Speech Lab, parents are asked to document their child's adverse life events, and these data may help shed additional light on the development of a child's resilience. The development of adverse impact in children who stutter is likely complex with multiple factors influencing how and when it emerges. Our study unraveled a piece of this puzzle by showing that greater resilience may be a protective factor as it predicted less adverse impact of stuttering in older children and adolescents.

Resilience in Therapy

Resilience-Based Therapy Approaches

It is important to note that although there are components of resilience that are inherent, researchers also consider resilience to be malleable and have long realized the importance of fostering greater resilience in children, particularly those at greater risk for adversity. In their systematic review and meta-analysis, Joyce et al. (2018) examined 11 randomized control trials of interventions aimed at improving resilience and found that resilience-based interventions combining cognitive behavioral therapy and mindfulness techniques seemed to positively impact individual resilience. These results are corroborated by other researchers who discuss the benefits of utilizing these techniques in stuttering therapy (Boyle, 2011; Harley, 2018; Kelman & Wheeler, 2015; Plexico & Sandage, 2011). While there are many aspects of resilience which could be targeted in stuttering therapy, Zolkoski and Bullock (2012) identified five attributes key to resilience from their systematic review which could serve as appropriate targets: social competence, problem-solving skills, critical consciousness, autonomy, and a sense of purpose. According to the authors, these five attributes allow resilience to thrive and support an individual's goals and future aspirations.

There have been a number of therapy programs developed to foster greater resiliency and enhance a child's ability to cope with setbacks and stressors that target the attributes proposed by Zolkoski and Bullock (2012). The Reaching in Reaching Out (RIRO; Reivich & Shatté, 2002) program was based on research at the University of Pennsylvania showing that the way people process and frame events has a significant impact on their resilience, their health, and their mood. This program was designed to indirectly cultivate greater resilience in infants and young children, from birth to six years, by teaching parents and workers who engage with young children how to recognize and reframe potentially negative thought processes to model healthier thinking habits in their interactions with children (Mikolas et al., 2021; Pearson & Hall, 2006). Another widely researched resilience program is the Penn Resilience Program (PRP; Gillham et al., 2006), a treatment program to improve psychological well-being and promote resilience in school-age children using cognitive behavioral therapy to teach helpful coping and problem-solving strategies. This group-based intervention program teaches children to identify negative perspectives and how to actively confront them with more constructive solutions. Children also learn relaxation techniques and how to become more assertive (Gillham et al., 2007, 2008). Both RIRO and PRP are founded in the principle that changing children's way of thinking and coping can allow them build internal resilience. A resilience program for older children that targets external aspects of resilience is the Resourceful Adolescent Program (RAP; Shochet et al., 1997). RAP is a group-based therapy program designed to improve skills and social resources by building upon strengths, teaching skills to help control stress and develop wider social networks by providing an environment to create interpersonal relationships with others (Shochet et al., 2001).

Each of these therapy programs aim to foster resilience in children through different approaches. RIRO relies on indirect approaches to empower caregivers to help their child and PRP works toward similar goals by directly engaging children. RAP fosters external resilience by helping adolescents build relationships and greater social supports.

Resilience in Stuttering Therapy for Children

Elements from these programs and the resilience framework we introduce that stresses the importance of internal and external factors, like parent involvement, can help guide clinicians in identifying targets to mitigate stuttering's adverse impact in therapy. Druker et al. (2019), for example, incorporated a parent-led resilience component into early intervention stuttering therapy, with children engaging in speech therapy in addition to parents receiving resilience training and incorporating the principles of resilience at home with their child. This approach resulted in decreased behavioral and emotional problems and increased strengths relating to resilience. Stuttering frequency decreased for both groups (i.e. with and without the resilience component added to speech therapy) showing that it did not change children's overt stuttering; however, it did improve their emotional and behavioral control as well as their overall resilience. Caughter and Dunsmuir (2017) also conducted a study utilizing resilience in stuttering therapy, with seven children attending group therapy sessions with their parents in a year-long program. Results demonstrated improved resiliency, specifically in the areas of decreased vulnerability and increased resourcefulness, as well as reduced impact of stuttering. Children also engaged in interviews post-therapy where researchers identified themes related to greater resilience in their responses when encountering adverse situations. These included persisting through adversity, use of coping skills, and recovering from negative experiences more quickly. These studies demonstrate that there are positive outcomes when resilience is targeted in stuttering therapy that

may prevent or reduce the amount of adverse impact children who stutter experience over time. Longitudinal data, of course, is necessary to confirm this assertion.

The current study provides the empirical evidence of a relationship between adverse impact related to stuttering and resilience which is necessary for future, larger-scale studies of holistic treatments which incorporate resilience building goals. Our findings suggest resilience mitigates adverse impact in children who stutter, making it an important area to target in stuttering therapy to help address the difficulties children may be experiencing. To foster greater internal resilience, particularly for those children who show lower internal or personal subscale scores, it would be helpful for SLPs to incorporate resilience-building for their clients into therapy. As seen from the two studies incorporating resilience into stuttering therapy, targeting internal factors such as self-confidence and coping skills in therapy may improve children's emotional wellbeing and reduce the impact adverse events may have on their lives (Caughter & Dunsmuir, 2017; Druker et al., 2019). This can be done in either a one-on-one or group therapy setting using principles from other programs targeting resilience, including modeling of resilience-boosting thinking patterns, education on how we think about and handle adversity, discussion of what the child may be struggling with, and discussion and practice of how to cope with future adverse events related to their stuttering (Gillham et al., 2008; Pearson & Hall, 2006; Shochet et al., 2001). A recent study found that children who frequently engaged in cognitive reappraisal, an emotional regulatory strategy that encourages more positive reframing of a difficult situation to alter its impact on a person (e.g., Lazarus & Folkman, 1984), were more likely to report lower levels of stuttering's adverse impact (Tichenor et al., in press). SLPs could implement these principles with children who stutter by practicing role playing adverse situations

they have encountered (or may encounter) and exploring how they could implement cognitive reappraisal strategies to foster greater resilience.

Although internal attributes are critical to the development of resilience, external factors, such as access to resources and degree of perceived support from one's family and community are equally important (Jeffries et al., 2018). Clinicians can help their clients and families navigate to the resources they need or connect them with school counselors, social workers, or make outside referrals to other professionals. For example, Potock (2017) provides valuable suggestions for SLPs to check in with children and families and screen for food insecurities.

Stuttering support groups for youth who stutter such as the Stuttering Association for the Young (SAY) and FRIENDS: The National Association for Young People who Stutter can also bolster children's internal and external resilience. SLPs play a key role in connecting children and families with supportive resources that can help children establish more social support networks and build skills to increase their confidence as communicators. For example, Camp Say, an overnight camp aimed to support children who stutter, was found to reduce the overall adverse impact of stuttering (Herring et al., 2022). Although the authors of this study did not measure resilience directly, they explored the effectiveness of self-help and supportive activities that could foster greater resilience in children attending the camp. Herring and colleagues found that children and adolescents generally experienced a reduction in adverse impact, as measured by the OASES, along with improvements in children's reactions to their stuttering and attitudes toward communication following camp. Herring and colleagues' findings demonstrate the value of connecting children who stutter with resources that can foster external and internal resilience.

Considerations and Future Directions

It is important to keep in mind that not all adverse impact experienced in childhood translates directly into adverse impact in adulthood, so it is critical to be mindful of the individual experiences of clients during intervention planning. Anecdotally, some adults who struggled with their stuttering in their youth and experienced adverse impact find themselves more resilient as adults, once they are on the “other side” of the difficulties they faced as a youth. Others, however, may feel a lasting negative imprint from childhood struggles. Leung et al. (2022) touch on this notion in their systematic review exploring how social supports impact resilience in the lives of emerging adults who experienced adversity in their childhood. From the articles reviewed, the authors identified key components that either contributed positively to resilience – such as one’s capacity for self-reliance and/or the presence of encouraging, supportive individuals in their lives – or negatively to resilience – such as deciding to isolate oneself from others and/or financial difficulties or unstable housing. These findings demonstrate the variability of resilience in how it develops and presents in adulthood.

In this study, we found support for the hypothesis that greater resilience predicts less adverse impact in children who stutter paving the way for other studies to continue exploring the role of resilience mitigating the adverse impact of stuttering. The CYRM-R includes fewer items devoted to exploring internal factors related to resilience so a future study could incorporate other measures of resilience, especially ones that more comprehensively address the internal aspects of resilience that could be targeted in therapy. Additionally, recruiting subjects for a larger sample with more diversity in socioeconomic status would be beneficial to see how resilience predicts adverse impact across socioeconomic tiers. A larger sample of children ages 3-6 may also be beneficial to achieve greater power and assess whether trends hold for this age

group. Lastly, the CYRM-R scores reported in this study accounted for a significant albeit modest portion of the total variability in OASES scores; therefore, it is important to continue exploring what other factors contribute to adverse impact. Given the variability of adverse impact, exploring other factors in addition to resiliency longitudinally in a multivariable model will provide greater insight into how adverse impact develops in children.

Conclusion

Stuttering is complex and presents differently in individuals, with diverse factors contributing to the speaker's overall experience and well-being. Adverse impact due to stuttering may emerge in people who stutter during different stages of their lives to different degrees which may be determined, in part, by the presence of risk or protective factors. Protective factors are those that lead to an increase in an individual's well-being and may include attributes such as a sense of control and independence, increased hope for the future, and the presence of positive social supports (Craig et al., 2011; Lyons & Roulstone, 2018; Plexico et al., 2019). Risk factors lead to a decrease in an individual's well-being and may include communication difficulties experienced by the speaker, difficulties forming and maintaining relationships, or a lower sense of self-efficacy. Resiliency is a multifaceted construct that could protect against adverse impact, encompassing how one uses their internal and external resources to cope and adapt in the face of adversity (Bonanno, 2004; Connor, 2006; Masten, 2001; Masten et al., 1990; O'Leary, 1998; Ungar, 2008). Resilience is influenced by internal and external factors including self-confidence, social support, and access to resources. In our study, resilience predicted adverse impact in children who stutter providing insight into the experience of stuttering and offer support for treatments that incorporate resilience building into therapy to help mitigate adverse impact experienced by children who stutter.

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