

# Proceedings of the 4<sup>th</sup> International Conference on Stuttering

*Edited by Donatella Tomaiuoli*



 Erickson

Proceedings of the 4<sup>th</sup> International  
Conference on Stuttering

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Erickson

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# Preface

I am glad to present the Proceedings of the fourth International Conference on Stuttering, held online from 14<sup>th</sup> to 16<sup>th</sup> October 2021. Since its establishment in 2012, the Conference has become an event held every years capable of bringing together leading experts from universities and the most advanced research and treatment centres from around the world, with the aim to outline the state of the art of the progress made in the clinical and research fields on disorders of verbal fluency, to the advantage of both the scientific and clinical national and international community.

This year, the prestigious Scientific Committee - composed by myself, the Emeritus Professor Ehud Yairi and Professor Mark Onslow - welcomed another member: Professor Kurt Eggers, whose expertise has played a crucial role in designing the three-day program of the Conference. I want to take the opportunity to express my gratitude to my colleagues, especially for their support when the pandemic represented a true game changer leading to the choice, for the first time since its foundation, to propose the Conference in virtual mode only.

The topics addressed during the last edition ranged from the progress of research on the aetiology of stuttering, to the diagnosis and assessment of stuttering for preschoolers and adults, to early diagnosis, to the effectiveness of different approaches and different methods of treatment. We had the pleasure of attending the high-quality lectures of some of our veterans who

were in good company with several newcomers and the scientific accuracy of their contributions. In addition, at the end of each day there was a one-hour long workshop, respectively about some innovative and functional treatment programs for children who stutter: Mini-KIDS, PLAY! and Lexipontix. Enriching contributions also came from authors who submitted their research projects answering our call for paper and poster opportunities. I would like to thank all the keynote speakers, presenters and authors, participants and attending students who contributed to the success of the Conference.

Finally, I would like to thank the suppliers, the Conference staff and the LiveFORUM platform for their digital support and those organizations which offered their patronage (The Stuttering Foundation of America, The European Speech and Language Therapy Association, The Politecnico of Milan, the European Clinical Specialization in Fluency Disorders and the European Fluency Specialists). I also thank Norma Camilleri, President of ESLA, Dr. Tiziana Rossetto, President of FLI and Franca Garzotto, Director of I3lab, for their kind support. And last but not the least, my special thanks go to Mrs. Jane Fraser, President of the Stuttering Foundation of America, co-sponsor of the Conference, who graced us with a unique presentation showing the incredible efforts made with her prestigious Institution to promote research, bring awareness and support researchers and specialists in the field of stuttering.

*Donatella Tomaiuoli*  
International Conference on Stuttering Convener

*Session 1*

# **Brain and genetic research in children who stutter**

## **THE ROLE OF SUPPLEMENTARY MOTOR AREA IN DEVELOPMENTAL STUTTERING**

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### ABSTRACT

Developmental stuttering (DS) is a neurodevelopmental disorder with a complex and multifactorial neurobiological basis. Neural markers involve the presence of abnormal activity of speech/motor brain regions, as well as impaired structural and functional connectivity. Dynamic interactions of these systems are regulated by cortico-basal-thalamo-cortical networks, where the supplementary motor area (SMA) may constitute a crucial neural «*hub*». SMA integrates information from wider circuits, thus managing complex motor acts such as «*self-paced*» movements and complex motor

sequences (e.g. speech). An abnormal activity/connectivity/structure of SMA is increasingly reported in DS, suggesting that this could be an additional neural marker of the impaired neural functioning usually identified in people who stutter (PWS), especially in the left hemisphere. Compatibly, recent findings suggest that, in PWS, SMA may be part of «*poorly synchronized*» and/or «*delayed*» neural networks, resulting in suitable substrates for the appearance of DS symptoms. However, as highlighted also by recent neural modelling, the role of SMA in DS has not been fully clarified yet. SMA may be considered as having a fundamental role in DS, receiving and conveying a high amount of (altered or not) neural information, thus «*gating*» the release of correct or abnormal motor plans. Importantly, SMA activity may be conditioned by a series of variables, such as external/sensorial/rhythmic cues, anxiety and/or heightened arousal, thus resulting in «*positive*» or «*negative*» modulating factors of speech fluency. In conclusion, the role of SMA in DS should receive higher attention and consideration in research, especially when tailoring new treatments and/or rehabilitation solutions, such as those based on non-invasive brain stimulation and neuromodulation.

## **Introduction**

Developmental stuttering (DS) is a neurodevelopmental and idiopathic disorder that usually appears during childhood. DS is characterized by the presence of blocks and repetitions, especially in the first part of words and sentences, thus leading to speech dysfluencies. Associated oro-facial movements may be also evident, even if they are not strictly related to the current and/or «*intended*» speech motor programs. The majority of children with DS may recover a normal speech fluency in a «*spontaneous*» and/or unassisted way. However, stuttering may also persist in adulthood, thus strongly affecting quality of life. To date, we know that DS is a multifactorial disorder: variables such as genetic and neural abnormalities have an overlapping role in the appearance and maintenance of this disturbance (Alm, 2004; Barnes et al., 2016; Craig-McQuaide et al. 2014; Drayna & Kang, 2011; Etchell et al., 2018). In this brief report, we will concentrate on the defective neural substrates of stuttering.

## The defective neural substrates of DS

In the last decades, research was able to identify diffuse patterns of brain abnormalities, that seems to characterize the neural functioning of people who stutter (PWS; Brown et al., 2005; Craig-McQuaide et al., 2014; Etchell et al., 2018; Neef et al., 2015). These abnormalities play a role in tasks such as motor planning, preparation, and execution, especially when considering complex motor sequences, such as those needed for successful speech implementation (Alm, 2004; Chang & Guenther, 2020; Civier et al., 2010, 2013; Etchell et al., 2018). As a consequence, a series of «*neural markers*», typical of DS, may be suggested (Brown et al., 2005; Chang & Guenther, 2020; Neef et al., 2015). They can be summarized as: - *the hypoactivation of speech/motor structures of the left hemisphere* (Watkins et al., 2008; Desai et al., 2017; Neef et al., 2015); - *a larger hyperactivation of the homologous regions of the right hemisphere* (Brown et al., 2005; Neef et al., 2015); - *the presence of impaired/abnormal structures of the gray and white matter of the brain*, resulting in an altered connectivity of cerebral patterns, and thus responsible for impaired neural communication (Etchell et al., 2018; Sommer et al., 2002; Watkins et al., 2008); - *the presence of an altered neural activity in cortico-basal-thalamo-cortical circuits* (Chang & Guenther, 2020; Giraud et al., 2008; Wu et al., 1995), also in relation to «*defective*» dopaminergic and/or metabolic regulations (Wu et al., 1997; Alm, 2004; see, for recent perspectives, Alm, 2021; Maguire et al., 2021; Turk et al., 2021); - *the presence of altered sensorimotor interactions*, at a neural level («*audio-motor*» interactions, «*sensory-to-motor*» feedbacks and transformations, «*motor-to-sensory*» projections and information; Daliri & Max, 2015; Jenson et al., 2020; Saltuklaroglu et al., 2017), which may result in alterations of «*functional*» communications among a wider range of brain networks.

Interestingly, all these abnormalities are not exclusively related to speech tasks, but can also be registered during non-speech motor tasks, and at rest (Busan et al., 2017; Chang et al., 2009, 2018; Desai et al., 2017; Wu et al., 1997). In all this evidence, DS is especially characterized by a defective functioning of the cortico-basal-thalamo-cortical systems, in which subcortical structures, such as basal ganglia, are fundamental

parts of the network (Alm, 2004; Chang & Guenther, 2020; Etchell et al., 2018; Giraud et al., 2008; Toyomura et al., 2011, 2015). Similarly, their cortical targets, such as the supplementary motor area (SMA), could also play a central role in the correct functioning of these systems (Busan, 2020; Chang & Guenther, 2020). More specifically, cortico-basal-thalamo-cortical circuits are part of an «*internal timing network*» (managing «*volitional*» and internally-generated motor acts, such as speech) that seems to be defective in DS (Etchell et al., 2014). The «*internal timing network*» is in contraposition to an «*external timing network*» (mainly composed by the cerebellum and lateral premotor cortices), that may have a role in compensatory processes of DS, basing on the elaboration of external and sensorial cues (Etchell et al., 2014).

### **Anatomical and functional subdivisions of the sma «complex»**

As anticipated, SMA is an important cortical structure of the cortico-basal-thalamo-cortical networks, useful for managing complex motor acts, such as speech. More specifically, the SMA «*complex*» may be divided into a «*proper-SMA*» region and a «*pre-SMA*» region. The «*proper-SMA*» region is mainly connected with motor structures, whereas the «*pre-SMA*» is mainly connected with executive and cognitive regions, such as those of the prefrontal cortex (Johansen-Berg et al., 2004; Klein et al., 2007; Nachev et al., 2008; Picard & Strick, 1996; Ruan et al., 2018). As reported above, the SMA «*complex*» may be fundamental for the correct implementation of complex and/or internally-generated motor sequences, thanks to the neural information that is shared with basal ganglia (by means of the «*fronto-striatal tract*»), but also with frontal cortex (by means of the «*frontal aslant tract*»; Ikeda et al., 1999; Kinoshita et al., 2015; Narayana et al., 2012; Rochas et al., 2013; Ruan et al., 2018; Seitz et al., 2006). Interestingly, the direct stimulation (or a lesion) of the SMA «*complex*» (and its related networks) may easily result in induced (neurogenic) stuttering and speech dysfluencies (Abe et al., 1992, 1993; Ackermann et al., 1996; Alexander et al., 1987; Van Borsel et al., 1998; see also Ackermann & Riecker, 2011; Penfield & Welch, 1951).

## The role of the SMA «complex» in DS

In this context, an altered functioning of the basal ganglia system is frequently highlighted in DS (Alm, 2004; Watkins et al., 2008; Wu et al., 1995, 1997), also in association to stuttering severity (Giraud et al., 2008; Toyomura et al., 2011). This may likely result in a «*disequilibrium*» of excitatory/inhibitory motor signals (Busan et al., 2017) affecting the correct functioning of connected cortical targets, such as the SMA «*complex*», and thus easily resulting in a defective programming and/or implementation of complex motor sequences, such as those related to speech (Busan, 2020; Chang & Guenther, 2020). Compatibly, the abnormal activity and/or connectivity of the SMA «*complex*» may be recognized as a further «*neural marker*» of DS (Busan, 2020; Neef et al., 2015): SMA may result in lower or, more often, higher activity in PWS (especially when considering compensatory processes and/or the «*neural effort*» that may be useful to overcome dysfluencies; Neef et al., 2015; Toyomura et al., 2011). Similarly, its structural and functional connectivity may be abnormal or impaired (see, for a recent review, Busan, 2020). For example, Busan et al. (2019) showed that, when activating the SMA «*complex*» by means of transcranial magnetic stimulation (TMS), PWS may result in a lower level of activity in the SMA region, also resulting in a lower (or «*delayed*», with respect to fluent speakers) activation of a series of functionally connected motor and speech networks of the left hemisphere, such as the premotor ventral and the inferior frontal cortices. Interestingly, the brain of PWS seems to respond to this deficit by recruiting, in a successive temporal window, a series of fronto-temporal and homologue regions of the right hemisphere that, at the end, may try to «*re-activate*» the (initially stimulated) premotor and SMA regions. Surely, this «*re-activation*» may be interpreted as representing «*compensatory*» attempts of the neural system, but, overall, this process takes about 500 ms to be implemented, thus likely representing also a dynamic counterpart to the appearance of DS symptoms (speech dysfluencies). Indeed, delayed (or not «*synchronized*») activations of the SMA «*complex*» and its connected networks may easily result in functional breakdowns of the neural systems devoted to manage complex motor tasks, such as



speech programming and execution, also considering that speech normally relies on fast/highly synchronized motor sequences resulting in the precise coordination of speech muscles (see Busan, 2020).

### **The SMA «complex» and neural modelling of DS**

The described evidence also suggests that neural modelling may be a useful way to better rearrange neural impairments that characterize the abnormal functioning of brain circuitries involved in DS. In fact, the currently available models propose that DS may be characterized by difficulties in the synchronization of speech/motor components, or by difficulties in generating the correct speech/motor programs, possibly resulting in delayed elaborations (Howell, 2004; Perkins et al., 1991; Postma & Kolk, 1993). As a consequence, stuttering may be considered as the result of «*unstable*» internal models related to speech motor acts (Max et al., 2004). However, more recent computational models of DS have been proposed (Chang & Guenther, 2020; Civier et al., 2010, 2013) based on classical theorization of speech production such as the DIVA and GODIVA models (Bohland et al., 2010; Guenther, 1994, 2016; Guenther et al., 2006; Guenther & Vladusich, 2012; Tourville & Guenther, 2011), trying to further elucidate neural dynamics of stuttering. More specifically, while Chang & Guenther (2020) demonstrated that the impairment in the initiation of speech motor programs in DS is mainly due to cortico-basal-thalamo-cortical dysfunctions, Civier et al. (2013) considered the role of the associative motor cortices in the appearance of DS symptoms, thus modelling the role of basal ganglia, imbalanced levels of dopamine, premotor cortices, and white matter impairments in causing the symptoms of stuttering. In both proposals, authors conclude that, in DS, activations of (impaired) neural networks may be «*delayed*», resulting in an abnormal timing of neural connections, and thus easily becoming dysfluencies. However, in these models, even if the role of cortico-basal-thalamo-cortical networks was emphasized, the SMA «*complex*» was not considered to have a primary or a causal role in the disturbance. Surely, the SMA may be fundamental in a series of

aspects such as the correct selection and sequencing of motor programs, as well as in «gating» the outflow and/or the release of motor commands to speech articulators (Tourville & Guenther, 2011). As a consequence, this suggests a fundamental role also for this «hub» in the neural dynamics (and the appearance) of DS symptoms (Busan, 2020).

### The SMA «complex» and open questions in ds research

However, a series of open questions about the role of the SMA «complex» in DS still remain. For example, we know that symptoms of DS are alleviated by interventions that restore a «correct» managing of the rhythmic aspects of motor programming, such as the utilization of choral speech, metronome, or altered auditory feedback (Kalinowski & Saltuklaroglu, 2003; Kalinowski & Stuart, 1996; Toyomura et al., 2011, 2015). In this context, the functional role of the SMA «complex» should be further investigated by combining, for example, behavioral evidence with neuroimaging/neurophysiological methods, to better understand the neural substrates of these «positive» effects. On the other hand, also «negative» modulators of neural activity exist, such as anxiety and/or «heightened» arousal. In this context, we know that the SMA «complex» is functionally connected to the limbic system, especially when considering structures such as the cingulate cortex (see Craig-McQuaide et al., 2014, for a perspective in DS). The cingulate cortex shows modulations of its activity when facing emotional stimuli (Rolls, 2019), as well as when response preparation and/or anticipatory reactions are needed (Lorberbaum et al., 2004). Evidently, this may be of relevance to the physiopathology of stuttering: it may be plausible that atypical modulations of the SMA «complex» by the limbic system may interfere with the correct implementation of motor plans, or with correct motor initiation, in DS. Thus, relations of cortico-basal-thalamo-cortical networks with deeper structures such as the cingulate cortex (Connally et al., 2018), or the influence of «arousal» (e.g. anxiety) on the motor system of PWS should be further investigated (compare with Chang et al., 2018; Chow & Chang, 2017; Toyomura et al., 2018; Yang et al., 2017).

## How can this information be useful for improvements in rehabilitation outcomes of DS?

Research is constantly trying to translate the available evidence about the neural characteristics of DS in suggestions that can be useful to improve rehabilitation outcomes for PWS. For example, a recent trend is trying to investigate the effects of Non-Invasive Brain Stimulation (NIBS) on speech fluency, in stuttering (see Busan et al., 2021, for a review). In this context, the activity of the SMA «*complex*» can be also modulated by using NIBS, thus investigating effects on stuttering severity and/or on related neural circuits: Garnett et al. (2019) evaluated the effects of a single session of transcranial direct current stimulation (tDCS) on stuttering, showing that tDCS was able to attenuate the existing correlation between stuttering severity and the activity of the right thalamo-cortical networks. Similarly, Mejías & Prieto (2019) realized a single case study, stimulating the SMA region with a TMS protocol, showing that rapid/stable improvements in speech fluency may be obtained. Obviously, these observations should be extended, but, considering the «*pivotal*» role of the SMA in the management of motor timing and in complex motor sequences (as well as its wide functional connectivity), neuromodulation attempts of the SMA «*complex*» should be further developed in DS (also in order to influence long-range neural networks), perhaps allowing to obtain stronger and/or more stable effects on speech fluency.

## Conclusions

In conclusion, the present report offers a focused view about the role of SMA in DS. Based on the available neuroimaging and neurophysiological findings, the SMA «*complex*» may have a «*functional*» role in DS, influencing the appearance of dysfluencies and the correct functioning of the neural system of PWS. Thus, the SMA can be considered as a possible and fundamental neural «*hub*» in stuttering, receiving and conveying altered neural information from and/or towards different neural networks, «*gating*» the release of (correct or abnormal) motor plans. Further research

and modelling will be needed to increase our understanding of the role of the SMA in this disturbance, especially when considering implications for neurorehabilitation: acting on the SMA and its related networks could give further suggestions about a series of unanswered questions in DS.

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## TEMPERAMENT, EMOTION, AND STUTTERING

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### ABSTRACT

the purpose of this conference proceedings is to provide an overview of our presentation on temperament, emotion, and stuttering given to the 2021 International Conference of Stuttering – IV Edition (Gubbio, Italy). One common contemporary perspective, which we focus on for our work, defines temperament as «constitutional (biologically) based individual differences in reactivity and self-regulation» (Rothbart & Derryberry, 1981). Accordingly, temperament plays an important role in the experience and expression of emotions, such as emotional reactivity and emotional (self-) regulation. Our presentation provides an overview of empirical studies from

our research laboratories that have focused on the association between temperament, emotion, and stuttering. Specifically, we focus on two distinct, but highly related, areas of research: temperamental characteristics and emotional processes. Specifically, we discuss findings (conducted by Dr. Kurt Eggers and collaborators) on temperamental characteristics associated with early developmental stuttering as well as the relation between anxiety and the impact of stuttering. We then provide an overview of research (conducted by Dr. Robin Jones and collaborators) on emotion-related physiological processes in developmental stuttering as well as the association between emotional processes and persistence and recovery. Building on these empirical findings, we provide takeaways from the growing body of published empirical studies as well as potential clinical implications to ponder for developmental stuttering.

## Definitions and descriptions of temperament and emotion

### *Temperament*

Rothbart's multidimensional temperament model defines temperament as constitutionally based individual differences in reactivity and self-regulation (Rothbart, 2011). *Constitutional* refers to the person's relatively enduring biological make-up, influenced over time by genetics, maturation, and experience. *Reactivity* refers to the arousability of motor, autonomic, cognitive, affective, and endocrine response systems and can be assessed through parameters like reaction threshold, latency, intensity, time to peak intensity, and recovery time. *Self-regulation* refers to those processes that can modulate (facilitate or inhibit) reactivity, such as attention shifting, behavioral inhibition, and withdrawal.

When a child is confronted with a stimulus, depending on several stimulus characteristics or child-specific factors, this stimulus might lead to either positive or negative reactivity within the child. With growing older, a child will be able to consciously modulate this reactivity by employing self-regulatory processes in order for the positive/negative reactivity to in-

crease or decrease, respectively. Children differ in reactive temperamental components but also in the ease with which self-regulation is initiated.

Temperament constellation thus plays an important role in the experience and expression of emotions (e.g., fear, anger, sadness, pleasure) and therefore the terms emotional reactivity (disposition to emotional, motor, and attentional reactions) and emotional (self-)regulation (processes that act on reactive tendencies, increasing or moderating them) are often used.

### *Emotion*

There is a set of basic emotions that are experienced by humans and observed in animals as well: happiness, surprise, anger, disgust, fear, and sadness. Other emotions result from a combination of these. Most agree that emotions are affective states involving multiple components such as physiological changes, feelings and thoughts, and expressive behaviors. Also, the American Psychological Association has defined emotion as «a complex reaction pattern, involving experiential, behavioral and physiological elements.» (Vandenbos, 2007). Emotional arousal can result in physiological changes such as heart rate changes, sweating, and pupil dilation, but can also result in different behavioral responses such as running, freezing, or facial expressions.

Since emotions and temperament are highly related to each other, also the approaches used to measure both dimensions overlap. Methods include self- or caregiver-reports, behavioral observations, and psychophysiological (i.e., autonomic and central nervous system activity) measures. Every method has its relative advantages and disadvantages.

### **Established and emerging themes of empirical investigations**

In the following section we provide a brief overview of the established and emerging themes of empirical research on the association between temperament, emotion, and developmental stuttering. For our review of temperamental characteristics in stuttering, we focus on the temperamental

characteristics that differ between young children who stutter (CWS) and children who do not stutter (CWNS) as well as their association with factors such as anxiety and the impact of stuttering for these children. Subsequently, we provide an overview of the physiological processes that have been studied relative to developmental stuttering as well as the association between emotional processes and persistence and recovery. It should be underscored that this brief review focuses on these specific areas of investigation and should not be viewed as a comprehensive review of the literature. For an in-depth, comprehensive review on temperament, emotion, and stuttering, please see review articles (Alm, 2014; Jones, Choi, et al., 2014; Kefalianos et al., 2012) as well as our recent book chapter (Jones et al., in press) on the topic.

#### *Temperamental characteristics associated with early developmental stuttering*

Our initial work was questionnaire-based and showed that CWS, as a group, scored higher on negative reactivity and lower on self-regulation (Eggers et al., 2010). Later studies primarily used behavioral (computer) paradigms focusing on different aspects of self-regulation. We have found that CWS were less efficient in inhibitory control (Eggers et al., 2012) and scored lower on attentional orienting (Eggers et al., 2013) and attentional set-shifting (Eggers & Jansson-Verkasalo, 2017). We have taken these findings to suggest a possible role for self-regulatory processes in developmental stuttering.

#### *The relation of temperament to anxiety and the impact of stuttering*

In a recent series of studies, we started to explore the associations between temperament constellation, anxiety and the impact of stuttering. Higher negative reactivity scores and lower positive reactivity and self-regulation scores were associated with elevated levels of anxiety and depression in CWS (Eggers et al., in review). Also, the impact that stuttering has on an individual is likely to be affected by temperament and one's ability to cope, since the experience of stressors and the ability to cope can directly

impact children's and adolescents' well-being. Children with higher positive reactivity scores, experienced a lower overall impact of their stuttering while children with higher negative reactivity, experienced a higher overall impact (Eggers et al., 2021).

### *The role of physiological processes in developmental stuttering*

To date, our research on psychophysiological measures of emotion has often been designed to examine whether young children who stutter exhibit heightened emotional reactivity and/or decreased regulation during emotionally-arousing conditions. We have found that young children who stutter, compared to children who do not stutter, exhibit heightened skin conductance (an index of sympathetic nervous system activity) during a narrative speaking task following a positive condition (Jones, Buhr, et al., 2014) as well as significantly greater LPP amplitude (an index of cortical reactivity) during viewing of unpleasant pictures (Zengin-Bolatkale et al., 2018). We have also found that decreased respiratory sinus arrhythmia (indexed by parasympathetic nervous system activity) is associated with increased stuttering frequency for children with low executive functions (Jones et al., 2017). Taken together, we have interpreted this work on psychophysiological measures to suggest that emotional reactivity and regulation are associated with developmental stuttering in young children.

### *Emotional processes and pathways of persistence and recovery*

We have also conducted studies to examine whether emotional processes are associated with stuttering persistence. In one of our recent longitudinal studies we found that children with persistent stuttering, compared to children who recovered, exhibited higher skin conductance level during a fast-paced picture naming task at the initial time point of our longitudinal study (Zengin-Bolatkale et al., 2018). We also found that children with persistent stuttering, compared to children who recover and those who do not stutter, exhibited significantly slower speaking rate fol-

lowing negative compared to neutral emotional conditions (Erdemir et al., 2018). These studies, albeit with small sample sizes, provide evidence that emotional processes relatively close to onset may be associated with later risk for stuttering persistence.

## **Conclusions and potential implications**

In general and based on an expanding body of research, we have found that temperament and emotion are associated with stuttering: (a) CWS were found to exhibit increased (physiological) reactivity (both positive and negative) and decreased self-regulation; (b) some, but not all studies, have found increased reactivity and decreased regulation are associated with increased stuttering for CWS; and (c) temperamental characteristics are associated with anxiety and increased negative impact of stuttering for CWS. Evidence seems to suggest that temperament and emotion play a salient role in the onset and development of stuttering for at least some people who stutter and should be considered in the comprehensive account of developmental stuttering.

Clinically, the present authors suggest that we should proceed with caution until the underlying mechanisms associated with temperament, emotions, and stuttering have been unraveled. Clinicians may use a variety of approaches to develop an understanding of a child's temperamental characteristics and parent-child goodness of fit. By understanding a child's temperament, clinicians may be able to suggest strategies that will optimize parent-child alliance (such as anticipating how a child will react in a given situation) as well as ideal problem solving/coping strategies to apply.

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## CONTRASTING VIEWPOINTS ABOUT CLINICAL MANAGEMENT OF PRESCHOOLERS WHO STUTTER

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### Introduction

In a recent publication (Onslow & Kelly, 2020), we, the authors, debated some issues with temperament during early stuttering and how it influences assessment and treatment procedures. In this presentation, we extend that debate in reference to a set of statements about clinical management of preschoolers who stutter.

### **Treatment goals for stuttering should focus primarily on communication quality rather than stuttering severity**

*Mark:* I think this is a dangerous idea. If early stuttering persists past the pre-school years, it could well become a communication disorder that lasts a lifetime. There is an overwhelming body of research evidence showing that, during a lifetime, it can cause mental health issues, and it can cause failure to attain full educational and occupational potential. Many randomised controlled trials and randomised clinical experiments have shown that early intervention can reduce stuttering severity by clinically significant amounts. These reductions are beyond what would occur with natural recovery, and they occur far more immediately than does natural recovery. A recent Cochrane review (Sjøstrand et al., 2021) confirmed these findings. In the face of this evidence, I do not understand why a clinician would not attempt to control the stuttering severity of pre-school children.

I am not sure what «communication quality» means, but, to my knowledge, there is no research evidence to guide clinical practice focusing on it. There is no evidence showing that the communication impairments of early stuttering extend to anything other than would be expected from the speech disruptions of early stuttering. And they can be effectively controlled according to the available evidence base (Sjøstrand et al., 2021). Clinicians may want to stray from the evidence underpinning treatment practices and focus treatment on a construct of «communication quality.» To do that, they would need to use their own clinical idea of what that «communication quality» means, and use whatever methods they choose for that treatment. But that would not be evidence-based practice. Again, I do not understand why a clinician would do this in the face of existing randomised trial evidence in favour of controlling early stuttering.

*Ellen:* The majority of preschoolers who stutter will naturally recover while a smaller proportion will persist. For those who recover, early intervention aims to help while they are stuttering, principally by working with parents to support their communication and/or speech fluency. The same may be said of those who ultimately persist, creating a communication environment and interactants (e.g., parents) who are knowledgeable, supportive (e.g., in advocacy), and empathic, positively addressing the potential impact of stuttering and the potential «failure» you describe. No approach (whether directed specifically at moments of (dis)fluency or towards positive, supportive parent-child communication interactions and support) appears to prevent chronicity for that smaller proportion. Even the Sjøstrand et al. (2021) review of randomised controlled trials of the Lidcombe Program (LP) noted that «results should be interpreted with caution due to the very low and moderate certainty of the evidence and the high risk of bias identified in the included studies» (p. 2). Thus, early intervention, for those who recover or persist, when focused on quality communication (i.e., focusing on content/message, turn-taking, empathic listening, advocacy, reassurance/support, etc.) benefits children and families in the short- and long-term. Over time, stuttering becomes about all the things people do, don't, and/or won't do in order to avoid and/or control stuttering. While we cannot «cure» stuttering, we can provide therapy that prevents stuttering from being a «communication disorder that lasts a lifetime» and, thus, positively impacts

quality of life. Resultantly, those who stutter persistently become quality communicators that happen to stutter (and they do so without tension and struggle and/or avoidance – but that’s a topic for another debate).

Potential anxiety in children and families should be routinely assessed for early stuttering

*Mark:* Presumably, «potential» anxiety refers to anxiety that does not yet exist. But how can you assess something that does not exist? And what is meant by «anxiety?» Does this refer to state anxiety or trait anxiety, or both? Does every family member need to be assessed for anxiety, or only selected ones? If every family member is assessed for anxiety, what is defined as a family member? Do regular visitors to the home, such as grandparents, need to be assessed for anxiety? And do all siblings need to be assessed? And if so, at what age do you or do you not assess a child for anxiety? (Presumably, a 16-month-old infant would not need to be assessed for anxiety.) Are all family members (whoever they are deemed to be) assessed individually for their «potential anxiety,» or are they assessed as an interactive family unit?

What strikes me about this statement is the sheer impossibility of the prospect of assessing the anxiety of all members of a family unit. Obviously, clinical assessment of anxiety for people of all ages, from infancy to adulthood, is within the domain of clinical psychologists, not speech pathologists. As any clinical psychologist will tell you, assessing the anxiety of an individual is not a simple matter of giving a test or two. You need to get to know the person during the course of a few clinical contacts.

Another aspect of this statement that strikes me is why a clinician would undertake such a massive anxiety assessment task when a family comes to a clinic complaining that a preschooler has begun to stutter. I could understand it if the presenting problem was anxiety, but not with a presenting problem of early stuttering. I look forward to Ellen’s clarification of that matter.

*Ellen:* Given the reported prevalence of social anxiety disorder in children, teens, and adults who stutter, examining the relation between risk, vulnerability, and protective factors in young children who stutter presents an opportunity to anticipate, address, and potentially prevent the development and/or impact of social anxiety on communication. As is true

for stuttering, social anxiety develops as a result of genetic, environmental, and epigenetic interactions. For example, less stress is needed to trigger symptoms of social anxiety in those who have greater genetic vulnerability for the disorder (Kertz et al., 2019). Further, social anxiety is influenced by others' perceptions and judgments and the individual's perceptions thereof. Additionally, data show stressors can exacerbate stuttering, as they do anxiety, and that preschoolers may have negative reactions to their stuttering that are influenced by risk factors for social anxiety (e.g., behavioural inhibition) (Ntourou et al., 2020). Risk factors for anxiety include genetic and temperament factors, cognitive aspects, parent-child interactions, and adverse environments. Utilising clinical intakes, interviews, and validated instruments to assess anxiety in the «family tree», as well as anxiety present in the child and/or for which the child is at risk, are important aspects of assessment that are ongoing throughout the therapeutic process. By assessing the presence and/or risk for (social) anxiety symptoms/disorder, we can design therapy plans that include attention to coping skills and positive environmental supports to address—and possibly prevent—social anxiety in those who stutter. How can one ignore temperament and risk for anxiety, believe that only psychologists can assess it, and yet claim that speech-language clinicians can understand it by getting «to know the person during the course of a few clinical contacts?»

### **Before treatment begins, assessment of temperament is essential**

*Mark:* I venture that this is a clinically futile pursuit. Once treatment has begun, if the clinician finds that some aspect of the child's temperament becomes important to the treatment process—either enhancing it or impeding it—then the clinical process will adapt according to that clinical experience. That is not rocket science, it is «Clinical Practice 101» in (hopefully) every tertiary institute that qualifies members of our profession to give treatment to children.

To reiterate my statement about this matter, which was presented in another forum (Onslow & Kelly, 2020), evidence-based practice involves «conscientious, explicit and judicious use of current best evidence in mak-

ing decisions about the care of individual patients» (Sackett et al., 1996, p. 71). With that in mind, I cannot, in all conscience, endorse comprehensive health resources applied to the onerous task of assessing early childhood temperament without any guiding evidence to do so. What would be the point of doing that? It is self-evident that any pre-schooler might have an unusual temperament. Therefore, some preschoolers who stutter might have an unusual temperament. And for them, it is also self evident that their unusual temperament might—or might not—have a negative impact on their treatment. In which case, as I stated above, clinicians can provide an appropriate clinical response. Why does it need to be any more complicated than that?

*Ellen:* The assertion being made is that it is not necessary to look at temperament, nor it's relation to anxiety and stuttering during initial assessment, but that these elements are somehow gleaned during the first few treatment sessions without the benefit of formal inquiry (e.g., by interviews, planned observations, and/or formal instruments, such as Rothbart's temperament questionnaires) and then easily integrated into therapy by anyone with the benefit of «Clinical Practice 101». This is counterintuitive at best. A comprehensive assessment (taking approximately three hours – hardly «onerous» or out of proportion to best practices) using the readily-available tools supported by research findings concerning the temperaments, attitudes, and presence/absence of stuttering in preschoolers (e.g., Tumanova et al., 2020) equips clinicians with robust client-centered data to aid selection from among treatment options and guide their subsequent implementation. Assessment is ongoing and modifications are made, as needed, to further maximise therapeutic outcomes. If, for example, a child tends to respond to correction by withdrawing, refusing to talk, and/or bursting into tears— as learned, in advance, from parent interview, observation, and/or completion of instruments (e.g., Rothbart's CBQ)—the clinician can utilise evidence-based practice (a combination of research findings, assessment data, and clinician experience, adapted to the uniqueness of each client in context) to proactively select an appropriate treatment method and implement it in a manner that best fits the child and family. Thus, if «Clinical Practice 101» includes attention to the need to assess the child who stutters in a manner most conducive to quality intervention and outcome as suggested

by ASHA's stuttering-focused adaptation of the International Classification of Functioning, Disability, and Health Model, then including temperament in assessment best prepares the clinician to do so.

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## STUTTERING IN YOUNG FEMALES AND MALES

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### ABSTRACT

Little is known about how the experience of stuttering relates to sex, and how the experience may change while growing up. To expand the empirical base, the present doctoral project aims to explore how stuttering impacts young males and females separately. Results suggest that female adolescents seem to be more negatively impacted by their stuttering and have a higher level of communication apprehension compared to age-matched males and typically fluent peers. The findings are an important contribution to the growing body of evidence that sex should be considered when evaluating the impact of stuttering.

### Objectives

It is not unusual for people who stutter (PWS) to hide or minimise moments of stuttering by speaking less or avoiding certain words or situations. Clinical experience and anecdotal evidence suggest that this coping strategy is more common in females (Constantino, Manning, & Nordstrom, 2017; Cheasman & Everard, 2013). Scientific findings supporting this claim are lacking, since there is a current paucity of research on females' experience of stuttering and their coping strategies. Possible differences between how females and males experience and cope with stuttering while growing up is to date also a largely unexplored area. Stuttering quite commonly occurs in the speech of children in their preschool years, with an incidence of



5 – 11% (Reilly et al., 2013; Yairi & Ambrose, 2005). Although males who stutter outnumber their female peers at all ages, the male-to-female stuttering ratio is less unbalanced for preschoolers (2:1) than for PWS in older ages (4:1) (Bloodstein & Bernstein Ratner, 2008; Yairi & Ambrose, 1992). These findings indicate that females are more likely to recover from stuttering than their male counterparts (Yairi & Ambrose, 2005). Although stuttering is more common in males, stuttering occurs in females as well. Still, few studies have explored the impact of the sex (or gender) of the person on the development of stuttering. In the general population, young females have been found to have lower self-esteem and higher levels of communication apprehension than males (Bleidorn et al., 2016; Tahir, Khor, Mozaka, Kayode, & Khan, 2017). More than twice as many 16-year-old girls as boys report psychosomatic problems (62% and 35%, respectively) (The Public Health Agency of Sweden, 2021). Hence, it is reasonable to assume that young females who stutter also experience more negative affective, behavioral, and cognitive reactions to their stuttering than young males. Knowledge about stuttering is mainly based on research where most of the participants are men. Results are usually reported at group levels and rarely for men and women separately (Nang, Milton, & Lau, 2018). This approach not only risks that possible differences that may exist between men and women remain unexplored, research results also risk being invalid for both females and males (Mauvais-Jarvis et al., 2020). Therefore, the overall aim of this doctoral project is to investigate possible differences in young women and men regarding their experience of stuttering and coping strategies while growing up.

## Methods

In three of the four studies in the project, data derived completely or partially from the self-reporting instrument the Overall Assessment of the Speaker's Experience of Stuttering (OASES, Yaruss & Quesal, 2016). This instrument provides a measure of how stuttering impacts the quality of life and comprehensively evaluates communication difficulties in various social contexts. Our first study aimed at investigating differences in the experi-

ence of stuttering and attitudes to communication in adolescent females (n=26) and males (n=30) who stutter (Samson et al., 2021). To check for gender differences regarding communication apprehension that may also exist among adolescents who do not stutter, an adaptation of the OASES was constructed: Attitude to Speech and Communication (ASC). ASC was administered to 126 females and 107 males. The impact scores from the obtained data were analysed in relation to sex in both groups. The second study in the project aimed at expanding the findings from the first study by exploring how sex impacts the experience of stuttering when potential differences in overt stuttering are checked for (Samson et al., 2021, under review). Data from 38 young PWS included the OASES, speech-language pathologists' (SLP) assessment of overt stuttering severity (SSI-3, Riley, 1994) and self-reported overt stuttering severity. The ratings of overt stuttering severity were compared and analysed in relation to OASES and the sex of the participants. In the third study (manuscript) we examined how stuttering impacted male and female PWS in ages from 7 – 30 years, again with data originating from the OASES, from a total of 162 PWS (54% males, 46% females). Here, the impact scores from the obtained data were analysed in relation to sex and age. The fourth study in the project (in progress) was a qualitative study, with in-depth interviews with women between the ages of 18 and 30 with self-reported overt stuttering. The purpose of the study was to explore the personal experiences of a small group of women who stutter covertly and to investigate the driving force behind why they have chosen this particular strategy.

## **Results**

The results from the studies completed so far indicate that adolescent females seem to be the most severely impacted by their stuttering, compared to age-matched males (Samson et al., 2021). Also, the results suggest that stuttering in adolescent females limit their communicative participation and that they withdraw from different social contexts to a greater extent than males. This difference does not seem to be caused by differences in severity of overt stuttering. Moreover, self-reports and instruments used by the SLPs

to evaluate overt stuttering seem to correspond with the perception young males have of their stuttering, but not young females (Samson et al., 2021, under review). Since the sex difference in attitude to communication was not as pronounced among typically fluent peers, the results indicate that females in their adolescence may be particularly vulnerable to the negative impact of stuttering.

## Conclusions

At a group level, stuttering seems to affect young females more negatively, when compared to males of the same age. Also, young females, compared to males, report that they have a more negative attitude towards communication in everyday situations and stronger negative emotional reactions to stuttering.

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*Session 2*

# **Aspects of childhood stuttering**

## **EARLY STUTTERING AND ANXIETY: PIECING TOGETHER THE EVIDENCE TO INFORM CLINICAL PRACTICE**

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### ABSTRACT

Anxiety is a common psychological concomitant of stuttering in adolescents and adults seeking stuttering treatment. Research exploring the relationship between anxiety and early stuttering however is less consistent. Consequently, best practice regarding assessment, identification, and management of anxious symptoms in preschool children who stutter (CWS) is not clear to speech language pathologists (SLPs).

Literature examining early stuttering and anxiety will be reviewed. Evidence from the only prospective longitudinal study to date indicates that anxious symptoms are not associated with stuttering onset. Anxiety therefore emerges in response to the experience of stuttering. While findings from community cohort studies remain inconclusive, two things are clear. Stuttering does not adversely affect every preschool CWS however

the potential psychological impact of stuttering can emerge close to onset. Preliminary evidence suggests that early stuttering interventions may be psychologically beneficial. Other clinical implications will be discussed. SLPs should screen all preschool CWS for anxious symptoms to ensure that the most appropriate treatment plan is implemented for each child to maximize stuttering and psychological outcomes.

## **Introduction**

There is unanimous agreement that anxiety is a common psychological concomitant of stuttering, particularly in adolescents and adults seeking stuttering treatment (Blumgart, Tran, & Craig, 2010; Iverach et al., 2009). Research exploring the relationship between anxiety and early stuttering is less consistent.

## **Stuttering onset and anxiety**

The Early Language in Victoria Stuttering Study (ELVS) remains the only study worldwide to have examined stuttering using a community cohort of preschool children recruited prior to stuttering onset (Reilly et al, 2009). When 1,619 children turned two years old, parents were asked to complete the approach/withdrawal items from the Short Temperament Scale (Sanson et al, 1994). Approach/withdrawal measures traits including shyness, withdrawal and inhibition which are precursors to the development of anxiety (Rapee & Spence, 2004). Evaluating these traits prior to stuttering onset allowed children's expression of these traits to be assessed before they could be influenced by the experience of stuttering. Results demonstrated no significant differences between children who subsequently started stuttering and those who never stuttered. This indicated that preschool CWS do not exhibit temperament precursors of anxiety prior to stuttering onset and therefore the anxiety experienced by people who stutter is not implicated in the cause of stuttering. Instead, anxiety emerges in response to the experience of stuttering. Naturally, the next question to arise from

this finding was how early anxious symptoms can begin to emerge in the development of stuttering.

### **Emergence of anxious symptoms during early stuttering**

To date, three population-based studies have explored the emergence of anxious symptoms during stuttering but have reported conflicting findings. In ELVS, the approach/withdrawal items of the Short Temperament Scale were measured at four and seven years of age. Additionally, the Strengths and Difficulties Questionnaire (Goodman, 1997) and Pediatric Quality of Life Inventory Parent-Proxy Report (Varni, Seid & Rode, 1999) were administered to evaluate behavioral and emotional difficulties and health related quality of life respectively. At both ages, there was no evidence of differences between children who had been confirmed as starting to stutter by four years of age and non stuttering children, indicating that the adverse effects of stuttering are not generally experienced by preschool children (Reilly et al, 2013 & Kefalianos et al, 2017).

Findings from two other population-level studies, however, have reported that preschool children can develop anxious symptoms shortly after stuttering onset. McAllister (2016) used the Strengths and Difficulties Questionnaire to evaluate the impact of stuttering in a community cohort of more than 12,000 children. McAllister reported significant differences between stuttering and nonstuttering children's emotional and behavioral development from three years of age. Using a short version of the Strengths and Difficulties Questionnaire with a community cohort of 144 children who were reported to stutter and 7,171 non stuttering children, Briley and colleagues (2019) found that 4-5 years old children who stuttered were more likely to be reported to be unhappy, to worry and to have emotional difficulties compared to their non stuttering peers. Outcomes from these latter studies indicated that preschool children can develop anxious symptoms close to stuttering onset. While reasons for these conflicting outcomes are not clear, the key messages derived from these findings are. Anxious symptoms do not develop in every preschool CWS. Management of anxious symptoms does not therefore need to be part of standard practice when



working with preschool CWS. The fact that anxious symptoms can develop close to stuttering onset, however, highlights the need for all CWS to be screened for these behaviors so that children exhibiting anxious symptoms can be identified and managed promptly.

### **Behavioral markers of anxious symptoms during early stuttering**

Langevin and colleagues (2009; 2010) investigated parent perceptions about the impact of stuttering on 3–6-year-old children. Negative impacts reported included children becoming frustrated about their stuttering, withdrawing, reducing their verbal output and making negative comments about their ability to speak. These reactions, particularly of withdrawal and talking less, can be considered as avoidance behaviors symptomatic of early anxiety development.

### **Early stuttering intervention and anxiety**

When the first clinical trial of the Lidcombe Program was published, apprehension was created about the programs' psychological safety. Researchers responded by conducting a trial to evaluate the psychological effects of the treatment (Woods et al, 2002). The parents of eight preschool children completed the Child Behavior Checklist, which evaluates psychological wellbeing, prior to their child starting treatment, whilst completing treatment, and one month after finishing treatment. Evidence demonstrated that not only was the Lidcombe Program psychologically safe, but that it may even be psychologically beneficial as reduced levels of anxiety were observed post treatment. In another trial, the psychological safety of the Lidcombe and RESTART programs was compared (De Sonnevile-Koedoot et al, 2015). Based on outcomes from a randomized controlled trial which involved 200 CWS, there was no evidence of children becoming more anxious irrespective of whether they received the RESTART program or Lidcombe Program. In fact, there was evidence of improved scores on the Child Behavior Checklist and KiddyCAT post treatment indicating

improved psychological wellbeing and communication attitudes. Based on the limited research that has been conducted to date, it appears that early stuttering intervention is psychologically safe to administer and may facilitate the resolve of anxious symptoms.

### **Clinical implications for the management of anxious symptoms**

Considering the interplay between anxiety and early stuttering, it is imperative that SLPs have effective and thorough practices in place to identify and subsequently manage children with even the most subtle of anxious symptoms.

Collecting a case history provides SLPs with the opportunity to gather initial information and provides a platform for parents to share concerns about their child. Some of the following questions may assist an SLP to identify avoidant behaviours that suggest a child is showing anxious symptoms and further investigation is warranted.

- How does your child react when they stutter?
- Does your child comment on their talking?
- Has your child's behavior changed since they started stuttering?

If further assessment is indicated, the Preschool Anxiety Scale may be used to further evaluate the presence of anxious symptoms. It is a parent report measure and anxiety screening tool that indicates whether further formal assessment of anxious symptoms by a psychologist is needed. The scale consists of 34 items that provide an overall measure of anxiety as well as scores for six subscales which measure different aspects of child anxiety including social anxiety.

Informational counselling is typically provided after an initial assessment. This is an invaluable opportunity to educate parents about the interplay between anxiety and stuttering as this knowledge can influence their beliefs about how stuttering should be treated. SLPs can:

- reassure parents that stuttering is not caused by anxiety
- explain that anxiety can exacerbate stuttering symptoms
- educate parents about anxious symptoms so that they can monitor the development of these reactions in their child

- prompt parents to be aware of how the child's siblings, peers and other family members respond to stuttering so that these reactions can be identified and managed promptly

When assessment indicates that a CWS has developed anxious symptoms, the first critical step is to treat stuttering with an evidence-based treatment. There is compelling evidence that many children are exposed to negative social interactions as a direct consequence of stuttering (Langevin et al, 2009; 2010). Early intervention may therefore reduce the number of negative social exposures these children encounter.

Children identified as having heightened anxious symptoms should be referred to a psychologist so that they can receive the expert care required to address the anxieties that they have. For many children who exhibit anxious symptoms, however, referral to a psychologist will not be necessary. Firstly, there is preliminary evidence that early stuttering interventions may alleviate anxious symptoms (Woods et al, 2002 & De Sonnevile-Koedoot et al, 2015).

However, given this evidence is founded from limited data, it is also possible that stuttering interventions may not be sufficient for some children to manage anxious symptoms. In these cases, it may be necessary but sufficient for SLPs to provide strategies to address a child's emotional, cognitive, and behavioral reactions to stuttering. These strategies are designed to reduce the child's negative beliefs and build their self-confidence. Advise parents to:

- incrementally expose their child to tasks or settings that their child perceives as difficult to build their confidence gradually.
- reinforce instances when their child is naturally brave.
- focus on the child's other strengths.

Finally, educate parents about strategies to avoid which can maintain a child's anxiety. Excessively reassuring a child may make them worry that a situation is dangerous. Similarly, being permitted to avoid a situation gives a child temporary relief that may sustain their anxiety.

## **Conclusions**

Extensive research has advanced our knowledge about the relationship between anxiety and early stuttering. Stuttering does not adversely affect

every preschool child who stutters. However, the risks of early stuttering are real, serious, and can last a lifetime. SLPs have a responsibility to ensure that every young CWS is screened for anxious symptoms during initial consultations to ensure that the most appropriate treatment plan can be implemented for each child to maximize stuttering and psychological outcomes.

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## **THE IMPORTANCE OF DATA BANKING FOR STUTTERING RESEARCH AND CLINICAL PRACTICE**

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### ABSTRACT

We discuss the motivation for establishing FluencyBank, an international, free repository for expressive language data obtained in stuttering research/practice as well as fluency in other populations. We update the current resources (corpora and software) available to users. In addition to research data, FluencyBank also hosts an active teaching site with interviews from adults and children who stutter/clutter. We describe published research using FluencyBank since its inception in 2017, and project future needs and anticipated benefits to the stuttering community.

### **Background**

Open-access archival storage of scientifically important data sets has a durable history in the fields of child language acquisition and disorders, aphasia research, and other fields related to communication sciences and disorders, such as second language acquisition. Beginning with the construction of the Child Language Data Exchange System (CHILDES) in 1985, data-sharing plans permitting cloud-based access to speech and language

data has grown from a desirable option that can increase the potential of both basic and translational research to a federal mandate enforced by numerous granting agencies, particularly in the United States. Currently, numerous specialized archives, each focusing on a conceptual theme in human communicative behavior, are joined together under an umbrella organization known as TalkBank ([talkbank.org](http://talkbank.org)).

Until the advent of FluencyBank, efforts to archive and share data collected in the study of typical and disordered fluency were stymied by a number of obstacles. A first was the absence of transcription conventions for disfluencies that could be applied across differing orthographies and transparently interpreted to convey the actual speaker's production in an unambiguous way. A second was the specialized need for transcripts of speech disfluencies to be accompanied by and ideally linked to, the actual audio- or video-recorded media; annotation of fluency behaviors is notoriously unreliable (e.g., Cordes & Ingham, 1994). A third obstacle was a lack of community awareness of options for data sharing. Although similar initiatives had been available for researchers in other domains for over three decades, there was little community culture in fluency disorders to collect and share data for use by researchers outside the originating lab. An exception was UCL's UCLASS (Howell, et al., 2007); however, this initiative posted only a single data set, and is no longer maintained for public use.

Thanks to funding provided by the US NIH and NSF (see Acknowledgments), FluencyBank «went live» in early 2017. Here, we describe the current holdings of FluencyBank, its coding conventions, current work being conducted using FluencyBank utilities, and future promise of FluencyBank to address major questions in speech fluency profiles and disorders.

### **Aims of fluency bank**

Small N studies are a widespread feature of research in stuttering, as are studies that rely on the expertise of only one or two researchers at a given study site. As with other Banks, FluencyBank aims to preserve historically important data (rather than have it destroyed when PIs retire), as well as deploy its usage in ways not necessarily envisioned by the original researchers

(for an example of this, see the section on current usage by speech assistant programmers). As another example, while parental advisement to Children who Stutter (CWS) is frequent, few of the studies that have contributed parent-child interaction samples to FluencyBank transcribed parents' speech: their focus was only on the child's speech and language skills (the grants are currently filling in these missing transcript data from the historic Illinois Stuttering Research Project, ISRP).

To achieve goals of re-analysis and combining individual study data to achieve greater power and reliability, an aim of the Banks was to develop and promulgate uniform transcription (see <https://talkbank.org/manuals/Clin-CLAN.pdf> that can be employed across languages and orthographies (e.g., *pro* for prolongation is somewhat linguacentric) and allow the user to recreate the moment of disfluency without too much ambiguity, while allowing the same transcript to be processed for its syntactic, morphological, phonological, and interactional properties. Prior fluency coding has been highly idiosyncratic across laboratories, which obstructs data sharing. Extended further, uniform transcription and coding enables development of free software tools that can operate across data from numerous labs worldwide and over time.

### Fluencybank tools and resources

Since its first full year of funding in 2017, FluencyBank has recruited, re-coded, and curated 15 research corpora with data from over *400 speakers, totaling ~3000 transcripts and 95 GB of media* (all of these numbers exclude its teaching resources and some data sets in stages of conversion not yet ready for posting). These data represent speakers from multiple languages (e.g., English, Spanish, French, Dutch, German, Polish [in progress]), as well as multiple age groups and conditions (e.g., fluency coded data are available for Children with Down Syndrome, second language learners, bilingual preschool children, etc.). Its rate of growth exceeds that for the first funding cycles of other Banks, which now host enormous numbers of corpora, languages and population characteristics. For instance, after 25 years, CHILDES (the first TalkBank) had more than 50 million words in



its holdings from 34 different language communities, over 6000 papers that made use of its primary data in new analyses, and recorded over 2.5 million hits to its corpora locations. TalkBank repositories are now the acknowledged data-sharing plan destination of most of the completed research work in language worldwide. That is the scope to which we aspire.

With the development of cross-linguistically applicable fluency codes for stutterlike disfluencies (SLDs), TalkBank was able to develop free software to compute numerous fluency features of appropriately transcribed corpora (the CLAN program FluCalc, freely available at TalkBank.org for PC, Mac platforms and Unix). Spreadsheet output includes raw counts and proportions (over words or syllables) of a wide array of typical and atypical fluency behaviors, as well as a weighted dysfluency score, and analysis of TD/SLD ratios as well as distributional loci of disfluencies on content vs. function words. Instruction tutorials use the system to transcribe, code, and analyze samples (for both fluency and language variables) and are available at <https://talkbank.org/screencasts/OSLP/>. The system will work fully for any of the 11 languages for which CLAN has a MOR grammar; work-arounds are available to perform fluency analysis (without language analysis) for other languages.

### *Clinical, teaching and accessibility activities*

A primary goal of FluencyBank, even before obstacles to clinical education posed by Covid-19, was exposing clinicians-in-training to greater experience working with individuals with fluency disorders. With the assistance of the American National Stuttering Association, Friends, Stuttering Therapy Resources/J. Scott Yaruss and the International Cluttering Association, we have developed protocols and collected samples from roughly 36 adults who stutter, a dozen children who stutter and a small number of adults who clutter. All interviews use a standard set of questions customized for disorder and age, accompanied, in most cases, by a reading sample and an OASES appropriate to age. These materials enable students to practice scoring a fluency sample and analyzing it, gain understanding of the cognitive and affective aspects of stuttering, score an OASES and conduct an evaluation

using the Stuttering Severity Instrument. Other activities and other teaching videos are available at <https://fluency.talkbank.org/teaching/>. We want to emphasize that all materials are free and completely open-access, and do not require passwords or registration to use (this applies to both teachers and students.) During the pandemic, we have received large numbers of thanks from University-based instructors who were unable to expose students to in-person fluency clients. At a recent self-help conference, we were also made aware that some SLPs are encouraging clients to view the interviews, as a way of addressing feelings of isolation. These SLPs report benefits expressed by clients, such as «I thought I was alone in feeling this way, until I listened to others who have experienced the same problems that I do.» We continue to welcome contributions to the teaching site (both video cases or illustration of therapy techniques) as well as teaching activities.

### *Research using FluencyBank data and resources*

Although FluencyBank is the newest TalkBank initiative, publications based on its primary research data holdings are already on track to meet and even exceed other Banks' use by researchers. In tracking use, we have ascertained that it falls into two major categories. Some, as expected, utilize contributed data to further understanding of stuttering, such as predictors of persistence and recovery in young children (e.g., using the Illinois, Purdue, Bernstein Ratner and other corpora for larger N analysis). Examples of such work include Leech, et al. (2017, 2019), Luckman, et al. (2020) and Hsu, et al. (in review). Fluency in bilingualism has been discussed by Smith, et al. (2020) and Brundage & Rowe (2018). Other work has addressed fluency profiles as important contributors to diagnosis of degenerative diseases in adults (e.g., LaSalle, 2017; Faroqi-Shah et al., 2020 and da Silva Genest et al., 2017).

A less-expected but frequent use of FluencyBank holdings in the past five years has been by speech recognition algorithm developers; as of the writing of this chapter, we could easily identify (using Google Scholar) 10 separate publications that have tested speech assistant software for ability to respond accurately to speakers who stutter, a major consumer need (Adams, 2021).

## Conclusions

Although, historically, TalkBank sites have started by curating archival data, their durable success requires uptake by researchers conducting prospective data collection. In this regard, we are gratified that a large number of NIH grant recipients have notified us that they will use FluencyBank to satisfy US federal mandates for data sharing plans in order to receive research funding (e.g., Maguire, et al., in progress). Prospective collection should be guided by appropriate informed consent gathered from participants. Sample consent forms and discussion are available at <https://talkbank.org/share/contrib.html> We note that all contributing researchers receive a unique web site and digital object identifier (doi) to describe their work, and to specify appropriate citation to the data if used in published research. To date, all such use has been acknowledged appropriately, as has been the experience for other TalkBank projects over the past four decades. The references list a sampling of these publications.

FluencyBank is in great need of contributions in languages other than English, as well as other fluency disorders/profiles (e.g., cluttering, neurogenic disfluency). This need encompasses both the research as well as teaching portions of the site. We welcome discussion with potential contributors.

A field needs to safeguard and curate major data critical to changes in relevant scientific knowledge. Further, work that has depended upon small-N studies for the majority of its published science can benefit from data-sharing, using common coding conventions, and resulting software analysis capacity, to achieve appropriate power in research investigations. Data banking also permits replication of research methods and findings. FluencyBank aspires to aid fluency researchers in achieving these goals.

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## INTERACT PROGRAM: CHANGING STUTTERING ATTITUDES IN YOUNG CHILDREN

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### ABSTRACT

Emerging evidence suggests that a stuttering stereotype exists among young, non stuttering children cross-culturally. Accordingly, there is a need to educate non stuttering children about how to be allies for peers who stutter to prevent teasing, bullying, or social distancing. The *Attitude Change and Tolerance (InterACT)* program can be used to improve children's knowledge about stuttering and teach skills for interacting with peers who stutter. This paper details the components of the *InterACT* program and its efficacy based on studies conducted in the United States and Poland. Practical recommendations about implementing the program using a top-down approach are offered.

### Background

#### *Children's Stuttering Attitudes*

For over a decade, stuttering attitude research among the general adult population has confirmed negative or uninformed stuttering attitudes (St. Louis, 2015). Measuring children's stuttering attitudes has become a comparatively newer extension of this line of research, with compelling evidence to support the notion that negative stuttering attitudes emerge during early development. In 2014, Weidner & St. Louis developed a standard attitude measure, the *Public Opinion Survey on Human Attributes–Stuttering/Child (POSHA–S/Child)*, to objectively measure stuttering knowledge, beliefs, and reactions among children 3 to 11 years of age. The survey aligns with the established and widely used *POSHA–S* (St. Louis, 2011) which is the leading

instrument for global measurement and comparison. The *POSHA-S/Child* has been translated and used in several countries, including: the United States (US), Turkey, Bosnia & Herzegovina (B&H), and Poland. The inaugural study in the US showed that preschool children had worse overall stuttering attitudes than kindergarten children, with both groups holding negative attitudes toward stuttering as a condition (Weidner, St. Louis, Burgess, & LeMasters, 2015). Preschool attitudes among Turkish children were nearly identical to that of the US group, which further suggested the emergence of stuttering attitudes at a young age (Weidner, St. Louis, Nakıscı, & Özdemir, 2017). Subsequent studies increased the age of inclusion to examine if and how attitudes changed during early childhood. In the US, cohorts of kindergarten through fifth grade children participated (Glover, St. Louis, & Weidner, 2019). Results showed an almost linear improvement in ages during that time, with some fluctuations. A replication study in B&H with preschool through sixth-grade children echoed the US results, with the youngest cohorts holding the least informed or most negative stuttering attitudes (Weidner, Junuzović-Žunić, & St. Louis, 2020).

Compelled by those findings, Weidner (2015) developed *The Attitude Change and Tolerance (InterACT)* program to address non stuttering children's gaps relative to their knowledge and skills when interacting with a person who stutters. The short-term aim of the program is to empower young children to be sensitive allies toward their peers who stutter to create a positive communication environment. Ultimately, the long-term goal is to prevent negative social consequences for people who stutter, such as social distancing, teasing, and bullying, which frequently occur among people who stutter (e.g., Beilby, Byrnes, & Yaruss, 2012; Blood & Blood, 2016; Langevin, 2015). The purpose of this paper is to provide a detailed overview of the program, its efficacy to date, and recommendations on how to achieve widespread attitude change through systematic training and program implementation.

### **The interact program**

The *InterACT* program is a puppetry-based educational series that teaches children about stuttering in the context of other human differences.

It consists of two 30-minute lessons, designed to be delivered face-to-face in small or large group settings. Each lesson is conducted in three consecutive parts: a 10-minute pre-recorded puppetry video, followed by small group discussion facilitated by a speech-language pathologist or other trained professional, and concludes with an activity book which the child can take home upon completion of the lessons. In addition, it also includes a theme song promoting prosocial themes such as «everyone is different, and everyone's the same.»

The characters in the videos, lifelike stage puppets, are intended to represent young children. One boy character stutters, one female character is in a wheelchair, and the other characters are otherwise typically developed. The scenes feature children in common universal settings, including at a park, in a school, and in a store. The script is void of slang and cultural references, which makes it easily translatable. The content of the video scenes focuses on various themes, including: the basic concept of same and different, similarities and differences in human attributes, specific information about stuttering characteristics and causes, unhelpful and helpful listener reactions when talking to a person who stutters, and acceptance of others. The semi-structured discussion allows the facilitator to highlight important themes from the videos and thus, increase participants' active learning. The facilitator displays a series of enlarged still shot pictures from the video and engages the children in a guided discussion. For example, in the scene in which the stuttering character was teased, the facilitator shows the picture and states, «In this scene, Hannah was not helpful with Ben's stuttering. What did she do that was not helpful?» Once the discussion is complete, the children complete select pages of their activity book. The book contains coloring page versions of the video characters as well as blank pages with a prompt such as «draw how you would interact with someone who is different.» Overall, the program is uplifting, spirited, and engaging for young children.

The *InterACT* program was first tried among 37 non stuttering preschool children in the United States using the *POSHA-S/Child* as the pre-post measure (Weidner, St. Louis, & Glover, 2018). A replica study was subsequently carried out in Poland among 43 non stuttering preschool and first-grade children, given the well-established literature related to



stuttering attitudes and practices in that country (e.g., Przepiórka, Błachnio, St. Louis, & Woźniak, 2013; Węsierska, Błachnio, Przepiórka, & St. Louis, 2016; Węsierska, Laszczyńska, & Pakura, 2017; Węsierska & St. Louis, 2014; Węsierska, St. Louis, Węsierska, & Porwoł, 2021). Collective results from those studies revealed compelling evidence to improve overall stuttering attitudes in children. Interestingly, pre and post results from the two countries were quite similar. Specifically, children's attitudes improved relative to their understanding of stuttering causes and helpful and unhelpful stuttering supports. Children indicated they would be patient, not laugh, and allow people who stutter to finish their words. Overall, results support the clinical utility of the program among young children to improve their stuttering knowledge and skills. Procedures for how the Polish translations, recruitment, and implementation were carried out follow.

### **Polish extensions and recommendations for widespread use**

The procedures to implement the program in Poland first involved translating the *POSHA-S/Child* and *InterACT* program. Back-translation procedures were conducted by speakers fluent in both Polish and English. To achieve this, the Polish team (the second author and Speech-Language Therapy students from the University of Silesia) directly translated the written survey and the stimulus video. The *InterACT* video scripts were translated verbatim, recorded by native Polish speakers, and dubbed over the original video. The activity book text was also translated. All visual components of the program (the video, the activity book) remained the same as the original version.

After the translation procedures were complete, each member of the Polish team completed a 90-minute training to learn appropriate administration procedures for the *POSHA-S/Ch* and *InterACT* program. The Polish study sites included two public institutions. As with the American study, the pre- and post- *POSHA-S/Child* as well as the *InterACT* program were delivered face-to-face. The survey was carried out one-on-one, and the lessons were carried out in a group setting. From start to finish, the program (including pre- and post- measures) took approximately four weeks.

Based on the positive results and feedback from implementing the program in the two Polish schools, it was determined that a «top-down» approach should be considered to create the most widespread change possible. The second author conceptualized and actualized a procedure for professionals (teachers, SLTs, etc.) to easily implement the program in their educational institutions throughout Poland. To achieve this, both authors agreed to make the Polish *InterACT* lessons freely available to professionals, contingent on the completion of brief training. The LOGOLab, an initiative aimed to improve the quality of stuttering intervention in Poland, was identified as a practical modality to disseminate the information related to the *InterACT* program. The Norwegian grants subsidize the LOGOLab project. Three partner institutions are implementing it: the University of Silesia in Katowice, the Agere Aude Foundation of Knowledge and Social Dialogue, and the Arctic University of Norway in Tromsø. All the *InterACT* program materials were made available to attendees through the LOGOLab website ([www.logolab.edu.pl](http://www.logolab.edu.pl)).

The first author recorded a brief introductory video, edited with Polish subtitles, about the program and provided an overview of stuttering. With the assistance of University of Silesia SLT students, the second author then developed a 90-minute webinar for professionals interested in the program. The training included: detailed «how-to» instructions for program implementation, a promotional poster and a leaflet for parents with a consent form, diplomas for children who participate in the *InterACT* program, and certificates for those who implement it. The virtual training, which commenced in November 2020, has been offered eight times to date. To date there have been 135 participants consisting of Polish teachers, SLTs, SLT students, as well as SLTs from other neighboring countries who understand the Polish language.

At this time, the *InterACT* program has been implemented in 15 educational institutions in Poland, with positive results. In addition, 70 webinar attendees completed an opinion survey about the *InterACT* program and its dissemination in Poland. Items were rated on a 1-5 Likert scale, with higher scores indicating «definitely yes.» Seventy-three percent of respondents gave the highest rating for the quality of the program itself, and nearly 85% of participants indicated they «would recommend the *InterACT* program to friends.» Open-ended feedback revealed the uniqueness of the program

and ease of implementation. Additionally, respondents reacted positively to the program's potential to improve social awareness and general attitudes toward stuttering. In addition, university students involved in the program implementation highlighted the importance of the program's mission and gained valuable experiences cooperating with other specialists.

## Conclusions

The *InterACT* program is an example of the holistic model of logopedic intervention, with compelling efficacy to support its use in educational settings. It is a form of primary and tertiary preventive intervention aimed at creating positive social attitudes toward stuttering and other human differences with the long-term goal of preventing negative social consequences. In addition, it has the potential to be used in the academic education of future speech-language therapists to teach advocacy and interprofessional practices. The program's success in Poland is mainly due to its universal prosocial message, free availability in an open-access form, ease of implementation, and data supporting its efficacy. The authors encourage the continued use of the program to create widespread improvement of public attitudes worldwide.

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**INVESTIGATIONS ON RELATIONSHIPS AMONG COMMUNICATIVE ATTITUDE, LINGUISTIC PROFICIENCY AND SEVERITY IN A SAMPLE OF PRE-SCHOOL CHILDREN WHO STUTTER**

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ABSTRACT

It is known that communicative attitude (CA) tends to be more negative in children who stutter (CWS) compared to their non-stuttering peers starting in preschool age and that a negative CA can be associated with other linguistic disorders. This study aims to investigate possible correlations among stuttering severity, communicative attitude, and speech and language proficiency in CWS. It is further assumed that CWS could develop a negative CA not only because of fluency problems but as a result of other speech and language difficulties they might have. The study involved 16 CWS (age range: 4;0 - 6;11). The BVL 4-12 was used in order to assess CWS for language and speech skills, and the KiddyCAT for their speech-associated attitude. Results showed a substantial similarity between the speech and language skills of CWS and the normative sample, with the possible exception of the task of articulation (in the naming test) and the repetition task (in the non-word, word, and phrase repetition tests). No significant correlations were found between CA and stuttering severity nor between CA and speech and language skills.

**Framework**

It is known that CWS can be aware of their difficulty with speech starting in the preschool years (Ambrose & Yairi, 1994; Ezrati-Vinacour, Platzky & Yairi, 2001), and possibly this awareness contributes to the development of a negative attitude towards one's own speech (Groner, Walden & Jones, 2016). As a matter

of fact, CA tends to be more negative in CWS compared to their non-stuttering peers starting at the preschool age (Clark, Conture, Frankel & Walden, 2012; Guttormsen, Kefalianos & Naess, 2015). According to some authors, a negative CA increases with both severity (Beilby, Byrnes & Yaruss, 2012; Kawai, Healey, Nagasawa & Vanryckeghem, 2012) and time elapsed from the onset (Guttormsen et al. 2015). Although there is wide consensus that stuttering is a dynamic and complex neurodevelopmental disorder that affects speech motor control and coordination (Smith & Weber, 2017; Nippold, 2018), and speech sound disorders reportedly co-occur in young CWS at a substantial rate (Gregg & Yairi, 2007), according to some authors most of CWS even show subtle differences in linguistic skills compared to their non stuttering peers (Ntourou, Conture & Lipsey, 2011). A survey composed by questionnaires compiled by SPLs showed that CWS suffer from a higher rate of comorbidity with other speech and language disorders than CWNS (Arndt & Healey, 2001; Blood, Ridenour, Quallas & Hammer, 2003). As a final consideration, it is also known that a negative CA may be associated with other speech and (possibly) language disorders (De Nil & Brutten, 1990; Havstam et al., 2011; McCormack, McLeod & Crowe, 2019).

## **Objectives**

This study aims at investigating possible correlations among communicative attitude, stuttering severity, and linguistic skills in preschool children, and secondarily to verify a possible positive correlation with the amount of time spent as a stutterer. Therefore, we assume that CWS could develop a negative CA not only because of fluency problems but as a result of other speech and language difficulties they might have, although not necessarily of clinical relevance, and that negative CA could increase together with age and the amount of time elapsed from stuttering onset.

## **Methods**

The study involved 16 children (14 males, 2 females) aged between 4 years, zero months and 6 years, 11 months, diagnosed as stutterers

but not yet treated (the majority), or treated for a maximum of three sessions. They were Italian monolingual, living in Veneto, without other concomitant disorders. They started to stutter at a mean age of 40 months (SD 16 months), and the first recording was made, as average, almost two years after their reported onset (SD = 19 months). The SSI-4 (Riley, 2009) was used in order to assess stuttering severity, the BVL 4-12 (a battery with a wide coverage for children aged 4 to 12 years, Marini, Marotta, Bulgheroni & Fabbro, 2015), for language and speech skills assessment, and the KiddyCAT (Vanryckeghem & Brutten, 2007), for the evaluation of the CA. In particular, BVL 4-12 includes 18 norm-referenced standardized tests, assessing speech and language production, perception and comprehension. In addition, parents completed a questionnaire about the subjects' medical history, linguistic profile, and other socio-economic information about the family. The tests were administered to each child through two sessions lasting about one hour each, at the child's home or in the office of his/her speech therapist. All meetings were audio and video-recorded. As a term of comparison, we used the normative samples provided by a preliminary Italian adaptation of KiddyCAT (Bernardini, Cocco, Zmarich, Natarelli & Vanryckeghem, 2019) and the normative samples provided by the BVL 4-12. As to the stuttering severity level, there were 3 severe, 7 moderate and 6 mild subjects.

## Results

The average score on the KiddyCAT test was 2.88 (SD = 2.39). As a term of comparison, the CWS' mean in Bernardini et al. (2019) is 5.32 (SD = 2.35) and the CWNS' mean is 2.30 (SD = 1.72). As one can see, the mean of the subjects in the present study was closer to CWNS' mean than to CWS' mean. Only 4 children out of 16 obtained a score that is indicative of a negative CA. Further, we wanted to verify a possible association between CA and age, and between CA and the temporal interval from stuttering onset to the first recording. Since the sample was small, the Spearman rank-correlation index *R* was chosen, which represents a



non-parametric measure of correlation. No correlations were statistically significant ( $p = 0.05$ ).

As regards to the speech and language skills, all cautions were taken in order to exclude the fluency difficulties from the calculation of the scoring. For instance, thanks to the suggestions of the first author of the battery (A. Marini, personal communication), we did not take into account all time delays possibly derived by the presence of stuttering-like dysfluencies, in those tests where time is an important variable. Looking to the results in a global view, by comparing the performances of each subject to each test of the battery to the normative sample in terms of z-scores, the majority of the participants obtained scores that fell within the average expected for their age (between -1 SD and +1 SD, see Table 1).

<b>&lt; -2</b>	<b>-2 ≤ SD &lt; -1</b>	<b>-1 ≤ SD ≤ 1</b>	<b>1 &lt; SD ≤ 2</b>	<b>&gt;2</b>
8.16%	13.83%	68.79%	7.80%	1.42%

*Table 1: Sampling distribution (in %) of the CWS with respect to normal distribution (averaged standardized scores at BVL 4-12 TESTS)*

The sections in which a substantial percentage of children (>30%) ranked below one SD were: «Articulation» (amounts of mispronounced words in a naming test), «Narrative Fluency» (a composite assessment involving the description of a short story elicited through a series of illustrations), «Grammatical decision» (involving the evaluation of the grammatical acceptability of a clause), and «Repetition» (where we summed up the results of the word and the non-word repetition, and the phrase repetition tests). In particular, in the tasks involving repetition, no subject achieved performance above the norm. Scores lower than -1 SD were obtained by 7 subjects out of 16 in the word repetition test, by 6 subjects in the nonword repetition test, and by 7 subjects in the sentence repetition test. Adding to this, in the Articulation test, 25% of the subjects obtained a score lower than -2 SD.

Since several studies have shown a high probability of CWS, compared to CWNS, manifesting discrepancies among different speech and language domains (e.g., Anderson et al., 2005; Hollister et al., 2017),

we tried to investigate the presence of dissociations between the scores of selected pairs of tests within the BVL 4-12 battery. Wilcoxon's non-parametric test was used, which is suitable for small groups of subjects that do not have a normal distribution, on the BVL 4-12 test scores as expressed in standard deviations. Since the literature shows the presence of dissociations between the receptive linguistic domain and the expressive one in the CWS (Hollister et al., 2017), we carried out the pairwise test between the average scores of the performances in all the tests attributable to «Comprehension» and the average scores of the performances in all the tests attributable to «Production», but we did not find a statistically significant difference between the two means ( $p = 0.05$ ). The discrepancy between the receptive and expressive vocabulary was then investigated by carrying out the test between the Lexical Comprehension test, and the Naming and Semantic Fluency tests, respectively: a significant difference was found between the mean of the Lexical Comprehension ( $M = -0.23$ ;  $SD = 0.85$ ) and that of Semantic fluency ( $M = 0.70$ ;  $SD = 1.20$ ), with a  $p < 0.05$  and a good effect size (rank correlation = .69).

Subsequently, we wanted to ascertain whether any significant relationships were existent between some particular speech or language ability and CA or stuttering severity. In order to do so, the raw score of each subject from every single test of BVL 4-12 was separately correlated to KiddyCAT scores or SSI-4 raw scores using the Spearman rank-correlation index R. No correlations were statistically significant ( $p = 0.05$ ).

Finally, we tried to ascertain whether there were any significant relationships among CA, stuttering severity, and linguistic proficiency. In order to investigate the relationships between CA and stuttering severity, the raw scores of the SSI-4 were correlated with the KiddyCAT scores. Results did not reveal any significant correlation ( $p = 0.05$ ). In order to investigate the relationships between linguistic proficiency and CA, as well as that between linguistic proficiency and stuttering severity, we indexed each subject with a linguistic proficiency score resulting from the average of all the z-scores obtained in each test of BVL 4-12. Neither the correlation between the averaged BVL 4-12 scores and the KiddyCAT scores, nor that between the averaged BVL 4-12 scores and stuttering severity scores reached statistical significance ( $p = 0.05$ ).

## Conclusions

Regarding the sample's features and the linguistic aspects, our results turn out to be in line with the current literature (Smith & Weber, 2017; Nippold, 2018) showing a substantial similarity between the speech and language skills of stuttering and nonstuttering peers, with the possible exception of the phonetic skills required for articulating (in the naming test) and repeating (in all the three repetition tests: non-words, words and phrases). To this regard, the low scores obtained in the nonword repetition test are consistent with what has been shown by several studies (Anderson & Wagovich, 2010; Anderson, Wagovich & Hall, 2006), which points to a group weakness in the phonetic-phonological abilities of the CWS (Unicomb, Kefalianos, Reilly, Cook & Morgan, 2020). Interestingly, another task of the BVL 4-12 battery that assesses this ability is that of Articulation (in the Naming test), in which rather low performances were found, with a quarter of the subjects falling below -2 SD, and in fact the two trials positively correlate with each other ( $Rho = .65, p < 0.01$ ).

Finally, no other significant correlations were found, neither between CA and stuttering severity (as in Winters and Byrd, 2021), nor between CA and speech and language skills. In our opinion, the absence of correlations could be explained by the unusually positive CA held by most of the subjects, with a mean score well below the mean for CWS in Bernardini et al. (2019), and by the absence of any certified comorbidity with other speech and language disorders.

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## Session 3

# Therapy methods and clinical research

### REHABILITATION AND VALIDITY OF THE UTBAS-I (THE UNHELPFUL THOUGHTS AND BELIEFS ABOUT STUTTERING SCALE-THE ITALIAN VERSION) IN THE ITALIAN POPULATION: PRELIMINARY STUDY

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### ABSTRACT

Stuttering during adulthood is more frequently associated with anxiety disorders, especially social anxiety disorder. The Unhelpful Thoughts and Beliefs about Stuttering (UTBAS) (St. Clare et al., 2009) is a self-report measure able to highlight the cognitive component of social anxiety for those who require a specific assessment among adults who stutter. The purpose of this study is to preliminarily assess psychometric properties of the Italian version of the Unhelpful Thoughts and Beliefs about Stuttering Scales (UTBAS-I) that was forward- and back-translated by the first and second author. Moreover, we will assess the relationship between unhelpful thoughts and anxiety, exploring the hypothesis of a relationship between the two.

The participants were 20 adults who stutter (19–48 years), including 16 males and 4 females, and 20 non-stuttering control adults (AWNS) matched for age and gender. Preliminary results on statistical properties of the Italian version of the UTBAS-I revealed high reliability, validity and discriminant validity. Correlation analysis between UTBAS-I and anxiety in adults who stutter showed a high correlation to social anxiety and negative communication attitudes toward speech. Also, the adults who stutter as a group showed significantly higher levels of trait and social anxiety compared to those who do not stutter. Our work suggests good psychometric properties of the Italian version of the UTBAS and highlights the complex processes involved in the relationship between unhelpful thoughts, anxiety (especially social anxiety) and stuttering.

## **Background**

Stuttering is a dynamic disorder encompassing a broad range of symptoms and for this reason it can be defined as a multidimensional syndrome that involves affective, behavioral and cognitive components (Guitar, 2014). The person who stutters (PWS) frequently experiences social anxiety simultaneously with their stuttering symptoms. The negative responses to stuttering and speech-related anxiety may adversely affect the quality of life of PWS (Craig & Tran, 2014; Messenger et al., 2004). Developmental stuttering may be associated with social and emotional consequences across the entire lifespan including expectations of social harm, fear of negative evaluation, impairments in social interactions and a lower quality of life, distress, shame, self-consciousness and poor self-esteem (Cream et al. 2003, Yarus & Quesal, 2004). In this regard, during the past decade, researchers generated evidence about the existence of an association between anxiety disorders and stuttering (Iverach & Rapee, 2014). Data suggest that approximately 22–60% of adults seeking treatment for stuttering suffered from disorders such as social anxiety (Menzies et al., 2008; Craig & Tran, 2014; Smith; 2017). Also, a dramatic increase in odds of a range of psychiatric disorders among PWS compared to healthy controls has been demonstrated (Blumgart et al., 2010). In addition, the presence of mental health disorders among adults who stutter (AWS),

including anxiety disorders, has been shown to interfere with the recovering processes (Craig & Hancock, 1995; Onslow, 2017) and have the potential to negatively impact the maintenance of fluency after speech restructuring treatment (Iverach et al. 2009). In clinical psychology, anxiety is viewed as a construct that consists of three components: cognitive, behavioral, and physiological (Hofman & Barlow 2002). In the case of social anxiety, cognitions generally concern the threat of negative evaluation by others; beliefs that others will judge a person negatively for stuttering and that the opinions of others are important (Clark & Wells and 1995). Considering all that has been reported so far, it is clear we need to identify tools able to assess the presence and frequency of cognitive components of social anxiety among AWS. To address this need, St. Clare et al. (2009); Iverach et al. (2011) developed and validated the Unhelpful Thoughts and Beliefs about Stuttering (UTBAS) scale, a self-report measure that contains 66 items that assess the frequency of unhelpful/negative thoughts and beliefs associated with social anxiety in stuttering. The UTBAS demonstrated strong internal consistency, test – retest reliability, and convergent and discriminant validity. In particular, the measure was found to discriminate between the unhelpful cognitions related to social anxiety for stuttering and control participants, with large effect sizes (Iverach et al., 2011). Higher UTBAS scores are associated with an increased likelihood of meeting DSM-5 diagnostic criteria for anxiety disorders. Moreover, adaptation of the scale in different countries should contribute to establishing UTBAS as a cross-cultural tool used in clinical settings (Chu et al., 2016; Klarin et al.; 2018; Aydin Uysal & Ege; 2019).

## AIM

Italy is still lacking standardized assessment tools for AWS. To fulfil this need the aim of the present study was to: 1) assess psychometric properties of the Italian version of the Unhelpful Thoughts and Beliefs about Stuttering Scales (UTBAS-I); 2) compare unhelpful thoughts and beliefs in speech situation of AWS and AWNS assessing UTBAS discriminant validity; 3) compare the relationship between unhelpful thoughts and anxiety in AWS and AWNS.



## Methods

### *Participants*

A total of 40 participants were included in this study. The subjects were divided into two groups matched for age and gender: 20 AWS, recruited through the Clinical Center ABC BALBUZIE©, and 20 AWNS recruited by the academic staff of University of Padua (students and researchers). In each group, there were 16 males and 4 females aged between 19 and 48 years (mean age = 29.25; s.d. = 8.00).

### *Materials*

To evaluate the negative thoughts and beliefs associated with social anxiety, the Italian version of the *UTBAS* was completed. The *UTBAS* is a comprehensive self-report measure (66-items) consisting of three sections that assess: the frequency of negative thoughts and beliefs, (*UTBAS-1*); the degree to which the patient believes these thoughts, (*UTBAS-2*); the level of anxiety associated with these thoughts (*UTBAS-3*). Each item is rated on a 5-point Likert scale and the total score can vary from 66 to 330. Moreover, the *State-Trait Anxiety Inventory (STAI Y1-Y2)* (Spielberg et al., 1993) was administered to assesses state and trait anxiety and the *Fear of Negative Evaluation Scale (FNE)* (Watson & Friend, 1969) to assesses the expectation and fear of negative evaluation from others that suggest the presence of social anxiety. Cognitive and affective components of speech were assessed using two questionnaires from the *Behaviour Assessment Battery* (Vanryckeghem & Brutten, 2018): the *Communication Attitude Test for Adults* (BigCAT) and the *Speech Situation Checklist-Emotional Reaction* (SSC-ER). Specifically, the BigCAT investigates the individual's speech-associated beliefs, whereas the SSC-ER examines a client's reported emotional reaction in a range of different speech situations. For the AWS group the stuttering severity was assessed using the *Stuttering Severity Instrument (SSI-4)* (Riley, 2009).

## *Procedure*

The procedure differed between the two groups. All AWS were recruited and assessed in a clinical setting, where they received informed consent, and all questionnaires to be completed. For the AWNS group, due to the Covid-19 pandemic, data were collected in online form, using Qualtrics Experience Management (XM) software.

## **Results**

### *Preliminary analysis on UTBAS-I psychometric properties*

The UTBAS-I internal consistency was assessed by calculating Cronbach's alpha coefficient for each of the three subscales separately in the AWS group and the AWNS group. In the AWS group, Cronbach's Alpha ranged from .92 to .95 (UTBAS-I 1 = .95; UTBAS-I 2 = .92; UTBAS-I 3 = .95), while in the AWNS group it ranged from .90 to .94 (UTBAS-I 1 = .90; UTBAS-I 2 = .94; UTBAS-I = .94). These results suggest a very high level of internal consistency. Moreover, the correlation between scales was calculated separately in AWS and AWNS. In both cases all the correlation results were significant with values ranging from .89 and .98 in the AWS group and from .61 to .94 in the AWNS group. These results indicate that the three scales are part of the same construct both for AWS and for AWNS. Additionally, the discriminant validity was calculated by comparing AWS and AWNS scores in UTBAS-I 1,2,3, matched for age and gender. A significant differences on scale 1 ( $t(38)=7.19$ ,  $p < 0.001$ ), scale 2 ( $t(38)=7.47$ ,  $p < 0.001$ ), scale 3 ( $t(38)=5.78$ ,  $p < 0.001$ ) and UTBAS-Total ( $t(38)=7.07$ ,  $p < 0.001$ ) emerged. Taken together these results indicate that UTBAS-I can discriminate between AWS and AWNS: AWS groups have higher scores than AWNS groups.

Table 1 reports descriptive statistics and the results of a comparison between AWS and AWNS in state-trait, social anxiety and emotional reaction in speech situations.

VARIABLE	AWS M (DS)	AWNS M (DS)	ANOVA	
			F	p-value
STAI Y-1	41.9 (11.02)	35.9 (6.77)	4.30	.045
STAI Y-2	48.0 (9.03)	40.3 (6.66)	9.42	.004
FNE	19.2 (6.53)	13.1 (5.62)	10.18	.003
SS-ER	140.1 (28.70)	76.3 (22.85)	60.47	.001

Table 1: Descriptive statistics and results of a comparison between AWS and AWNS in measures anxiety

Significant differences emerged in all the variables considered, with AWS showing higher levels of anxiety in all the tests considered.

Finally, the correlation between Unhelpful Thoughts and Beliefs, anxiety, and communicative attitude was explored separately in AWS and AWNS (see Table 2).

	UTBAS I		UTBAS II		UTBAS III		UTBAS TOT	
	AWS	AWNS	AWS	AWNS	AWS	AWNS	AWS	AWNS
<b>STAI Y-1</b>	-.082	.53*	.098	.24	-.0463	.415	-.046	.462*
<b>STAI Y-2</b>	.421	.547*	.412	.2	.426	.294	.466*	.385
<b>FNE</b>	.667**	.479*	.534*	.453*	.691***	.500*	.730***	.575**
<b>SSC-ER</b>	.39	.44	.15	.23	.59**	.32	.49*	.38
<b>BigCAT</b>	.746***	.318	.582**	.150	.627**	-.033	.724***	.126

Table 2: Correlation between the four subscales of the UTBAS-I and state- trait, social anxiety, emotional reaction in speech situations, communication attitude in AWS and AWNS. Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

In the AWS group significant high correlations were found between Unhelpful thoughts and beliefs and social anxiety ( $r = .73$ ), and negative communication attitude ( $r = .72$ ), while moderate correlation with speech situation emotional reaction ( $r = .49$ ) and trait anxiety ( $r = .466$ ), were found. However, only a small number of no significant correlations between unhelpful thoughts and stuttering severity ( $r = .25$ ) were found. In the AWNS group, significant positive moderate correlations were found between

Unhelpful thoughts and beliefs and social anxiety ( $r=.575$ ), as well as with state anxiety ( $r=.462$ ).

## **Conclusions**

Our preliminary results demonstrate a good reliability and validity of the UTBAS-I for the original version of the questionnaire (Iverach et al., 2011; St Clare et al., 2009). Moreover, the UTBAS-I proved to be a good test for discriminating between AWS and AWNS, the first group showing significantly higher scores in each scale and in the total score. Furthermore, our results show that AWS experience higher levels of anxiety than the AWNS in all the aspects considered. This finding is coherent with previous literature which reports higher indices of trait anxiety and social anxiety in subjects with stuttering (Craig & Tran, 2014). Finally, the results confirmed the hypothesis that there is a relationship between negative cognitions and thoughts and anxiety, and in particular social anxiety in AWS. Moreover, negative thoughts and beliefs were highly correlated with communicative attitudes, while no significant relationship was found with stuttering severity. Taken together our results suggest good psychometric properties of the Italian version of the UTBAS. Moreover, our data confirm, according to previous research data, the hypothesis of a relationship between unhelpful thoughts and anxiety in AWS.

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**EXPLORING THE INTEGRATION OF VIRTUAL REALITY AND BIO-SENSORS IN STUTTERING TREATMENT: PROTOCOL PRESENTATION (FIRST STEP)**

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## **Introduction**

Stuttering is a verbal fluency disorder characterized by involuntary interruptions in speech that impact the speaker's ability to communicate, which affects his/her social life. Over the years, several studies have demonstrated an association between stuttering and social anxiety disorders in several categories of people, including adults (Blumgart, Tran, & Craig, 2010; Iverach et al., 2009, 2011; Menzies, Brian, & Block, 2008), adolescents (Mulcahy et al., 2008; Gunn et al., 2014) and children (Iverach et al., 2016). As Iverach and Rapee (2014) underline, people who stutter (PWS) frequently show fear of negative evaluation, negative thoughts, avoidance and safety behaviors. Some of the most feared situations that PWS may experience include: talking to unknown people, talking in front of an audience, talking to higher ranking people and talking on the phone (Ballanger et al., 1998). These limitations negatively impact the quality of their life and cause restrictions on social participation (Iverach et al., 2018; Mulcahy, Hennessey, Beilby, & Byrnes, 2008).

In the treatment of anxiety disorders a common approach is that of exposure-based intervention (Yang et al., 2019). In this type of therapy, after a careful analysis of the thoughts, emotions, and behaviors elicited, the patient is gradually exposed to the difficult situation. Within the therapeutic clinic, it is possible to make the patient face situations of controlled verbalization, in which the PWS must interface with one/two interlocutors, while it is more complex to replicate situations of daily life

far from the therapeutic setting and objectify the individual's emotional activation.

These limitations can be overcome through the use of virtual reality (VR) and biosensors. VR can be used to recreate situations similar to everyday life, but in a safe and controlled environment. Within the VR experience, the therapist can provide stimuli to the patient and see if an alteration of the patient's emotional state is triggered. Biosensors, on the other hand, have proven to be reliable tools for measuring vital parameters. Used during therapy, they can keep track of the patient's biological progress by collecting data such as body temperature, heart rate and galvanic skin response. Properly combined and processed, this data can provide information about the patient's state of stress, making it much easier for the therapist to see which stimuli are the most 'activating' for the PWS.

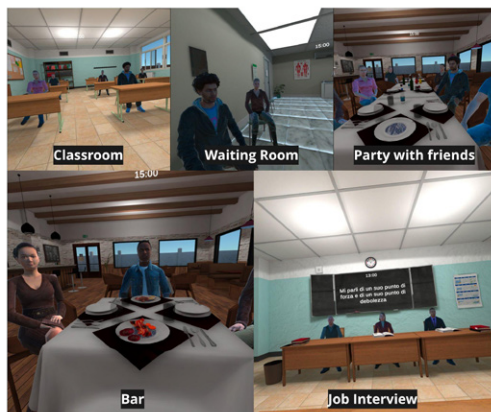
To date, only four articles have been presented on this innovative modality: three with adults and one with children/adolescents (Brundage & Hancock, 2015; Brundage, Graap, Gibbons, Ferrer, & Brooks, 2006; Brundage, Brinton, & Hancock, 2016; Moïse-Richard, et al., 2021), but none of them use virtual reality and biosensors together. Patients were exposed to various situations related to everyday life: job interview, school environment, public speaking. Some variables were also analyzed, such as the effect of the number of interlocutors or their reactions. The studies, which have been carried out, allowed us to analyze how the anxiety activation generated by VR can be comparable with that present in the daily life of subjects who stutter. This allows us to say that VR could be a good tool for anxiety elicitation and therefore therapy desensitization.

This article presents *Speak in Public*, a system integrating virtual reality and biosensors for the treatment of stuttering. The therapist can control the system through a platform that allows him/her to follow the user during the VR experience and administer stimuli. Thanks to the integration with the biosensor, the physical response of the user is collected objectively and processed in order to provide the therapist with information about the patient's stress state. The experimental protocol of a study carried out to test the power of the designed application is also presented.



## Speak in public

«Speak in Public» is an experimental tool designed to offer new and advanced forms of intervention for the treatment of stuttering. The system consists of a Virtual Reality application for Oculus Quest 2, an Android application to connect to the biosensor and a web platform that allows the therapist to start the virtual reality activity integrated with the biosensor, collect data, and review past sessions obtaining further meaningful insights on the patient's state of stress. In the next sections, the different components of the system are described.



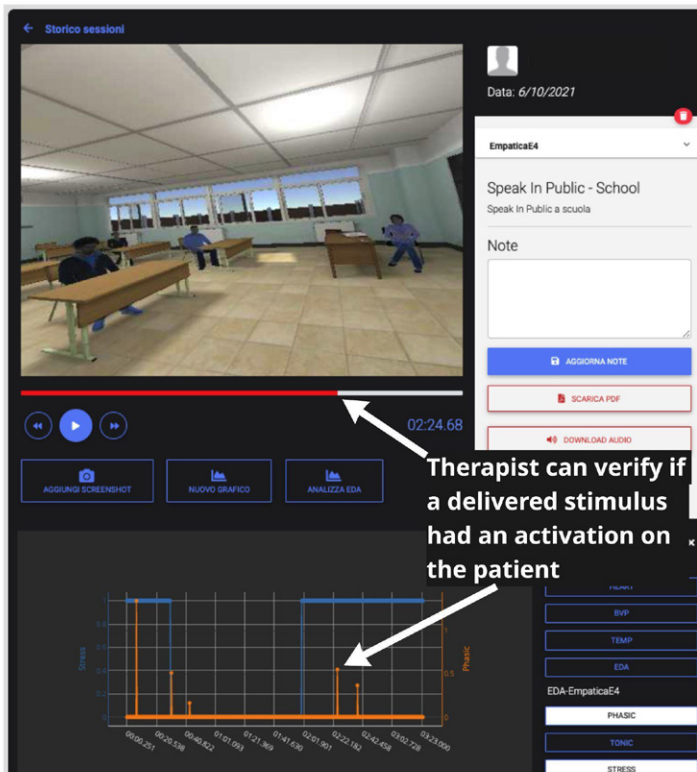
### *VR Application*

The VR application was designed together with the therapists using an iterative codesign process. The activities are realistic simulations that recreate Q&A situations in which the user is assigned a certain amount of time to talk about a given topic. These scenarios offer the user a VRE in which they can train their public speaking skills in a safe and controlled way. Currently, the Speak in Public VR application contains 5 scenarios: bar, party with friends,

doctor's waiting room, classroom and job interview. While in the experience, the user receives new topics or questions to answer within the app in two formats: text-based or speech-based. Question generation can be random or left to the therapist who can follow the whole user experience from the platform. The user's answers are only verbal and are recorded by the platform for future analysis. Each activity can be further customized by the therapist who can choose to add or remove distractors. There are two categories of distractors: visual (lights that go out, arrival of the waiter to distract the user) and audio (yawning, a door slamming, a phone ringing). The therapist knows when to activate a distractor as he/she can see what the user is experiencing in virtual reality. At the end of the session the whole VR experience (audio and video) is saved on the platform and the therapist can check it again afterward.

### *Therapist Web Platform*

The platform allows therapists to start new sessions and to review past ones. Once a session has been started, the therapist can monitor the user experience in the virtual environment while being able to activate and deactivate distractors and questions to arouse stress in the user. During the session, the therapist can also visualize data coming from the biosensor. Since these data are not easy to read, the therapist has other tools available in the post-session phase to infer the patient's state of stress.



**Therapist can verify if a delivered stimulus had an activation on the patient**

In fact, once a session is over, the therapist can download the audio of the session and view graphs showing the trend of biophysical signals gathered during the session. Further analysis can be performed on these signals to obtain more readable data related to stress. The first analysis allows us to derive the phasic component of the EDA signal. When there are variations in phasic activity, they occur in the form of peaks. The EDA peaks are reflective of the greater emotional arousal experienced during stress. However, it is important to note that while more EDA peaks indicate greater emotional intensity, the direction of this emotion (valence) can

not be derived from EDA alone. The EDA signal is therefore not representative of the type of emotion, but simply the intensity of it. In order to better understand the emotion that generated the peak, we developed a second algorithm that takes all the raw signals coming from the Empatica and produces an output graph in which the curve is 0 if the user was not stressed, 1 if she was stressed.

The platform also allows for superimposing the different graphs. In this way the therapist can visualize the number of EDA peaks together with the stress curve to investigate its nature.

## **Exploratory study**

### *Objectives*

The aim of the study is to verify the effectiveness of a training carried out in VR, through the analysis of measurements of biometric parameters and objective indices of the state of neurophysiological activation of individuals. In particular, the neurophysiological responses and anxiety generated by VR and traditional training were analyzed and compared in order to establish whether the responses from the two groups of patients can be superimposed, but also to investigate the presence of a connection between neurophysiological activation and the presentation of certain types of stimuli (distractors, annoying or judgmental questions, stimuli that put time pressure). This publication will present the protocol used in the trial.

### *Participants*

The sample is composed of 10 adolescents who stutter, 6 males and 4 females, recruited on a voluntary basis at the CRC - Center Research and Care of Rome. Selection was made according to the following inclusion criteria:

- Diagnosis of stuttering (mild to moderate)
- Age: 15-19 years

- Mother tongue: Italian
- Absence of anxiety disorders

In order to obtain two comparable samples, all subjects were preliminarily assessed through the administration of the SSI-4 test (Stuttering Severity Instrument- 4th edition) for the evaluation of the severity of stuttering and through the RCMAS-2 questionnaire (Revised Children's Manifest Anxiety Scale- 2nd edition) for the exclusion of an anxiety disorder. Of these 10 boys, 5 were included in the control group and underwent traditional training and 5 were included in the experimental group and underwent VR training.

### *Procedure*

The study took place at the CRC - Center Research and Care in Rome, in some rooms equipped with therapeutic materials, desks and chairs. Subjects arrived at the center accompanied by family members or independently.

Before the training, all recruited subjects were first exposed to a practice phase in which the subjects learnt how to use VR and were evaluated on possible effects of Motion Sickness.

Subsequently, a stuttering assessment was performed in a pre-test phase. This assessment was repeated at the end of the experimentation post-test phase.

The experimentation phase was divided into three moments:

1. T0-baseline: the patient undergoes a Speak in Public session in a real situation (in front of an audience). In this phase, data are collected regarding linguistic performance (measures indicated by the therapists), physiological measures (Empatica) and psychometric measures (anxiety questionnaire).
2. T1-training: the patient undergoes 5 training sessions with the Speak in Public application. In this phase, data are collected regarding fluency (measures indicated by therapists), physiological measures (Empatica).
3. T2-post training: The patient is subjected to a Speak in Public session in a real situation (in front of an audience). In this phase, data are collected regarding fluency (measures indicated by the therapists), physiological measures (Empatica), and psychometric measures (anxiety questionnaire).

## Conclusions

This paper introduces an innovative protocol on the use of VR and biosensors in the treatment of stuttering. As mentioned above, VR proved to be able to stimulate emotional reactions similar to those elicited in real situations. This provides benefits in the treatment of stuttering through gradual exposure and desensitization to verbalization situations feared/avoided by people who stutter. Speak in Public also allows the clinician to act on the environments and verbal requests proposed to people who stutter, introducing stimuli, questions, and distractors that allow the clinician to gradually increase difficulty.

The integration of the use of VR and biosensors also allows to objectify the patient's emotional activation, through an automatic measurement of the subject's physiological data. This represents a crucial element of the protocol. In fact, having objective data allows the clinician to analyze the starting level of the activation of the patient, monitor the progress during the therapy and analyze a possible maintenance of the results obtained. A future publication will focus on the results obtained from this first trial.

Future perspectives are related to the addition of the eye-tracker within the protocol, useful to analyze what the person who stutters focuses on the most and to provide new objective data to further improve the biophysical data analysis tool.

This would provide even more data at a clinical level, with significant implications at a treatment level as well, as it would be useful in the process of generalizing the results obtained in the clinic.

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## **EMPIRICAL SUPPORT FOR COUNSELLING PARENTS OF CHILDREN WHO STUTTER**

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### ABSTRACT

Parents play key roles in children's development and are important partners in the assessment and treatment of childhood stuttering. Parents' emotions, thoughts, attitudes, and behaviors impact and are impacted by their children's communication (and other) challenges. Counselling parents provides speech-language clinicians with a window into the daily lives of children who stutter and an opportunity to partner with parents to maximize therapeutic outcomes for their children and families. In this paper are examples of, and findings from, assessment tools used to obtain parents' perceptions of their children who stutter and of themselves. Examples of treatment approaches for children who stutter that incorporate parents are provided to illustrate the positive impact of parent counselling on child, parent, and family outcomes.

### **Introduction**

#### *Importance of Parents in Child Development*

«Families are children's first, longest lasting, and most important teachers, advocates, and nurturers. Positive parenting and strong family

engagement are central-- not supplemental-- to promoting children's healthy development and wellness» (<https://www.acf.hhs.gov/eecd/family-engagement>). Researchers have shown, for example, that socioeconomic gaps in child development associated with differences in parental investments in children are malleable when parents are provided with guidance for enhanced parent-child interactions. Subsequent gains are observed in children's social-emotional and academic arenas and reflect changes in parental beliefs about the impact of parenting on children's development (List et al., 2021).

### *Inclusion of Parent Counselling in Assessment and Treatment of Stuttering*

Similar themes are echoed in the clinical and research literature pertaining to childhood stuttering. Counselling practices help clinicians open channels of communication and understanding to create a partnership or therapeutic working alliance with parents that is maximally supportive of children who stutter and the parents themselves. Parents bridge the gap between in-clinic interactions and communication in the child's daily environments, providing comprehensive views of children's and parents' emotions, thoughts, behaviors, and related knowledge and beliefs about stuttering. «By involving parents, (we) ...can understand the dynamics within the family system and respond ...in helpful ways that are likely to enhance therapeutic success» (Berquez & Kelman, 2018, p. 1124).

## **Methods**

### *Assessment Tools and Evidence*

Acknowledgement of the importance of parents in therapy for stuttering has yielded tools for assessing parents' perceptions of themselves and/or their children. Questions may be scaled, dichotomous, or open-ended. Emphases may be broad (e.g., knowledge, confidence, emotional, cognitive, social, and behavioral perceptions and responses) or specific (e.g., parents' reactions or responses to children's talking and/or stuttering).

*Selected Tools for Assessing Parents' Perceptions*

Instruments developed around the globe focus on the parents' perceptions of children who stutter, and in some cases, the associations between the parents' and the children's perceptions. Available measures include the *Palin Parent Rating Scales* (Palin PRS; Millard & Davis, 2016, UK), the *Impact of Stuttering on Preschoolers and Parents* (ISPP; Langevin et al., 2010, Australia), the *Overall Assessment of the Speaker's Experience of Stuttering – Caregivers* (OASES-C; Guttormsen et al., 2020, 2021, Portugal), the *Reactions to Speech Disfluencies Scale* (RSDS; Humeniuk & Tarkowski, 2016, Poland), and the *Vanderbilt Responses to Your Child's Speech Rating Scale* (VRYCS; White et al., under revision, USA). To varying degrees, each of these assesses emotional, cognitive, and/or behavioral reactions of children who stutter and/or their parents. Uniquely, the Palin PRS asks parents about their knowledge and confidence in managing their child's stuttering, the ISPP includes attention to parents' perceptions of their children's interactions with peers, the OASES-C extends to include teachers, and the RSDS and VYRCS ask about specific reactions (emotional, attitudinal, and behavioral) of parents in response to children's disfluencies (RSDS), or talking (VYRCS). One, or a combination of these instruments may be utilized to better understand children who stutter in their communicative contexts, especially as perceived or responded to by parents. Results provide a wealth of information to clinicians for providing counseling and guidance, specific therapy recommendations, and longitudinal comparison data.

*Parents' Perceptions of Their Children Who Stutter*

Parents of children who stutter report similar perceptions across instruments, regardless of the children's ages. Commonly described children's emotions include frustration, anger, sadness, helplessness, shame and/or guilt (Palin PRS, ISPP). Cognitively, children are perceived to have negative thoughts and attitudes toward themselves and talking, and make negative assumptions about how others perceive them and their talking. Parents also note their children talk less or not at all, and may say «never mind» or

refuse to speak due to stuttering. Social interactions are also impacted with children withdrawing from peers, experiencing teasing, and being perceived by their parents as less well-attached to them (ISPP). Decreased talking parallels the finding of Tumanova et al. (2018) that higher scores on the *Test of Childhood Stuttering* (TOCS) *Speech Fluency* and *Disfluency-Related Consequences* rating scales by parents are related to shorter average utterance lengths by their children. Greater parental concern about stuttering also was associated with higher scores on both TOCS rating scales in the same study.

### *Parents' Perceptions of Themselves in Relation to Their Children Who Stutter*

The ISPP reveals some overlap between parents' self-perceptions and those they have of their children in the emotional domain, with reports of frustration, fear, worry, guilt, shame, and upset. Some parents noted impatience or feeling sorry for their child who stutters (RSDS). In the social domain, parents expressed concerns about the future impact of stuttering on their children's communication, confidence and relationships (ISPP, RSDS). Cognitively, parents may believe they caused stuttering, think of stuttering as a serious problem, believe their (young) child will recover from stuttering, or wish their child would stop talking (ISPP; RSDS). Some behavioral responses of parents include filling in words, talking for their child, interrupting, correction, avoiding eye contact, or telling the child to slow down, take a deep breath, or calm down (ISPP, RSDS, VRYCS). Positively, parents report supporting their children's talking by letting the child lead, waiting for the child to finish talking before speaking, and praising what the child said (VRYCS). Using the OASES-C, positive findings included parents encouraging their children not to give up on talking and making efforts to increase their children's self-confidence. Some parents said they found it difficult to evaluate the impact of stuttering on their children as they had not yet discussed the topic with their children. Boey et al. (2009) found that 26.8% (n=294) of parents believed their children were unaware of their stuttering when evidence of children's awareness (e.g., commenting, crying, becoming angry, sighing in response to stuttering) was identified by investigators

during children's stuttering. Rocha et al. (2020), using the OASES-C and student (OASES-S; 7-12 years) versions, found that family histories of stuttering were associated with parents' endorsing more severe reactions by their children to stuttering and poorer quality of life. Finally, differences between mothers' and fathers' perceptions and coping strategies also were evident for some instruments (OASES; RSDS).

## **Discussion**

### *Treatment Impact and Evidence*

Generally, parents are concerned and uncertain about their children's stuttering and their roles in causing, contributing, and/or helping. These perceptions are extended to their children's futures, and may generate anxiety, self-blame and have an impact on their confidence as parents. Evidence suggests uncertainty, lack of information, and unhelpful reactions and coping strategies continue over time and contribute to frustrations, misunderstandings, and communication breakdowns between children who stutter and their parents (Lau et al., 2012; Plexico & Burrus, 2012). Parent counseling, integrated into the treatment process beginning at assessment, allows clinicians to address specific areas of need in each family as revealed by the aforementioned tools (and others).

### *Evidence of Treatment Benefits with Parental Involvement*

Inclusion of parents is common in early intervention for stuttering to maximize gains in children's real-world environments. Parent counseling programs, modules, and/or topics are central to some treatment approaches (e.g., RESTART-DCM; Palin PCI). For others, parents are asked to offer verbal contingencies based on children's productions of fluent or stuttered speech, and parent counseling is integrated (but methods are not specified) to help parents understand and implement the contingencies in daily speaking opportunities (e.g., the LP).

Palin PCI is an example of a 12-week treatment that focuses on parent implementation of communication- and family-focused objectives in multiple, planned, brief, one-on-one interactions with their child and, at other appropriate times, in the home environment. The Palin PRS is one of the tools used across the Palin Centre's children's programming to assess progress by identifying parents' perceptions of impact on their children and themselves, and parents' knowledge and confidence about helping their children who stutter. Millard, Zebrowski, & Kelman (2018) reported administration of the Palin PRS to parents of children (ranging from 30 to 84 months) at initial assessment and 3, 6, and 12 months later. Findings included significant reductions in the impact of stuttering on children and on parents, reductions in stuttering severity, and increases in confidence and knowledge about how best to support their children who stutter. Children identified reduced impact of stuttering earlier in the treatment process than did parents. One of the first variables to change for parents was worry about their child and about stuttering. Understanding that the types and timing of therapeutic effects may differ for children and parents helps guide counseling. In a separate qualitative study of alignment between parents and children's hopes and expectations for therapy, Berquez et al. (2015) noted similarities in cognitive, affective, and behavioral domains. Differences include parents desiring additional education about stuttering and a greater cooperation in their households and children wanting opportunities to participate more fully in social activities.

Druker and her colleagues (2019) compared fluency therapy only to combined parent-implemented resilience training (i.e., modified Triple P: Positive Parenting Program) and fluency therapy for preschoolers who stutter. While both groups of children demonstrated decreased stuttering severity, only the children whose parents implemented resilience training demonstrated increased resilience and decreased behavioral and emotional problems. Parents who implemented resilience training also showed improvements in parenting skills. In a subsequent study (Druker et al., 2020), children with stuttering and self-regulation challenges whose parents implemented resilience training showed gains in resilience and adaptive behavior, greater reductions in stuttering in the short- and longer-term, and parental gains in parenting and resilience, compared to those who received fluency therapy

only. This demonstrates the potential positive impact of counseling-based parent training addressing not only stuttering but communication, parenting, and other elements of child development (e.g., self-regulation) within the family context. Continued research is needed to further explore these potential impacts.

## Conclusions

Parent-child relationships support early childhood development and are enhanced by parents knowing what to expect, how to respond, and when to be concerned (Benzies et al., 2021). Through counseling, speech-language clinicians help to strengthen parent-child relationships, enhance parental and family well-being, and promote healthy child development (Jeon & Myers, 2017). Specific to stuttering, we are equipped to (a) use available tools to assess emotional, cognitive, behavioral and social impacts of stuttering on children and parents, (b) increase parents' knowledge about children's development, communication, and stuttering, (c) empower parents to respond appropriately to their children's communication and stuttering, and (d) increase parental confidence in their abilities to help and support their children who stutter, across domains, in the short- and long-term.

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## TREATMENT FOR STUTTERING IN AN EVER-CHANGING WORLD

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### ABSTRACT

This paper considers the future of treatment for stuttering. How can we utilise available technology to improve access to treatments for people who stutter? What evidence is there that the emerging use of technology for the management of stuttering is effective? Finally, I will present a vision for the future.

### Background

The International Conference on Stuttering originates from the Eternal City, Rome. Rome is a city that inspires, boasting a rich history and culture with architectural masterpieces that remain 2000 years or so after they were built. The ancient Romans had a vision that the Roman Empire would exist for eternity. When I was searching for inspiration for this talk, I came across a cartoon that aired on television about 60 years ago. It too shared a vision for the future. The cartoon was «The Jetsons». The producers of The Jetsons dared to dream about the future, not unlike the ancient Romans who built the Roman Empire. However, the ancient Empire was not indestructible. Ancient history aside, The Jetsons did get it right.

The Jetsons was about a family living 100 years in the future. Daily life for the Jetsons consisted of flying cars, mobile phones, robot maids,

and, astoundingly, the internet. Today many of the futuristic technologies The Jetsons depicted are our reality. These include human drones, mobile phones, robot vacuums, and, of course, the internet. One of the most interesting predictions from The Jetsons cartoon was telehealth. In an episode, Jane Jetson was depicted with her son Elroy, his mouth open-wide, tongue protruding, facing a large television screen. On the television screen, a doctor is seen peering into Elroy's mouth. And there you have it. Telehealth! The Jetson's vision of telehealth from 60 years ago has become a common-practice reality.

### **Prediction for the future**

Inspired by The Jetsons, I am going to share a prediction for the future. At the Australian Stuttering Research Centre, we predict a world in which any person who stutters, or any parent of a child who stutters, will have access to treatment. The unique part of this prediction is that treatment for stuttering will be accessible online without a speech pathologist present. What evidence is there that online treatments without a speech pathologist being present are effective?

### **Online social anxiety treatments for people who stutter**

#### *iGlebe*

Many adults seeking treatment for stuttering are at risk of developing social anxiety disorder (Blumgart et al. 2010; Iverach et al. 2009; Menzies et al. 2008; Stein et al. 1996). *iGlebe* is an online social anxiety treatment for adults who stutter, developed by psychologists at the Australian Stuttering Research Centre. The treatment is based on established cognitive behaviour therapy procedures (Menzies et al. 2008). *iGlebe* is accessed using the internet, and there is no contact with a psychologist during treatment. Audio voice overs are played on each page of the program. The voices are of real clinical psychologists who guide the participant through the program. Participants

complete questionnaires at the beginning of the program, and the responses to those questions form the basis of the treatment, enabling an individualised treatment for each user.

Treatment with iGlebe has been demonstrated to remove diagnoses of social anxiety disorder and improve scores on a range of psychological measures. In a study with 14 participants, 50% had a diagnosis of social anxiety disorder at pre-treatment. After 5 months of access to iGlebe, only 14% retained that diagnosis (Helgadóttir et al. 2014). When iGlebe was compared to treatment with a psychologist (Menziez et al. 2019), removal of anxiety and mood disorders diagnoses were demonstrated in both groups at 12 months post-treatment. In a study with 267 participants from 23 countries, 49 participants completed all modules of iGlebe within the 5-month time frame. Measures of depression, anxiety, and stress reduced significantly from pre-treatment to post-treatment (Menziez et al. 2016).

### *iBroadway*

iBroadway is a social anxiety treatment for adolescents who stutter. iBroadway was adapted from iGlebe to make content and activities appropriate and appealing for adolescents. In a study with 29 adolescent participants, for those who completed the program, the number of mental health diagnoses reduced significantly from pre- to post-treatment (Gunn et al. 2019).

### *Completion rates with online treatment programs*

In a recent systematic review, iGlebe was shown to have the highest completion rate among other online programs for psychological conditions such as anxiety and depression (Fleming, et al., 2018). In addition, iBroadway reported a compliance rate of just over 50% (Gunn et al. 2019). Why do iGlebe and iBroadway show such high compliance rates compared to other online psychological treatments? iGlebe was developed to be interactive and to encourage engagement with the program (Helgadóttir et al. 2009). Every

user has a unique pathway through the program. Supportive voiceovers of experienced psychologists who guide the participant through the program were unique at the time of development. Finally, at the end of treatment, users can download an eBook containing content from the program.

## **Online speech treatments for people who stutter**

### *iLidcombe*

iLidcombe is an online treatment for children who stutter. It is based on the Lidcombe Program, a treatment that involves parents providing verbal contingencies to their children, based on the presence and absence of stuttering (for detailed reviews, see Onslow 2021; Sjøstrand et al. 2021).

During treatment with iLidcombe, parents are taught the treatment procedures with supportive voiceovers, video demonstrations, and suggestions for activities to do with their children during the treatment. Printable materials about treatment procedures are downloadable. Children do not engage with the program at all. Parents conduct the treatment with their child after they have learnt the procedures, as with the standard Lidcombe Program.

In a study of iLidcombe, eight parents of children who stuttered completed the initial training components of the program (Van Eerdenbrugh et al. 2018). Results demonstrated that parents can be trained to measure their child's stuttering with an online program, without a speech pathologist. Importantly, parent severity scores corresponded with speech pathologist scores. Parents also reported they had acquired the skills to conduct the treatment with their child.

### *iWestmead*

iWestmead is an online treatment for very young children who stutter. iWestmead is based on the Westmead Program during which parents are taught the treatment procedures, including how to talk to their child using

what is called syllable talking (Andrews et al. 2020; for a detailed review, see Onslow, 2021).

iWestmead trains parents to conduct the treatment with their child. As with iLidcombe, children are not required to engage with the program. The program includes voiceovers to guide parents through the treatment, audio demonstrations of the syllable talking, and suggested activities for parents to use with their child. iWestmead is currently undergoing user testing before clinical trials. This involves parents and speech pathologists reviewing the program and providing feedback for clarity of information, ease of navigation, and overall acceptability of the content (Currie et al. 2010).

### *iCamperdown*

For adults wanting to control stuttering, speech restructuring is the most efficacious approach (for a detailed review, see Onslow, 2021). It involves teaching clients to speak in a way that helps them to control their stuttering. The Camperdown Program is one method that teaches speech restructuring (O'Brian et al. 2018). iCamperdown is based on the Camperdown Program. During the treatment, users learn the speech restructuring technique from video examples. The program provides reading material, talking topics, and suggested activities to help the user practice the speech technique and to integrate it into their daily lives. Supportive voiceovers guide the user through the treatment. In a study of iCamperdown with 20 participants, for those who completed the treatment, significant reductions were demonstrated from pre-treatment to post-treatment for stuttering severity measured by percentage of syllables stuttered (Erickson et al. 2016).

## **The future of online treatments**

What is the future of online treatments for stuttering? Artificial intelligence, known as AI, refers to machines or computers that have been developed to think and act like humans. AI has the potential to assess clients and direct them to treatments most suitable for them. Our prediction is

that clients will be managed from assessment through to discharge without a speech pathologist or psychologist.

### **The future for speech pathologists**

What does this mean for the future of speech pathology? Online treatments won't be suitable for everyone. For example, online treatments may not be suitable for clients with complex communication needs, such as those with concomitant disorders. Online treatments can manage simple cases, then speech pathologists can treat clients with more complex needs or those for whom online treatments are not suitable.

### **Conclusions**

The ancient Romans had a vision that the Roman empire would exist for eternity. And yes, Rome exists today in all its glory, but not in the way the ancient Romans had predicted. However, the producers of *The Jetsons* predicted the future and they did get it right. Treatment for anyone who stutters, anywhere in the world, without a speech pathologist or psychologist, is our prediction. And, like *The Jetsons*, we are aiming for that to become a reality.

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**RELIABILITY OF THE STUTTERING SEVERITY INSTRUMENT-FOURTH EDITION - ITALIAN VERSION IN CHILDREN, ADOLESCENTS, AND ADULTS WHO STUTTER**

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**ABSTRACT**

Assessment is the first step in the clinical management of stuttering. Among the different tools to assess stuttering severity, the Stuttering Severity Instrument is one of the most widely applied. The Stuttering Severity Instrument-Fourth Edition (SSI-4) (Riley, 2009) reliability data are available in different languages. No data exists for Italian PWS.

The aim of the present study is to analyze intra- and inter-rater reliability of the SSI-4 for Italian PWS. A secondary aim is to compare SSI-4 scores between PWS and PWNS.

Two raters (SLT students) were trained on the use of SSI-4. They scored videotapes derived from a clinical sample composed of 9 preschoolers, 9 schoolers, 9 adolescents and 9 adults who stutter at Time 1 and Time 2 (two weeks later). The same procedure was followed for a normative sample, composed by 9 preschoolers, 9 schoolers, 9 adolescents and 9 adults who do not stutter at Time 1 and at Time 2. SSI-4 parameters (frequency, duration, physical concomitants, total scores) were analyzed to investigate intra- and inter-rater reliability. In addition, collected data were used to compare scores between PWS and PWNS.

For the preschooler sample (n=9), inter-rater reliability resulted «high» for frequency score (ICC=0.85), «fair» for duration (ICC=0.67), and physical concomitants scores (ICC=0.73), «excellent» for total score (ICC=0.95); for the school-age and adolescent samples (n=18), inter-rater reliability resulted «high» for frequency score (ICC=0.81), «fair» for duration score (ICC=0.61), «high» for physical concomitants score (ICC=0.83), and total score (ICC=0.89); for the adult sample (n=9), inter-rater reliability resulted «excellent» for frequency (ICC=0.93), duration (ICC=0.93), and total scores (ICC= 0.94), and «high» for physical concomitants score (ICC=0.79). In-

tra-rater reliability resulted «excellent» ( $ICC > 0.90$ ) for each score of SSI-4 in all the examined samples. A significant difference between preschoolers, school-age, and adolescents who stutter and who do not stutter respectively was noted in frequency (preschoolers:  $p = 0.036$ ; school-age and adolescents:  $p = 0.014$ ), physical concomitants (preschoolers:  $p = 0.035$ ; school-age and adolescents:  $p = 0.014$ ), and total scores (preschoolers:  $p = 0.031$ ; school-age and adolescents:  $p < 0.001$ ). Preschoolers, school-age and adolescents who stutter had no duration scores significantly higher than preschoolers, school-age and adolescents who did not stutter. No significant difference between AWS and AWNS' scores was found.

The results of the current study are mainly based on Tahmasebi et al. (2018) study on the reliability and validity of the SSI-4 – Persian version. Specifically, they reported an «excellent» intra- and inter-raters reliability ( $ICC > 0.91$ ) for each of the parameters, except for the physical concomitant behaviour sub-test in which the self-agreement was slightly lower ( $ICC = 0.86$ ). However, Tahmasebi's higher ICC values for both inter and intra-rater reliability might be due to a different experience within raters involved. In fact, their judges included 10 experienced SLTs. According to this, Riley's intra-judge percentages of agreement is 87.1% and 85.9% respectively for frequency and duration scores within the trained examiners group (composed by students), and 93.9% and 96.4% for frequency and duration scores within the research team (composed by SLTs).

SSI-4 Italian version can be used as a reliable tool to assess stuttering severity. Further studies are needed to investigate its validity.

## **Introduction**

One of the most common definitions of stuttering derives from the World Health Organisation (1977), which defines stuttering as a «disorder in the rhythm of speech, in which the individual knows precisely what he wishes to say, but at the same time is unable to say it because of an involuntary, repetitive prolongation or cessation of a sound». However, this definition does not consider accessory behaviors of stuttering, such as escape or avoidance behaviors, and cognitive and emotional reactions to stuttering itself.

In fact, the Stuttering Foundation (1995) successively defined stuttering as a «communication disorder characterized by excessive involuntary disruptions or blockings in the flow of speech, particularly when such disruptions consist of repetitions accompanied by avoidance and/or struggle behaviour.» Thus, stuttering is characterised by both core behaviors, such as repetitions, blocks, and prolongations, and accessory ones. As a consequence, according to Sheehan's metaphor (1970), stuttering assessment must consider both surface and underlying symptoms associated with stuttering.

Clinical measurements of stuttering are important for different reasons: a) to communicate with clients, b) to state treatment goals, c) to assess progress, d) to manage maintenance of treatment results, e) to keep track of daily stuttering severity changes (Onslow, 2020). In addition, the diagnostic process demands that data collected during assessment should be both reliable and valid in order to be effectively applied to the treatment process.

Starting from the tip of the iceberg, among the different tools to assess stuttering severity, the Stuttering Severity Instrument is one of the most widely applied. The Stuttering Severity Instrument – fourth edition (SSI-4) (Riley, 2009) provides scores and severity ratings based on three parameters: a) frequency, b) duration of core behaviors, c) the presence, and the nature of physical concomitants. It can be used to assess preschoolers, collecting and analyzing just speech samples in order to define the percentage of stuttered syllables (%SS); whereas SSI-4 is used with school-age, adolescents, and adults, the frequency score is derived from both a speaking and a reading task.

Although SSI-4 has many applications, both in research and clinical fields, its statistical properties were only partially investigated (Davidow & Scott, 2017). Moreover, SSI-4 reliability data are available in different languages (Tahmasebi et al., 2018), but no data exists for Italian PWS.

## **Objectives**

The aims of the present study are: 1) to adapt SSI-4 scoring procedures into Italian, 2) to analyze SSI-4 Italian version intra- and inter-raters' reliability, and 3) to compare SSI-4 scores between PWS and PWNS.

## Methods

The participants were 2 graduate students in speech and language pathology at University of Milan who acted as raters (Rater 1 and Rater 2). Both of them were trained on the use of the SSI-4 by analyzing and scoring SSI-4 on 10 videotapes (5 speaking tasks and 5 reading tasks) derived from PWS collected previously. They were supervised by an SLT who has 5 years' experience in fluency disorder assessment and treatment. After this training, they were asked to score SSI-4 on a clinical sample composed of 9 preschoolers, 9 school age, 9 adolescents and 9 adults who stutter at Time 1 and Time 2 (two weeks later). The same procedure was followed for a normative sample, matched for age and gender to the clinical one, consequently composed by 9 preschoolers, 9 school age, 9 adolescents and 9 adults who do not stutter. Specifically, each video was independently analyzed by Rater 1 and Rater 2 at baseline and after two weeks to derive intra- and inter-rater reliability. In addition, data analyzed by Rater 1 were used to compare the clinical group to the control one, as a preliminary investigation of SSI-4 clinical validity. In particular, the comparison between the two groups was made for each of the SSI-4 scores (frequency, duration, physical concomitants, and total score) within both age and gender matched samples and total samples.

### *Statistical Analysis*

Statistical analysis was done using MedCalc Software. The Shapiro-Wilk Test was used to study each measure's trend distribution. The normality assumption was verified for the following variables of the clinical group: frequency score within the total sample, frequency, and total score within the preschooler, school age, and adolescent samples. The remaining variables were not normally distributed. Intra- and inter-rater reliability were defined for the clinical sample by Intraclass Correlation Coefficient (ICC), using a single-measurement, absolute-agreement, two-way random model. The ICC outcomes were interpreted according to previous guidelines (Koo & Li, 2016): ICC was classified as *excellent* ( $r > 0.90$ ), *high* ( $0.75 < r < 0.90$ ), *fair* ( $0.50 < r < 0.75$ ), or *weak* ( $r > 0.50$ ). To investigate SSI-4 scores comparison between PWS and

PWNS, each measure (frequency, duration, physical concomitants, and total score) was compared using paired Student's t-test or Wilcoxon Test, depending on the trend distribution. In particular, the comparison was made between both age and gender matched groups (g.e. preschoolers who stutter vs preschoolers who do not stutter), and total samples too (PWS vs PWNS).

## Results

### *Inter-rater reliability*

Considering the preschooler sample (n=9), inter-rater reliability resulted «high» for frequency score (ICC=0.85), «fair» for duration (ICC=0.67), and physical concomitants scores (ICC=0.73), «excellent» for total score (ICC=0.95); inter-rater reliability resulted «high» for frequency (ICC=0.81), physical concomitants (ICC=0.83), and total scores (ICC=0.89), «fair» for duration score (ICC=0.61), within the school age and adolescent sample (n=18); regarding the adult sample (n=9), inter-rater reliability resulted «excellent» for frequency (ICC=0.93), duration (ICC=0.93), and total scores (ICC=0.94), and «high» for physical concomitants score (ICC=0.79). Considering the total sample (n=36), which included all different age groups, inter-rater reliability resulted «high» for frequency (ICC=0.88), and physical concomitants scores (ICC=0.79), «fair» for duration score (ICC=0.71), and «excellent» for total score (ICC=0.94).

### *Intra-rater reliability*

Intra-rater reliability resulted «excellent» for each of the SSI-4 scores (ICC>0.90), considering both different age groups, and total sample.

### *SSI-4 comparison between PWS and PWNS*

Comparisons between preschoolers who stutter and preschoolers who do not stutter showed a significant difference between the two groups for

frequency ( $p=0.036$ ), physical concomitants ( $p=0.035$ ), and total scores ( $p=0.031$ ); a significant difference was not observed for duration score between the two groups ( $p=0.418$ ). As a consequence, a significantly higher percentage of stuttered syllables (% SS), and physical concomitants and stuttering severity were observed in the clinical group compared to the control one. Comparisons between schoolers and adolescents who stutter, and schoolers and adolescents who do not stutter showed the same results. Significant differences were found for frequency ( $p=0.014$ ), physical concomitants ( $p=0.014$ ), and total scores ( $p<0.001$ ); no significant differences between the two groups were found for duration score ( $p=0.073$ ). Comparisons between adults who stutter, and adults who do not stutter showed no significant differences for each SSI-4 score ( $p>0.098$ ). Significant differences were found for frequency, physical concomitants, and total scores ( $p<0.001$ ) between clinical and normative samples; no significant differences between the two groups were found for duration score ( $p=0.015$ ).

## Discussion

The aim of the present study was to investigate the psychometric properties (inter- and intra-rater reliability) of the SSI-4 Italian version in a clinical sample composed by preschoolers, school age, adolescents, and adults who stutter. In this study intra-rater reliability was «excellent» (Koo & Li, 2016) for each SSI-4 score within both total sample and different age groups, with ICC values  $>.90$ . Inter-rater reliability was generally lower than intra-rater reliability. Specifically, it was «fair» for duration score, «high» for frequency, and physical concomitant scores, «excellent» for total score within the total clinical sample. These results are similar to the Tahmasebi et al. (2018) study on the reliability and validity of the SSI-4 – Persian version. In fact, they reported an «excellent» intra and inter-rater reliability ( $ICC>0.91$ ) for each of the SSI-4 parameters, except for the physical concomitant score in which the self-agreement was slightly lower ( $ICC=0.86$ ). However, Tahmasebi's higher ICC values for both inter and intra-rater reliability might be due to a different number of raters involved, and their experience. In fact, their judges included 10

experienced SLTs, whereas the judges included in the present study were 2 SLT graduate students. As a consequence, a limited number of the raters involved in this study, added to a lower experience in SSI-4 scoring might justify this difference. According to this, Riley's (2009) intra- and inter-judge percentages of agreement were higher in the research team (composed by SLTs) compared to intra- and inter-judge percentages of agreement related to the trained examiners group (composed by SLT students). Specifically, percentages of self-agreement (intra-judge reliability) was 87.1% and 85.9% respectively for frequency and duration scores within the trained examiners group, 93.9% and 96.4% for frequency and duration scores within the research team; percentages of agreement between judges (inter-judge reliability) were 91.0% and 84.8% respectively for frequency and duration scores within the trained examiners group, 91.4% and 87.8% for frequency and duration scores within the research team. However, SSI-4 manual provides no intra-judge reliability data for physical concomitants, and total scores both within the trained examiners group and the research team, and no inter-judge reliability data for physical concomitants, and total scores within the research team. Thus, no comparison between the manual's data and ours could be made.

Davidow & Scott (2017) investigated independently intra-judge and inter-judge reliability of the SSI-4. In particular, both intra-judge and inter-judge reliability values were similar to those reported in the SSI-4 manual (Riley, 1994, 2009) and by Lewis (1995), when they used the SSI-4 procedures to calculate reliability. However, lower agreement was found when values were calculated on the basis of percentage of exact agreement, within 1 scale value, and within 2 scale values, for all subscores and the total score.

The present study was also a preliminary investigation of SSI-4 clinical validity. Specifically, comparisons between preschoolers, school age, and adolescents who stutter, and preschoolers, school age, and adolescents who do not stutter showed a significant difference for each SSI-4 score, except for duration score. The same result was obtained considering clinical and control samples entirely. No significant differences were observed comparing adults who stutter with adults who do not stutter. This result might be due to the small sample size. However, the SSI-4 manual provides no data regarding clinical validity, thus, it was not possible to make comparisons.



## Limitations

The present study has several limitations. First, small samples (both clinical and control groups) were collected. Nevertheless, the SSI-4 Italian version was able to differentiate PWS from PWNS. Further investigations are needed to verify its clinical validity. Second, a blinding procedure was used for reliability, but not for preliminary validity investigations. As a consequence, raters could be influenced at SSI-4 scoring by the PWS or PWNS' analyzed videotape. Third, the SSI-4 Italian version of intra and inter-rater reliability was only studied within a trained examiners group; it should also be investigated within experienced raters (SLTs). Finally, the SSI-4 Italian version's criterion and construct validity should also be further investigated.

## Conclusions

Assessment of fluency disorders must consider both surface and underlying symptoms associated with stuttering. The SSI-4 Italian version can be used as a reliable tool to assess stuttering severity as the tip of the iceberg. Further studies are needed to investigate its additional psychometric properties, such as clinical, criterion and construct validity.

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## **AN ADOLESCENT CONFRONTED WITH CLUTTERING: THE STORY OF JOHAN**

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### ABSTRACT

This case study describes the challenges a 10-year-old boy who started to clutter during pre-adolescence had to cope with. It illustrates the fact that cluttering in some children can only be observed when they reach the early stages of adolescence. Speech, language, cognitive and emotional results of our patient are reported in detail and related to the development of the adolescent brain.

### Introduction

Cluttering is a disorder of fluency in which a person is not able to adjust his or her articulatory rate to the linguistic or motor demands of the moment<sup>1</sup>, resulting in errors in pausing together with either a high frequency of normal disfluencies or unintelligible words<sup>2</sup>. During school years and especially in pre-adolescence and adolescence, a natural fast increase of the articulatory rate can be observed. The mean articulatory rate of fluent 3-6 years old children is 3.3 syllables per second (SPS). Children between 6.3 – 11.7 years old have a mean articulatory rate of 4.4 SPS, and between 11.8 and 22 years the mean is 5.6 SPS<sup>3</sup>, which is considered normal. Usually, the mean articulatory rate declines to 4.8 SPS after 22 years of age<sup>3</sup>. Based on the natural rate increase, many people first discover that they have cluttered speech in adolescence and young adulthood<sup>1</sup>.

### *Prevalence*

Prevalence of cluttering has not been researched to the point of being conclusive. Recent prevalence studies conducted using the working defi-

nition of cluttering<sup>4</sup> and the causal definition of cluttering<sup>1</sup>, indicate that cluttering is slightly more prevalent than stuttering<sup>5,6,7</sup> in adolescents and young adults. According to some experts, pure cluttering is present in 5-16% of the disfluent population<sup>8,9</sup> Prevalence numbers vary within age groups and should be studied in both fluent and disfluent populations.

In pre-adolescence and adolescence, being part of the social group of peers is of great importance and feeling different because of our own characteristics (e.g. stuttering, cluttering) can determine our social relations to it. For instance, if peers start to realize that a peer that clutters is sometimes difficult to understand due to his/her speech, they could start to tease him/her for the way he/she speaks and/or ignore him/her or not give credit to what is said. The same, or similar, situation could happen in a school setting with teachers assuming his/her maze behavior was «due to lack of study», «lack of motivation» or family context, with family members assuming «he/she is not studying enough» or «he/she is not a good communicator» due to his/her difficult-to-follow or to understand speech. As it happens for stuttering<sup>10</sup> we are aware that stereotypes, prejudices, discrimination, public stigmas from the environments the person who clutters lives in, could slowly become self-stigmas<sup>11</sup>, being internalized by the person itself. For example, making him/her believe he/she is not a good communicator, changing his/her way to see oneself, his/her role in society and virtually affecting the choices he/she will make in life (e.g. education, social life, work life). For these reasons, in order to avoid these contingency and social-cognitive-emotional consequences, early treatment is recommended as soon as a negative communication attitude arises.

### *What happens in the adolescent brain?*

Adolescence is defined as a transitional period between childhood and adulthood characterized by changes in social interaction and acquisition of mature cognitive abilities<sup>12</sup>. Caballero et al continue by stating that these changes have been associated with the maturation of brain regions involved in the control of motivation, emotion, and cognition. An accurate conceptualization of cognitive and neurobiological changes during adolescence

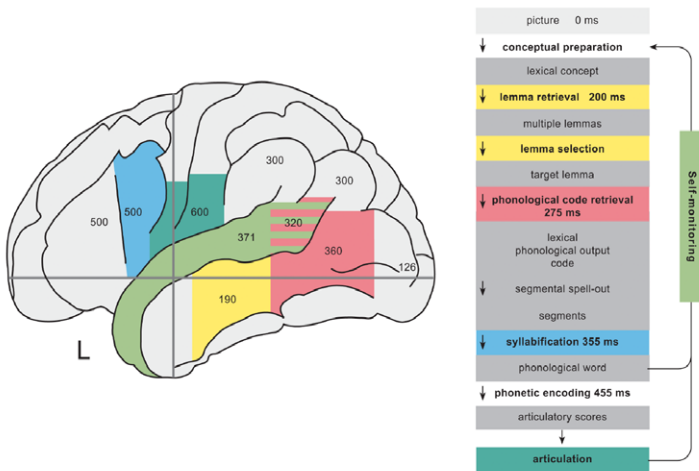
must treat adolescence as a transitional developmental period<sup>13</sup>, rather than a single snapshot in time<sup>14</sup>. In other words, to understand this developmental period, transitions into and out of adolescence are necessary for distinguishing distinct attributes of this stage of development<sup>15</sup>.

The traditional explanation of adolescent behavior has been suggested to be due to the protracted development of the prefrontal cortex, taken into consideration the development of the prefrontal cortex (that plays a key role in executive functions) together with subcortical limbic regions (e.g. nucleus accumbens) that have been implicated in impulsive choices and actions<sup>15</sup>. The nucleus accumbens is part of the basal ganglia. The basal ganglia network may be viewed as multiple parallel loops and re-entering circuits whereby motor, associative, and limbic territories are engaged mainly in the control of movement, behavior, and emotions<sup>16</sup>. The basal ganglia network seems to be involved in the (1) goal-directed system selection and facilitation of pre-frontal-striatopallidal activity during the performance and acquisition of new activities and tasks (goal-directed system); (2) reinforcement learning to create habitual responses automatically performed by the motor circuit (habit system); and (3) stopping an ongoing activity and switching to a new one if necessary, which is mainly mediated by the inferior frontal cortex/STN-cortical circuit<sup>16</sup>. Their temporary dysfunction in adolescence results in a wide range of neurological conditions including disorders of behavior control (inhibition) and movement, as well as cognitive deficits that are similar to those that result from damage to the prefrontal cortex<sup>17</sup>.

### *Adolescent Brain & Levelt Mode*

Van Zaalen<sup>1</sup> utilized Levelt's model of language production<sup>18</sup> to explain the underlying processes and symptoms of cluttering. According to Levelt, the expression of ideas is a three-step process. The first step after the communicative intention deals with planning the idea or message and monitoring whether this is an accurate moment to express this message. The second step is formulation of the message in correct grammatical sentence structures. The sentences are built with words that are gathered from the lexicon. Every word within the sentence has to be built up itself as well.

Words are built with syllables. Syllables have to be pronounced in the right order (so «bi-bli-o-gra-phy») and not «bli-bi-gra-phy-o») and in the right way (not «bli-bli-o-gra-phy<sup>7</sup>). When the sentences and words are planned and a motor plan is ready, people can proceed to the third step by expressing their thoughts. A person with cluttering often speaks at a too high articulatory rate, meaning not adjusted enough to linguistic or motor demands<sup>1</sup>. In cluttering the time in which all three steps of language production have to be finished is under pressure, compared to the normal timeframe<sup>19,20</sup> as indicated in figure 1, resulting in a high frequency of normal disfluencies, errors in pausing and/or unintelligible words<sup>2</sup>. In cluttering the speed in which all three steps of language production have to be finished is limited. It is a well-known fact that when PWC focus on speech production and as a result of that add longer pauses between phrases, they can be fluent and intelligible. Most PWC are fluent and intelligible when reading aloud, because the writer does language formulation.



**FIGURE 1** | Left column: schematic representation of the activation time course of brain areas involved in word production. Identical colors indicate relationships between regions and functional processing components (right column). The numbers

within regions indicate median peak activation time estimates (in milliseconds) after picture onset in picture naming (see Table 3 and main text). Right column: time course of picture naming as estimated from chronometric data.

*The case of Johan*

When Johan first entered the online-clinic the first impression was that of a vulnerable shy young boy. He was not really interested in talking, only politely answering my questions with a single or two-word response. His mum asked to do an assessment because she thought he could be considered a person with cluttering. A diagnosis that for sure did not fit the boy we saw during my first session with Johan. However, it was a diagnosis that fit the boy in the home-made videos, talking with his father. Johan did not adjust his speech to the language complexity of the moment, resulting in high frequency of normal disfluencies, moments of unintelligibility and fast rate of speech when he felt comfortable. His dis-synchronicity between language and rate of speech was a clear indication of cluttering.

Furthermore, careful assessment of the impact of the speech disturbances in the upcoming sessions led to the conclusion that on T1 Johan was not at all aware of any disturbance in his speech, but as he told me several times: «people do not understand or care about my messages». Moreover, he was «rather bored» by other people's stories.

Assessment of Johan was done at age 10;0 (before treatment of story-telling skills), 10;8 (start AVF-training) and 11;2 (during AVF training). The first author examined Johan's speech and language three times. The first test session took place when J. was 10 years 0 months olds. The second test session occurred when he was 10 years 8 months, one week after J. got stuck in communication and avoided speaking. And the third and last test session took place three months later (age: 11 years 2 month). Between T1 and T2 online training sessions focused on story telling skills, online follow-ups were conducted. Between T2 and T3 AudioVisual Feedback training<sup>3,21</sup> was conducted, with 45 minutes online training sessions twice a week, and everyday monitoring tasks.

All speech and language examinations were video recorded. Speech samples were collected during spontaneous speech, reading, describing, telling and retelling the Wallet story. For each test session, at least 350 words of J.'s spontaneous speech were transcribed for offline fluency analysis, using Praat speech analysis software<sup>22</sup>.

## Results

*Here we describe an overview of results. For more detail please look into our 2022 article in ASHA SIG4 Perspectives.*

When Johan was 10 years and 8 months old, his speech changed dramatically. His articulatory rate in spontaneous speech, retelling and reading increased drastically, resulting in a frequency of >25% normal disfluencies, 1% short prolongations and more than 3 moments per minute of coalescence. Although Johan was considered a fluent speaker before the age of ten, when he entered pre-adolescence, he became very disfluent and showed signs of avoidance.

### *Frequency of disfluencies*

On T1 J. produced normal disfluencies on 23% of the words in spontaneous speech, 18% of retelling a story and on 12% during reading of a text. On T2 J. produced normal disfluencies on 6% of the words in spontaneous speech, and on 14% during reading of a text. On T3 J. produced normal disfluencies on 6% of the words in spontaneous speech, 20% of retelling a story, 7% in describing and on 5% during reading of a text. (see for the overview Table 1). Word repetitions were more prominent in reading (T1: 29,2%, T2:35,7% and T3: 60%) and retelling conditions (T1: 61,1%, T2: 57,7% and T3: 70%) compared to other normal disfluencies.



<b>Time</b>	<b>Percentage Fluent words</b>	<b>Percentage Normal Disfluencies</b>	<b>Percentage Stutter like disfluencies</b>	<b>A-typical disfluencies</b>
<b>T1</b>	79.5 (SD=3.7)	17.7(SD= 5.5)	0 (SD=0)	2 (SD=1.4)
<b>T2</b>	70.3 (SD=1.9)	11.3 (SD=4.6)	4 (SD= 1.0)	2.3 (SD= .58)
<b>T3</b>	77.8 (SD=6.8)	9.5(SD= 7.1)	2 (SD= .58)	2 (SD=2.2)

Table 1: Distribution of disfluencies with data gathered in three different speech contexts on T1, T2 and T3

### *Stutter like disfluencies*

#### Total amount SDF

During the second test sessions, Johan showed a lower relative frequency of tensed part word repetitions (2.94%) while also blocks (5,25%) were observed in spontaneous speech. During the last test session, the frequency of blocks in spontaneous speech was 0% and tensed part word repetitions were on the level of T1. Prolongations were rare and if they occurred the duration was < 0.2 seconds.

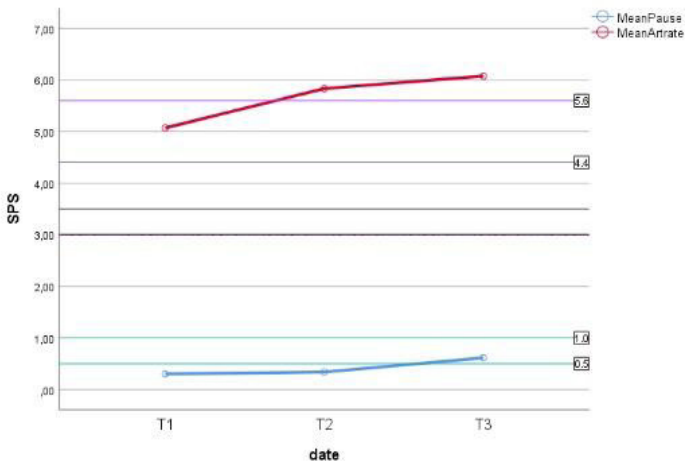
### *A-typical Disfluencies and Cluttering symptoms*

J. showed two types of a-typical disfluencies: mid-word and end-word repetitions in his spontaneous speech. In reading a text mid-word repetitions were observed in, for him, difficult to pronounce multisyllabic new words, such as «Massachusetts». The number of a-typical disfluencies did not change over time. Furthermore, in retelling a story some moments of coalescence/telescoping and false starts were observed.

*Secondary behaviors*

On T1 and T3 no secondary behavior was observed. On T 2 J. used pitch rise as mazing behavior, and in two occasions when he was stuck on very difficult to-read words (e.g. Massachusetts). The last can be considered as a phonological encoding problem.

*Mean Articulatory Rate and Pause duration*

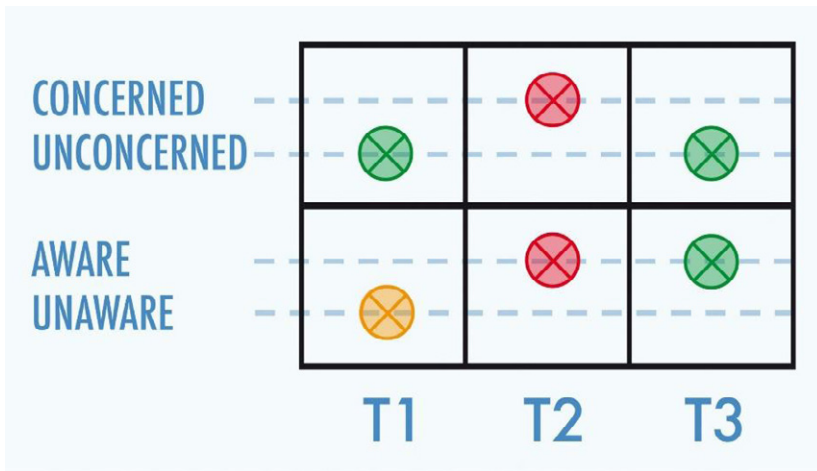


The mean articulatory rate increased from 5,07 SPS (syllables per second) on T1, to 5,83 SPS on T2 and further increased to 6,08 SPS on T3. At all times Johan’s articulatory rate was faster compared to his peers.

At the same time the pause duration remained too short on T1 and T2, while on T3 it was at an adequate level.

*Johan's attitude changes towards his speech*

Where Johan was not aware of any speech disruptions before, in November 2020 (10:8 years) he was. He said «My speech gets stuck.» «I do not want to talk anymore.» After these remarks, he started to cry intensely, but silently. Multiple moments of tensed part sound/word repetitions and blocks appeared with secondary behaviours like eye blinking, pitch rise and involuntary jaw movements appeared. Johan indicated he was not enjoying talking anymore. Where he used to talk unlimitedly before, he now conversed in short, incomplete sentences only. When Johan became negatively aware of his disfluencies, his therapy addressed speech output directly. Audio Visual Feedback Training was used on different levels of language complexity, as developed by van Zaalen<sup>21</sup>.



T1 Unaware unconcern  
T2 Aware very concern  
T3 Aware not concern

At T1 J. did not seem to be afraid of speaking and said he did not avoid speaking. He scored comparable to non-stuttering subjects on the SSC-ER<sup>23</sup>.

At T2 J. was aware of his disfluencies and tried to avoid speaking, started to cry whenever he got stuck in formulation and when tensed part

word repetitions followed each other he looked up and away and raised his voice, to stop after that.

At T3 J. was aware of his disfluencies and was able to differentiate between them and control his speech whenever he was bothered by too many disfluencies, all on the first four levels of language complexity.

## **Discussion**

The cognitive component of cluttering is somewhat diffuse and therefore difficult to recognize. The self-image of most people with normal speech is generally moderately positive. Based on a low symptom awareness, PWC generally judge their speech positively and are under the impression that listeners who have problems understanding them might not be paying enough attention to their speech. Johan's original positive self-image changed for the worst as soon as he made the connection between listeners' negative feedback and his speech. Self-image mostly develops from the time of adolescence. Self-image is mostly disturbed in pre-adolescence, around twelve to thirteen years old, in many areas: heightened self-consciousness, instability of self-image, slightly lower self-esteem, lower opinions of themselves with regard to the qualities they valued, reduced conviction that their parents, teachers and peers of the same sex held favorable opinions of them<sup>24</sup>. Within families or schools, often-unsaid remarks exist. An expression such as, «What did you say?» or «Johan talks like a greyhound» are examples of this. Although these remarks seem harmless, they negatively affected Johan's self-image and we assume they could have negative consequences in the end at a cognitive and social level. Speech language therapy gave Johan the feeling of control and the pleasure of communication back at a vulnerable age.

## **Conclusions**

In pre-adolescence, cluttering can drastically change a young child's life. While being unaware of their speech condition before adolescence, during pre-adolescence the changes in their brain organization lead to an increase

of their rate and a decrease in their speech control. Not understanding what is happening, fear of communication and communication avoidance is at risk. Audio-Visual feedback training helped Johan when he became negatively aware of his disfluencies. Speech language therapists are strongly advised to monitor children with cluttering signals in the early years of their adolescence and help them to understand what it is, how it works, how it changes and how to cope with it.

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## *Session 4*

# **Workshops**

### **LEXIPONTIX: A DIFFERENT WAY OF LISTENING TO THE SCHOOL-AGE CHILD WHO STUTTERS**

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## **ABSTRACT**

Lexipontix is a structured therapy program for school-age Children Who Stutter. It is based on theoretical principles and clinical practices of Cognitive Behavioral Therapy, Parent-Child Interaction Therapy, Solution Focused Brief Therapy, Fluency Shaping and Stuttering Modification. The Lexipontix Program explores clients' «Best Hopes» from therapy and addresses the stuttering experience of the child and family in a holistic way. The child and family are facilitated to produce changes in all components of the International Classification of Functioning, Disability and Health classification (i.e., Body Function, Personal Factors, Activity and Participation, Environmental Factors). The role of the clinician, as a facilitator of the clients' change process as well as the principles and underlying processes behind change, in the Lexipontix programme, are considered and discussed.



## Introduction

On their way to the therapist, clients may put the address of the clinic in their navigator but their actual destination is beyond the location of the therapist's practice. Even before they have called for an appointment, clients have placed a pin on the map towards their preferred future, towards their best hopes from therapy. The fluency specialist speech and language therapist (SLT) undertakes the task to help them move towards their expectations. In this workshop, we discuss how a fluency specialist SLT may facilitate their clients to move towards their Best Hopes from therapy within the context of the Lexipontix programme (Foullas & Marousos, 2015, 2018, 2019). A taste of the Lexipontix programme will be given; the innovative way that the Lexipontix programme addresses the overall stuttering experience of the school-age child who stutters (CWS), will be discussed.

### *Towards clients' Best Hopes.*

Following the Lexipontix Program Assessment Protocol (LAP; Foullas & Marousos, 2018), the very first question we ask our clients, even before they take their seats in the therapy room, is as follows:

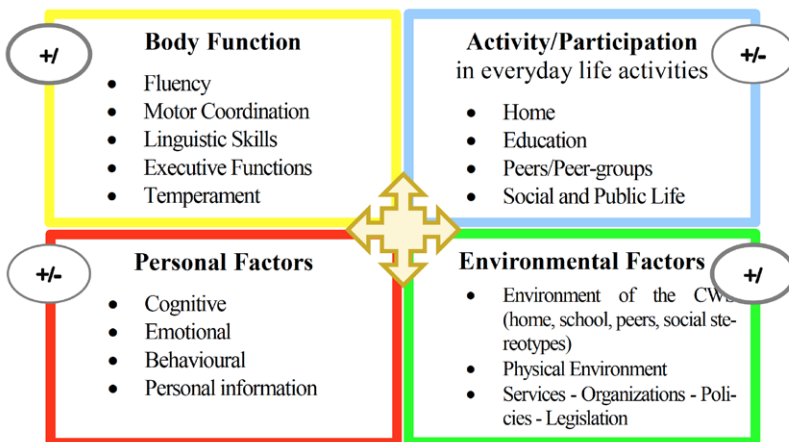
«Suppose that this is our closing session, the last session of our collaboration»:

- «what would you expect to have happened?»
- «what changes will you be pleased to notice that will tell you that therapy was successful?»
- «what changes would you expect to see as a result of our working together?»
- «what will be different at the point when therapy will be completed?»
- «what will be the outcome that you will be pleased with?»
- what else? what else? what else?

These questions are, in fact, one question put into different words, and are used interchangeably in order to elicit clients' «Best Hopes» from therapy at the beginning of the first Lexipontix programme assessment session. The question is addressed both to the child and their parents and parents are asked to express their best hopes both for their child and for themselves. The question may be

asked many times in different ways until all best hopes and expectations from therapy are expressed. It is rather expected that the most frequent response to the «Best Hopes» question is related to speech: «*to stop speaking like th-th-th-that*», «*not to block*», «*to resolve the problem with stuttering or at least to make it less*». Asking consistently «*what else, what else?*» other responses are often revealed: «*to be more confident*», «*not to be teased*», «*for stuttering not to hinder her life*».

The second question, the one that follows the «Best Hopes» question, according to the LAP, asks for the client to describe what difference the fulfillment of their best hopes, will make. «Suppose that your best hopes are fulfilled and all you described previously has become real, you stutter less, and you are more confident, what difference would that make?» or... «when this happens, the time that you will stutter less and be more confident, what difference would that make?» The «what difference would that make...» question, often elicits responses that help the client consider therapy outcomes other than those directly related to speech. Clients often describe changes related to the cognitions, emotions and behaviours, as well as changes related to the environment, to everyday communication, activity and participation, and quality of life: «*to make new friends*», «*to read aloud in the class without fear*», «*to feel confident*», «*to say what I want to say*», «*to know what I can do to help my child as a parent*», «*to have less anxiety*».



There is very little research on the clients' «Best Hopes» related to stuttering therapy. Landau (2011) conducted a small-scale retrospective study to explore the experiences and expectations of 13 to 19 years old CWS and their significant others. Findings reported that CWS's priority for therapy was fluency (100%) whilst significant others considered confidence building (50%), self-esteem raising (70%) and meeting other people who stutter (60%) as their priorities. A qualitative study conducted at the Michael Palin Centre (Berquez, et al, 2014) aiming to explore what 10- to 14-year-old children who stutter, and their parents, expect from therapy and whether their hopes are aligned. Thematic analysis of their responses showed that, in terms of expectations, there were several common themes that emerged across groups such as 'cognitive', 'affective skills'; 'speech'; 'social support' and 'socialization'. There were also areas of difference. Parents identified hopes that the children did not mention in terms of knowing more about their child's stuttering, understanding better what their child needs and family factors such as working together and a more relaxed household. Findings of those two studies demonstrate that: (a) there are commonalities between children's and parents' best hopes from therapy but differences as well (b) best hopes are primarily but not exclusively related to speech (c) best hopes may refer to all components of the International Classification of Functioning Disability and Health (ICF) (WHO, 2001) classification, implying that stuttering therapy should address the needs of the child and the family in a holistic perspective.

Based on the adaptation for stuttering by Yaruss and Quesal (2004), the ICF classification has been widely used as a framework in the treatment of stuttering. In the Lexipontix Program, we further adapted the ICF classification in what we call «The Formulation Chart» (Fourlas & Marousos, 2018). The Formulation Chart is an evidence based, dynamic working model for assessing, mapping, interrelating and understanding stuttering-related data of the CWS and their family. There are four interrelated categories in the Formulation Chart: Body Function, Personal Factors, Activity and Participation and Environmental Factors. (Figure 1). Based on research, within each of the four categories, distinct subcategories are listed. Data related to fluency, motor coordination, language skills, executive functions and temperament are recorded under the Body Function Category. Cognitive,

emotional and behavioural responses of the child related to stuttering as well as other personal information that may facilitate or inhibit communication are placed in the Personal Factors field of the Formulation Chart. Information related to the impact of stuttering in everyday life activities of the child and family is recorded in the Activity and Participation field and information related to the close or broad environment of the child as well as to policies, services and legislation are placed in the Environmental Factors. According to the LAP, formal assessments such as OASES (Yaruss, et. al, 2010) , CAT (Vanryckegehem and Brutten, 2020), Palin PRS (Millard and Davies, 2016), informal assessments and structured interviews are administered in order to collect information on all the fields of the formulation chart.

By the time they refer themselves to the therapist, clients have already covered part of the route towards their best hopes. They have had moments of success in the management of their stuttering in a way that has helped them deal with the demands of their everyday life communication, before they have come to our clinic. The therapist uses the Formulation Chart (Foullas & Marousos, 2018) as a tool for exploring the child's abilities, strengths and challenges; for establishing common understanding of the clients' stuttering experience; for mapping possible routes towards best hopes and for making joint decisions with the clients on treatment and treatment planning.

### **How the lexipontix programme addresses clients' «best hopes» from therapy**

Taken from the linguistic terms 'Phonemic' and 'Phonetic', the words 'Emic' and 'Etic' are used in anthropology and the social and behavioral sciences, in order to refer to two kinds of field research and perspectives: (a) Emic, from within the social group (from the perspective of the subject) and (b) Etic, from outside (from the perspective of the observer). Emic knowledge and interpretations are those existing within a culture, that are 'determined by local custom, meaning, and belief' (Ager and Loughry, 2004) and best described by a 'native' of the culture. Etic knowledge refers to generalizations about human behavior that are con-

sidered universally true, and commonly links cultural practices to factors of interest to the researcher, that cultural insiders may not consider very relevant (Morris et al., 1999). Considering those concepts in relation to therapy one may argue that the Emic, the perspective of the client, is subjective and experiential, focuses on individual differences and on the uniqueness of each case. The Etic, an outside perspective, is objective, looks for common behaviors and trends across cases and emphasizes similarities rather than differences. The Emic perspective is best served by practice-based evidence clinical practices, using the ICF classification in assessment and treatment and by the contextual, the psychosocial models of therapy, focusing on the expert person. Whereas, the Etic perspective corresponds to evidence-based practice, a symptom-based classification of disorders such as ICD-11 and the medical model of therapy with the clinician being the expert. The complementarity of Emic and Etic approaches to anthropological research has been widely recognized (Xia, 2013), and one cannot argue differently in stuttering therapy. In stuttering therapy, for example, SLTs use evidence-based clinical practices, but practice-based evidence practices too. SLTs follow structured programmes but also critically adapt therapy to the clients' needs. But, is it the right balance that helps clients to reach their best hopes and makes a therapy approach effective for each client?

Research over the past 30 years on the effectiveness of psychotherapeutic treatments has continued to support the -so called- «the dodo effect», that all bona fide psychotherapy treatments are effective. Research findings support that it is the similarities, the «Common Factors,» rather than the differences between approaches that account for the observation that all approaches are, in general, effective (Lambert & Bergin, 1994; Imel & Wampold, 2008; Zebrowski, 2012). The Common Factors between approaches are: (a) the «Therapeutic Relationship», the strength of the therapeutic alliance between the therapist and client, that accounts for 30% (b) «Extra-therapeutic Factors,» the resources of the child and family, that accounts for 40% (c) «Technique» i.e. evidence based, theoretically oriented, therapeutic methods, strategies, or tactics, that accounts for 15% (d) «Hope and Expectancy» i.e. how much the client becomes hopeful and believes in therapy, that also accounts for 15%.

*How Common Factors, Best Hopes, Emic and Etic perspectives are related to the Lexipontix programme*

The Lexipontix programme adopts an inside, an Emic, perspective to therapy in the sense that it:

- elicits clients' «Best Hopes» from therapy and encourages the child and his parents to move towards them (George, et al., 2013),
- addresses the overall stuttering experience of the child and family and individualizes therapy according to the overall needs and expectations as well as available resources,
- builds therapeutic relationships, engaging the child, his family and significant others and makes best use of the expertise of each participant,
- focuses on solutions, on the successful part of the clients' experience of life, communication and therapy,
- is brief and minimal, facilitates decisions that bring about the biggest possible change in the shortest amount of time, making optimal use of the resources of each family and child.

On the other hand, for achieving the above aims the Lexipontix programme adopts an Etic perspective in that it:

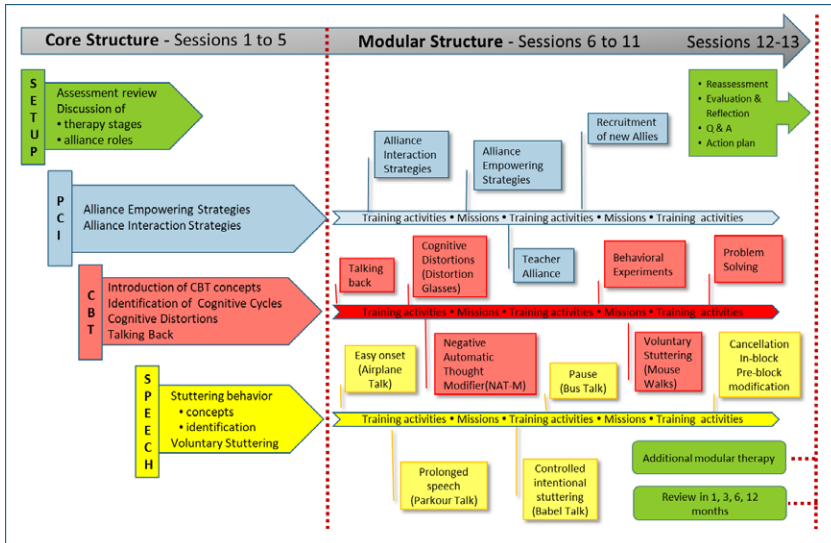
- combines well known theories and clinical practices that are commonly used and have been proved effective in Stuttering Therapy: Parent-Child Interaction (PCI) therapy (Eyberg et al, 1999; Kelman & Nicholas, 2008; 2020), Cognitive Behavioural Therapy (CBT) (Beck, 1967a; 1967b; Beck, 1995) and Speech Control techniques - both Stuttering Modification (Van Riper, 1971; 1973) and Fluency Shaping (Ingham & Andrews, 1973)
- merges all different clinical practices into a coherent whole; a programme with a structure that is supported by manuals and clinical material.

### **Key elements of the lexipontix programme**

The Lexipontix programme introduces therapy as a role play game based on a theme. The protagonists in this game are the child in the role of a Superhero, who tries to defend his Factory of Mind, and a naughty

mouse called *Lexipontix*. *Lexipontix* tries to intrude or invade the Factory of Mind and Sabotage the Factory Machines. The child is empowered with Allies and Tools and is involved in Missions and Experiments in order to deal with the activity of *Lexipontix*. There are four interrelated Factory Components that work synergistically in communication: The Machine of Thoughts, the Lab of Emotions, the Body Sensors and the Machine of Actions and Words. The Factory is regulated by the Control Centre which is the central control panel of the Factory of Mind. It continuously receives and sends information, keeping all Factory Components in equilibrium. Stuttering occurs when *Lexipontix* attempts to intrude into the Factory of Mind, Sabotages any of the Factory Machines or Invades the Control Centre of the Factory. The child defends his Factory of Mind equipped with Blue, Red and Yellow Tools. These are Alliance tools, tools for thoughts and emotions and speech tools, respectively (Fourlas & Marousos, 2019; in press). By introducing therapy as a role play game based on a theme, using child friendly material, enjoyable activities and card games, Lexipontix programme personalizes therapy and makes therapy meaningful and fun. The child gradually experiences a rationalized and harmonious relationship with his stuttering and stuttering is not a worrying threat anymore.

Therapy develops in two phases: Phase A lasts for 13 weeks (Fig.2). Before the end of phase-A, in session 12 and 13, progress is assessed, and additional therapy is recommended if necessary, as Phase-B. If there is no need for further therapy, follow up sessions are scheduled in 1-, 3-, 6- and 12-months post therapy. Phase A consists of a 'Core Structure' and a 'Modular Structure'. The 'Modular Structure' consists of several optional 'Modules'. 'Modules' are distinct entities of inter-related clinical tools and practices adjacent to the 'Core Structure'. Specific modules are differentially activated in each case, according to individual needs, as depicted in the Formulation Chart. Modules are optional; only the modules that are expected to make the biggest change are activated. The 'Modular Structure' allows the programme to be highly flexible and minimal. Modules and tools are color coded and each color corresponds to one of the three components of the Lexipontix programme namely the Alliance Component, the CBT Component and the Speech Control Component.



Based on Parent Child Interaction Therapy principles, special times are introduced from day one. Special times help the child and his family to identify their potential and also help the therapist to get additional information on individual strengths, family dynamics and family communication at an early stage of the programme. 'Alliance Interaction Strategies' (such as giving time) and 'Alliance Empowering Strategies' (such as praise) prepare the ground for family board games and strengthen the 'Alliance' relationships. They also build a safe and desensitized environment for practicing 'Yellow Tools' and 'Red Tools' (i.e., 'Tools' for speech and 'Tools' for thoughts and emotions, respectively).

Further on in the programme the child is empowered to recruit more members in the 'Alliance', expanding the 'Alliance Network'. The 'Teacher's Alliance' module is also activated quite often to help the child to educate his schoolmates and the staff of the school and to create a positive and desensitized school environment.

Using CBT principles, many games and therapy activities have been developed as autonomous clinical tools and modules in the Lexipontix programme. The CBT tools that are activated in the Core Structure are:



(a) Identification of feelings and attitudes (b) Identification of Negative Automatic Thoughts (NATs) (c) Identification and challenging of cognitive distortions (d) Initial processing of NATs by means of «Talking Back». The CBT tools that are activated in the modular structure are: (a) Voluntary Stuttering (b) Problem Solving (c) Behavioral Experiments (d) Talking Back (e) Reframing of NATs by means of modification. The selection of modules is a clinical decision and is activated to cover individual needs. For example, problem solving may be activated to deal with bullying at school; behavioural experiments are used to challenge cognitions; reframing of NATs by making use of the NAT-Modifier Tool, may be used to deal with increased anxiety while practicing a speech tool in real life communication.

The Speech Control Component of the Lexipontix programme include both Fluency Shaping and Stuttering Modification techniques. The Lexipontix programme aims at «Functional Speech Control» i.e., speech techniques to be used on purpose, in order to produce meaningful results, to serve certain communicative demands and to enhance functional communication. For example, the easy-onset/soft-contacts technique may be used in order to increase the level of control the child has over the initial phoneme of the word, to increase confidence and to gain adequate proprioceptive feedback at a level that allows controllable realization of the whole phrase. The purpose served by this different way of moving the articulators is for the child to be able to read aloud in the class. Therefore, according to the ICF classification, the child, by controlling body function and personal factor parameters, makes a change in activity and participation. Applying the «minimal-sufficient-effective» criterion used in the Lexipontix programme, therapists only select the technique/s that are sufficient to make the biggest difference in a child's communication, making best use of the resources of the child and their system.

*Lexipontix Program: it's all about technique and nothing about technique*

Considering the Lexipontix programme in Etic terms, it is the «technique», the structure of the programme, and its modules, that contribute to the programme's effectiveness in helping clients to fulfill their best hopes

from therapy. The structure of the Lexipontix programme: (a) provides a framework, criteria and a timeframe for assessment and treatment (b) includes an evidenced based therapy plan and therapy material for each session (c) incorporates evidenced based clinical tools for assessment and treatment (d) provides a manual, guidelines and clinical rationale for all clinical tools (e) ensures predicted and measurable outcomes (Foullas & Ntourou, 2021; Foullas, Spyridis, Batzifoti, 2021) (f) allows the programme to be repeated in a uniform way (g) offers security and confidence to the clinician.

Considering the Lexipontix programme in Emic terms, the «technique», is not the catalytic factor in helping clients to fulfill their best hopes from therapy. Think about the Lexipontix programme as the structure plan of a city, as the organized space where therapy happens; a place where clients interact with «technicians» of change (George, 2021), taxi drivers, skilled in helping people to get to where they want to go in their lives, as quickly as is possible. «Technicians» are skilled in helping people to interact in a novel way with therapy «material»; to consider possible options, alternative routes, new perspectives; to try things out, creating new knowledge and making new, better, sense. «Technicians» who facilitate the process of change by acknowledging peoples' expertise on their lives; by helping people focus on exceptions, on differences, on the successful part of themselves and by making best use of their available resources. Under this consideration therapy is in what is happening in the city, not the city per se. Steve de Shazer said that 'Solution Focused Brief Therapy' is on the one hand all about technique and on the other nothing about technique' (George, 2021). Copying this saying for Lexipontix, Lexipontix is on the one hand all about technique and on the other, nothing about technique'.

## Conclusions

The Lexipontix programme is considered as a structured and holistic therapy programme for school age CWS. But if were to give a group of skilled and experienced clinicians 'all about technique' i.e., a thorough list of all the questions asked, all the clinical tools used in the Lexipontix pro-

gramme and the session-by-session list of actions included in the Lexipontix programme manual, and sent them off to meet their first client, how likely is it that, what they did in that session would fit with our understanding of Lexipontix? If clinicians stick to «all about technique», to the 15% of the common factors that corresponds to the factor «Technique», the most prominent answer may be that the session would not look like our understanding of the Lexipontix programme. If this is the case, then it might be interesting to reflect on the ‘nothing about technique’. The Lexipontix programme requires a changed ‘mindset’ or perhaps as Evan George describes for SFBT «*a different way of listening to our clients*» (George, 2021). Lexipontix proposes a different way of listening to the school age CWS. A different mindset not a different set of tools.

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## TREATMENT AIMS AND OUTCOMES USING «PLAY!» IN YOUNG CHILDREN WHO STUTTER

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### Introduction

Stuttering is a fluency disorder characterized by an early onset, between the ages of 2 and 3.5 years (Yairi and Ambrose, 2013). While approximately 85% of children spontaneously recover (Yairi and Ambrose, 2013; Bloodstein and Ratner, 2008; Dworzynski, 2007), there is a large percentage of persistence. Therefore, it appears fundamental to take into account the risk factors in the assessment phase, such as: familiarity, gender, age of onset, duration since onset, and phonological abilities.

Scientific research in the field of preschool stuttering has shown that this disorder has a significant impact on the individual and the family as early as preschool age (Humeniuk, Tarkowski, 2016; Langevin et al., 2010; Plexico and Burrus, 2012; Lau et al., 2012). It is during the early preschool years that children begin to build self-perceptions in respect to their communication skills. Studies on the awareness in children who stutter have shown that stuttering and non-stuttering children are able to recognize the presence of a difference in their speech as early as preschool age (Ambrose & Yairi, 1994; Ezrati-Vinacour, Platzky, & Yairi, 2001; Griffin & Leahy, 2007). These studies allow us to analyze how increased awareness is closely linked to the onset of a negative attitude toward the disorder.

It is during this phase that children begin to consider their communication skills worse than their peers (Vanryckeghem, Brutten, & Hernandez, 2005) and to implement response behaviors: asking for help, stopping talking, changing posture, having emotional reactions of anger or crying (Boey, 2009). Thus, a negative communicative attitude begins to develop.

In addition to the impact it has on the child, the onset of stuttering also has a negative impact on the family and parent-child communication exchanges (Humeniuk, Tarkowski, 2016; Langevin et al., 2010; Plexico and Burrus, 2012; Lau et al., 2012). It has been observed that once children are diagnosed with the disorder, their parents begin to feel more anxious, insecure, and perceive a sense of guilt (Langevin, 2010). This leads them to change their attitudes and ways of interacting with their children (Humeniuk, Tarkowski, 2016). Studies have analyzed different behavioral reactions that parents implement towards children: they ask for air, reduce time pressure, increase eye contact (Plexico and Burrus, 2012), sometimes correct their child, show impatience, and finish sentences (Humeniuk, Tarkowski, 2016). This can then go on to generate ambiguous and ineffective communicative exchanges, leading to increased disfluencies (Langevin et al., 2010; Onslow & O'Brian, 2013; Plexico and Burrus, 2012; Lau et al., 2012).

On these theoretical foundations, the research group of CRC of Rome developed the program Play!

### **The play! programme**

Play! program is a direct and integrated stuttering treatment program, involving children aged 2-6 years and their parents.

It has been designed as a program aimed to desensitize the patient and family to stuttering, promote open and calm communication about their characteristics, and implement emotion recognition and problem-solving skills. The program also aims to provide tools to implement the identification and modification of disfluencies, providing a communicative experience permeated by an atmosphere of serenity and fun.

The duration of the intervention is 4 months, with meetings twice a week and parental counseling meetings once a month. The therapy sessions take place once a week in groups with other children and once a week individually with the involvement of the parents.

Play! program is characterized by 4 phases:

### *Phase 0*

Treatment in the Play! program starts from the first meeting, carried out by a speech therapist expert in stuttering, who meets the child and the family. The orientation interview (Bastianoni and Simonelli, 2002) is informative and an analysis of the demand. It is conducted keeping alive and prioritizing the interest in the resources and potential of the child and those who take care of his/her growth. Through the exploration of what is narrated, it is in fact possible to:

- identify the motivations behind the consultation;
- observe the child and the parent's communication and relational skills;
- identify the presence of negative awareness of the child and the parents;
- observe the child's temperament characteristics;
- gather information on the communication dynamics between child and parents;
- identify any parental concerns;
- inform and support young patients and their parents about stuttering.

Useful tools will be provided in this phase to the child and parents to identify and manage reactions related to stuttering.

### *Phase 1*

The next phase is dedicated to the evaluation of the patient and family. This phase involves the participation of a multidisciplinary team and has as its objective not only the formulation of a nosographic diagnosis according to the main international classification systems, ICD-10 and DSM-5, but especially the collection of more information about the child's communication-linguistic skills and his/her experience with stuttering, as well as the making of a more in-depth analysis of environmental factors.

In particular, a careful analysis will be made of the reactions of the child and the family to stuttering, as well as the level of emotional activation that the disorder generates in both.



The evaluation process is always based on the ICF-CY model, thanks to which clinicians can draw up a profile of the patient's functioning that can guide the treatment.

### *Phase 2*

As previously exposed, the treatment is characterized by two weekly meetings, one of individual therapy and one of group therapy. These two modalities allow us to work on: desensitization, identification and modification of stuttering.

Desensitization is done mostly within the group meetings. The child is guided to experience his stuttering in a positive way in different conversational situations, to develop irony and self-irony to be used both with peers and within the family.

Instead, it is during the individual sessions that the child learns more about stuttering, his own stuttering, the types of disfluencies and then how to recognize them in his/her case. In the individual meetings great importance is also given to body awareness of disfluencies. The child learns not only to recognize stuttering, but also thoughts and emotions related to it.

The use of PLAY! both in individual and group sessions will then support the child and family in the process of changing thoughts, emotions and reactions related to episodes of stuttering, as well as support the child in the process of activating problem-solving skills to be used in different communication situations.

### *Phase 3*

Phase 3 is characterized by final assessments and results monitoring over time.

At the end of the program, an analysis will be carried out to identify the beneficial effects of the treatment in terms of fluency, and especially in

terms of change of thoughts, emotions and behaviors implemented by both the child and the family towards stuttering.

In order to monitor the stabilization and generalization of results, the PLAY! program schedules two successive reassessment moments: at 6 months and at 12 months.

### **Play! tools**

We can select three different tools that are used in the Play! program: the cartoon, the fairy tale and the game.

#### *The Cartoon*

It was conceived and designed as a tool to be used in PHASE 0.

From scientific research, we know that the negative attitude towards stuttering grows proportionally with the awareness of the disorder. Therefore, it is of fundamental importance to have a tool that can be used early on to work on this aspect. The cartoon has many useful features for this purpose, such as:

- the use of images simplifies the understanding of issues that for a young child would be complex;
- it allows us to represent emotions and reflect on them;
- it has a great identifying power of mirroring in the characters of the stories, thus allowing it to activate problem-solving processes.

The use of the fantasy world, evoked by the cartoon, allows the child and his/her family to identify with situations related to reality in an indirect and motivating way and therefore to deal with sometimes complex topics, such as:

- talking openly about stuttering;
- helping in the recognition of stuttering and secondary behaviors activated;
- working on the recognition and regulation of emotions.

Therefore, the cartoon is a first tool to be used early, before treatment, and its objective is mainly preventive. It does not replace other tools, but integrates them.

### *The Fairy Tales*

The use of the fairy tales represents a fundamental element of the program. Listening to the story allows the development of «narrative thinking» (Bruner, 2002).

Fairy tales contribute to the psychological development of children in different areas: linguistic, social and emotional. When a child listens to a fairy tale, he/she learns new vocabulary and many other linguistic elements; he/she discovers positive or negative relational modes, he/she becomes emotionally involved in the lives of the characters and in the description of their emotional experiences, which he/she can identify with (Bruner, 1992).

The tales presented were thought out and designed for the therapeutic program (Tomaiuoli, 2009).

The fairy tales used are set in a fictional village, the characters of these fairy tales are puppies with human characteristics on which the stories develop such as, stammering, having an irrepressible personality, being shy or plump.

The anthropomorphic puppies face many difficulties that force them to experience the acceptance of their own features. The dramatization encourages the child to recognize the emotions in the character and connect them to different situations. Through the dramatization of the fairy tales, the child is led into a problem-solving process, in which he/she can express his/her own opinions and deal with the consequences.

### *The Game*

The game is the basic tool of the program. We are convinced that only through a stimulating setting, the child is able to analyze, experiment and then acquire skills that are useful to him. Moreover, it allows us to convey information, to identify and therefore to work on the change of thoughts

and emotions linked to stuttering, but in a way that is appropriate to the age of the children and, above all, fun.

The characters identified in the stories are the main protagonists of the proposed play activities.

For instance, the game of indirect and direct dramatization allows us to work in a pragmatic and fun way on the characteristics of each character, experiencing them firsthand.

### Objectives of the play! program

The primary objective of the program is to provide the child and parents a communicative experience permeated by an atmosphere of serenity and fun, in which they have the opportunity to express their needs and emotions with complete freedom.

Through the activities proposed by the program, the child and the family will learn more about stuttering in general, as well as how to identify and recognize what happens when the child stutters.

The child will be able to acquire effective verbal and behavioral models, expanding the use of different types of communication (nonverbal and paraverbal).

Activities are intended to support and expand problem-solving skills and the use of irony and self-irony.

The goal is to reduce the cognitive, emotional and behavioral reactions of both parents and children to stuttering and therefore promote a serene atmosphere within the child's environment.

### Play! program structure

<b>Parent's informative counselling</b>
<p>Parents receive general information on childhood stuttering, on the possibilities of spontaneous remission, on the effectiveness of early intervention and on the different types of direct and indirect interventions.</p> <p>We share information about the child's stuttering and explain to them the application of the treatment program for their child and the level of parental involvement.</p>

<b>Tale of a fairy tale and choice of ending (problem solving)</b>
<p>Presentation of the world and the characters of Igloolandia: children and parents are introduced by the speech therapist to get to know the setting of the fairytales, its inhabitants and their physical and character characteristics.</p> <p>During the story the child is invited to reflect on the characteristics of the character by identifying them and trying to reproduce them. During the telling of the story the child will also have to engage to engage his problem-solving skills and bring the characters to a conclusion. Both child and parents have to try to identify their own and the character's difficulties and experiment managing their own and those of the character.</p>
<b>Undirect acting play</b>
<p>We focus on interpreting the character with his characteristics, his thoughts, emotions and his way of reacting.</p> <p>The indirect dramatization involves everyone helping to experiment with different roles and verify the consequences of the management chosen by the character.</p> <p>At this time the therapist helps the child to identify their difficulties by experimenting with some disfluencies management strategies.</p>
<b>Direct acting play</b>
<p>Both children and parents can experience different ways of acting their thoughts and feelings with different roles.</p> <p>Direct acting play helps everyone to verify the feeling of experiencing the benefits of changing their thoughts and feelings as well as the way to react and manage difficulties.</p> <p>Direct acting allows children to check the emotions of the character and the differences in feelings related to the double ending.</p> <p>Also, the final double helps children and parents to test and verify the different thoughts and emotions that may arise depending on the final that you choose.</p>

## Conclusions

Play! is configured as a preschool intervention program for children who stutter between the ages of 2 and 6. The program is focused on the importance of an integrated, direct and indirect approach. The objective is to provide correct information, modify thoughts, emotions and behaviors related to stuttering, both of the children and of the environment that

surrounds them. The program includes tools such as the cartoon, the fairy tales and the game to promote a stimulating and fun environment in which the child and family can prove themselves in a positive way. This would make it possible to prevent the onset of a negative experience of stuttering and a better management of the children's communicative effectiveness.

Currently, we are in a phase of data collection, to demonstrate the effectiveness of the program in a sample of children aged between 2 and 6 years. Data on the outcome obtained from the use of this method will be published shortly.

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**MINI-KIDS: DIRECT THERAPY FOR YOUNG CHILDREN WHO STUTTER**

Veerle Waelkens

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Mini-KIDS is described in this paper. Background, main principles, techniques as well as the phases of the approach are illustrated and underpinned with evidence or research.

**Content**

Mini-KIDS is a direct treatment based on principles of desensitisation and stuttering modification. Pseudo-stuttering, that is, deliberate stuttering, is one of the main components, as a technique but also as a goal in the different phases of the approach.

The concept of Mini-KIDS (and KIDS) was based on Carl W. Dell's approach. Carl W. Dell was a student of Van Riper. He transformed adult therapy into a workable form for children, according to Van Riper (1972) (Dell, 1979, 2001). The huge merit of the approach of Dell, is that he promoted discussion about stuttering with the child and at the same time addressing the stuttering directly through stuttering modification (Sandrieser & Schneider, 2015). The environment (parents and the wider environment such as teachers) of the child is strongly involved in the treatment. Before, clinicians feared increasing the burden in children by increasing awareness. That turned out to be unfounded.

The concept and structure of the therapy according to Dell is the fundamental starting point for the therapy concept of KIDS 'KInder Dürfen Stottern', which was developed for two age groups (Sandrieser & Schneider, 2015):

- KIDS: primary school children older than 6 years;



- Mini-KIDS: young children between 2 and 6 years.

Kindern Dürfen Stottern stands for ‘children are allowed to stutter’ (Sandrieser & Schneider, 2015). It is allowed, they may stutter, it is tolerated. This tolerant attitude refers to both acceptance by parents and the child itself. Mini-KIDS is derived from the therapy concept KIDS (‘Kindern Dürfen Stottern’, Sandrieser & Schneider, 2015) for school-aged children. The main components of Mini-KIDS are supported by evidence. Evidence to support the necessary metacognitive and metalinguistic skills to work directly on desensitization, identification, and modification of stuttering-like disfluencies in this young age group by means of pseudo-stuttering is found in several publications, e. g. Arias and Diaz (2010) and Hakim and Bernstein Ratner (2004). Evidence to argue for desensitisation in treatment for CWS can be found in Johnson et al. (2012), Karrass et al. (2006) and Prins et al. (2011). For direct work with the modification of speech motor loss of control in young children, evidence is found in research on brain function and motor speech development (e.g., Bohland et al. 2010; Galantucci et al. 2006; Guenther, 2006; Olander et al. 2010). Mini-KIDS as an entire program, however, is not yet supported by research-based evidence, only practice-based evidence. Parents are intensively involved.

Mini-KIDS is also based on ‘The 3-factor model for triggering moments of stuttering according to Packman and Attanasio, 2010’. Packman (2014) states that the predisposed neurological instability or sensitivity is triggered by linguistic complexity and paralinguistic characteristics of the conversation and by modulating factors (intrinsic and individual factors: arousal for example). This model is used for clinical reasoning when weighing goals for direct and/or indirect influencing.

Key-concept and goal of Mini-KIDS is to develop a functional coping style: children and their parents ‘dare’ to stutter, and they ‘can’ stutter. Of course, we aim at recovery in the first place with this therapy concept. But one of the strengths of KIDS and Mini-KIDS is that the therapy is also successful when the child persists in stuttering after therapy. The ultimate goal is that the children ‘are allowed’ and ‘are able to’ stutter if they do not overcome stuttering.

- ‘Are allowed’: they do not resist and dare to stutter openly and unrestrained
- ‘Are able’: they have the skill to stutter self-confidently and in an easy way

Because the tolerance is addressed and the stuttering becomes negotiable for the child and his environment, many reinforcing and persisting factors will disappear, whereby the severity and shape of the stuttering will change. The fact that children dare to stutter (that they allow their moments of stuttering) is achieved through desensitization, information about stuttering, insight into stuttering and the reduction of feelings of helplessness, shame and guilt. 'Being able to stutter' means the child experiences that s/he can influence and control the motor course of the moments of stuttering, and thus can make the moments of stuttering easier. The child discovers that s/he has a choice. There is an interaction between 'allowance' and 'ability': partly because of the experience to get a grip on moments of loss of control, the emotional load decreases and the tolerance increases. On the other hand, increasing tolerance opens possibilities to 'do' something helpful. The functional coping style ensures that the remaining stuttering does not hinder the child in activities, in the field of participation, in personal development or in the development of functions. Setting this goal is not an emergency solution, but a pragmatic and well-considered choice: unrealistic expectations in the environment and/or attempts by the child to fight against stuttering are a major risk for the further development of stuttering by developing non-helping coping strategies and a negative perception and connotation of speech as part of this coping strategy. Non-helping strategies and such a negative connotation result in increasing limitations in the long term in all domains of human functioning (ICF, WHO).

When appropriate and feasible, the risk factors (external and/ or internal) are dealt with as much as possible. Think about limited or deficient problem-solving skills, speech development disorders or an imbalance in the speech and/or language development, language formulation problems... This is in line with what is called 'reinforcing skills' in the RESTART-DCM method (Franken & Putker, 2012).

The therapist discusses the goals and the chance of recovery transparently with the parents, based on knowledge and insights, theoretical framework and scientific evidence. This way, parents can agree on a well-informed foundation and consciously choose Mini-KIDS or another therapy approach. The therapist gets the mandate from the parents to work with the child.

The assessment procedures are not the scope of this paper and are elaborated in the book 'Mini-KIDS, Direct Therapy for Young Children Who Stutter (2-6 y). Theory, Method, Materials (Waelkens, 2018).

### **Phases and procedures in mini-kids**

Sessions are scheduled individually, with CWS and his/her parent(s) alone. Once a mandate is negotiated, Mini-KIDS for 4-6-year old children consists of four stages: Stage 1 = desensitization, Stage 2 = identification, Stage 3 = modification and Stage 4 = generalization. The program for 2-4-year-old children does not include stage 2 (identification). SLT and parent(s) are the speech models for the CWS. They add normal disfluencies and pseudo-stuttering to their speech at first to make sure the CWS dares to stutter and the CWS as well as the parent(s) are desensitized to it. Later in treatment and if necessary, CWS learn to recognise and alter their stuttering moments.

#### *Mandate*

A mandate is formulated with both parents. The mandate specifies the treatment expectations, achievable goals and the requirements for parental involvement. Also, with the CWS, a mandate is formulated on the developmental and linguistic level to inform him/her about what is going to happen. This mandate sets a positive working relation between SLT, the parent(s) and the CWS.

#### *Desensitisation*

SLT, parent(s) and CWS gradually learn 'to dare' to pseudo-stutter. For the CWS, the goal is to use all relevant types of pseudo-stuttering (relevant = what is present in the CWS' speech). For the parent(s), apart from daring to pseudo-stutter, it is also important that

they perform this technically correctly (without tension and concomitant behaviours). The parent(s) may need separate parent sessions. The CWS' and the parents' experiences and emotions of using the pseudo-stuttering are gradually openly named and discussed. Tangible tokens can be used to visualise the pseudo-stuttering, such as a jumping frog («co-co-come here») or a snake («sssssssoon you can play»). The aim is to desensitise parent(s) and PCWS for stuttering, to make stuttering a topic for discussion (no taboo) and to make sure parents use the pseudo-stuttering. The CWS daring to pseudo-stutter is a prerequisite for identification (Stage 2). It (often) happens that because of the desensitisation, the stuttering has recovered, frequency drops are observed, or only short and easy moments of stuttering remain. In this case there is no identification (Stage 2) and no modification phase (Stage 3). CWS and parents move on to phase 4 (generalization).

### *Identification*

This stage is only for children of  $\geq 4$  years as it requires sufficient metacognitive skills. The CWS and the parent(s) identify and discriminate the relevant types of stuttering and the relevant qualities during games with a gradual increasing linguistic and emotional level. First in the pseudo-stuttering of the SLT, later also in the pseudo-stuttering of the parent and CWS. In the end, the CWS identifies real moments of stuttering in his own speech. It is taken care of that there is no new 'sensitisation' (i. e., an increased awareness linked to negative feelings such as concern).

Once the CWS 'is able' to identify and discriminate between these types, the quality that hinders communication (duration or tension or both) is introduced as well. Again, tangible tokens facilitate this process (a hard snake and a soft snake for tensed versus easy loose prolongation; long and short snake for prolongation with long duration versus short duration). Only relevant types and qualities of stuttering are aimed for.

The CWS is ready to proceed to Stage 3 if s/he identifies and discriminates relevant types and qualities of real stuttering in his/her own speech. This does not have to be 100% correct and mainly on long and tensed

moments of stuttering. The parent(s) is ready to move to Stage 3 if s/he easily produces each type of stuttering behaviour in pseudo-stuttering with a positive attitude and discriminate these adequately in the speech of the CWS.

For the CWS < 4 years, only the parent(s) learns to identify and discriminate in individual sessions or in a parent group. In this age group, the parent(s) is ready to move to Stage 3 (modification) if s/he easily produces each type of stuttering behaviour in pseudo-stuttering with a positive attitude and discriminate them adequately in the speech of the CWS. If by now the stuttering has recovered or only short and easy moments of stuttering remain with declining frequency, there is no modification phase (Stage 3) and CWS and parents move on to phase 4 (generalization).

### *Modification*

For CWS < 4 years: The parent(s) models easy ongoing pseudo-stuttering in his/her speech. The modification of the stuttering moments occurs gradually and spontaneously. Stuttering moments become less tense or shorter. In some CWS, this is only possible if the SLT and parent(s) show them how to loosen tension via pseudo-stuttering, but that is not necessary for all CWS.

For CWS  $\geq$  4 years: The knowledge and skills of the identification phase (Stage 2) are used here to try to alter a moment of stuttering that hinders the CWS. The CWS is in command of this, the parent(s) does not ask for modification. It is advised that here, the CWS teaches this to his/her parent(s), so s/he feels in control. First this is trained with pseudo-stuttering. Again, tangible items can be used to visualise the features of the stuttering behaviour such as a soft toy. The SLT and the parent(s) experiment with their own speech (model soft and hard, long and short, easy and difficult stuttering moments). Gradually, the CWS will apply this to real moments of stuttering. Parents gradually withdraw and leave the PCWS in charge. Goals of Stage 3 are achieved if, gradually, there are more easily achieved short moments of stuttering, frequency drops in stuttering moments or recovery of stuttering is observed in the CWS' speech.

### *Generalisation*

Parent counseling is the most frequently used technique. The SLT seeks topics that the parent(s) is still unsure about or topics that need more information or training. The parent(s) evolves to an independent speech model for his/her CWS. Recovery, or low, frequency and no reactive behaviour over a long period is the goal of Stage 4. The parent(s) and CWS report that they feel competent and successful to deal with fluctuations in the left-over stuttering, if any.

### *Maintenance phase*

The maintenance phase starts when the CWS and parent(s) achieve the goals of Stage 4. Clinical visits to monitor if achieved goals are reached and scheduled with an interval of 4, 4, 8, 8 and 16 weeks.

### **Discussion**

Relevant issues for discussion and clinical reasoning are when to start treatment in young CWS near to onset and whether to work in a direct or indirect way.

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## Session 5

# Other keynote lectures

In addition to its rich program, the Fourth International Conference on Stuttering was glad to also host the following keynote lectures:

- *Brain morphological development associated with eventual persistence or recovery of childhood stuttering* by Professor Soo-Eun Chang (University of Michigan - USA)
- *Rhythm and timing neural network function in people who stutter* by Professor Soo-Eun Chang (University of Michigan – USA USA)
- *Updated outcomes of the RESTART clinical trial comparing RESTART-DCM treatment and the Lidcombe program* by Professor Marie-Christine Franken (Erasmus MC Sophia Children’s Hospital – Rotterdam – The Netherlands)
- *The integration of technology in the assessment and treatment of people who stutter* by Professor Gonçalo Leal (Istutter Center – Lisbon, Portugal)
- *Does therapy satisfy children who stutter?* by Dr Sharon Millard (Michael Palin Centre for Stammering – London, UK)
- *Current research on the genetics of stuttering* by Professor Shelly Jo Kraft (Wayne State University - USA)
- *fNIRS: A hemodynamic approach to brain physiology research in children who stutter* by Professor Bridget Walsh (Michigan State University - USA)
- *Evaluating relationships among predictors of persistence in preschool children who stutter* by Professor Bridget Walsh (Michigan State University - USA)





## Session 6

# Posters

### TEMPERAMENT AND STUTTERING: COMPARISON OF THE MAIN TEMPERAMENTAL DIMENSIONS BETWEEN ITALIAN CHILDREN WHO STUTTER AND NON-STUTTERING PEERS: A PRELIMINARY STUDY

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### ABSTRACT

In the last decade research points out the need to understand factors, like temperament characteristics, that may influence the onset and the development of stuttering. Several studies showed a prevalence of specific temperamental traits in children who stutter (CWS) compared to children who do not stutter (CWNS), although there is still inconsistency on which traits characterize the temperament of CWS. This study reports preliminary results about differences in temperamental characteristics in Italian CWS compared to CWNS matched for age and gender. *Method and results.* Participants consisted of 39 children who stuttered (age range 2,5-6,11) including 29 males and 10 females, and 39 non-stuttering peers matched for age and gender. Temperament was assessed with the Italian translation

of the Children's Behavior Questionnaire (CBQ-SF, Putnam & Rothbart, 2006) a caregiver rating scale. For the CWS group, the stuttering severity was assessed using the Stuttering Severity Instrument (SSI-4; Riley, 2009). The t-test and Mann-Whitney U analysis shows a lower level of Surgency and a higher level of Guilty/ Shame in CWS compared to CWNS. Our results support the idea of differences in temperament between CWS and CWNS also in the Italian context.

## Background

Stuttering typically starts in the preschool years (Yairi & Ambrose, 2005), a critical period for children's growth. The negative consequences of stuttering may also begin in early childhood (Weidner et al., 2015) and may adversely affect the whole quality of life of those who stutter (Craig & Train, 2014; Messenger et al., 2004). Research data suggest that children who stutter may be mocked, excluded, and ignored by fluent peers (Langevin, Packman, & Onslow, 2009). Moreover, preschool children who stutter, as early as the age of 3, show a more negative communication attitude toward speech than children who do not stutter (CWNS) (Vanryckeghem, Brutton, & Hernandez, 2005). In order to work towards preventing reactive aspects such as a negative attitude and reducing the impact that stuttering could have in various domains of life (such as social life and emotional functioning) (Craig, Blumgart, & Beilby., 2009) it is necessary to understand factors that may influence the onset and the development of stuttering like temperament characteristics. Current research evidence suggests that individual differences interact with the context in a typical and atypical development (Chen, 2018). Being observed already in the first years of life, temperamental characteristics as «*constitutionally based individual differences in reactivity and self-regulation, in the domains of affect, activity, and attention*» (Rothbart & Bates, 2006) make them potentially salient in understanding the onset of stuttering and its development and severity. Several studies showed a prevalence of specific temperamental traits in CWS compared to CWNS, although there is still inconsistency on which traits characterize the temperament of CWS. Children who stutter have

been shown to be more reactive, less well regulated and more negative in effect than CWNS (Ambrose et al., 2015; Eggers & Van den Bergh, 2010; Jones et al., 2014; Zengin-Bolatkale et al., 2018). The characteristics, which have more frequently emerged, are higher negative affectivity, lower adaptability and higher attentional problems (e.g., Alm, 2014; Conture, Kelly, & Walden, 2013.) Some of these characteristics (emotional reactivity and greater negative affect) may differentiate children whose stuttering persists from those who recover naturally (Ambrose et al., 2015; Zengin-Bolatkale et al., 2018). Furthermore, it is still controversial whether in CWS temperamental characteristics are connected to stuttering severity (e.g. Choi, Conture, Walden, Jones, & Kin, 2016, Kraft, Lowther, & Beilby, 2019) or not (e.g., Eggers, Nil & Van Der Bergh, 2010).

## Objectives

According to recent literature the aim of the present study is to shed light on the relationship between stuttering and temperament in the Italian population. In particular we have explored the possibility of differences on specific temperamental characteristics between CWS and CWNS.

## Methods

### *Participants*

244 mother-tongue children (135 boys and 109 girls) aged between 2;5 and 6;11 years ( $M = 61.92$  months;  $SD = 11.31$  months) participated in the study. The experimental group consisted of 39 CWS (29 males and 10 females) with a mean age of 64.23 months ( $SD = 10.29$  months) and with a diagnosis of stuttering or awaiting a first assessment for it. To allow the comparison on temperament, the 39 CWS were age ( $\pm 4$  months) and gender-matched to a sample of 39 CWNS ( $M = 64.23$  months;  $SD = 10.51$  months) who did not report speech difficulties/disorders, stuttering and who were not waiting for a first assessment for this disorder.

### *Materials*

Temperament was assessed through the Italian version of the short form of the Children's Behavior Questionnaire (CBQ-SF; Putnam & Rothbart, 2006; Matricardi, Albiero and Cigognetti, 2010), a caregiver rating scale in which parents have to assess the accuracy of the items by referring to their child's behaviour (e.g., «My child seems always in a big hurry to get from one place to another»). In the Italian adaptation the original three-factor and 15 scales structure was replaced – for reliability reasons – by a four-factor model divided into 14 scales: Surgency (Activity Level, Impulsivity, High Intensity Pleasure and Shyness), Positive Affectivity (Smiles and Laughter, Approach), Negative Affectivity (Discomfort, Fear, Anger/Frustration and Falling Reactivity/Soothability) and Effortful Control (Inhibitory Control, Attentional Focusing, Low Intensity Pleasure and Perceptual Sensitivity) (Matricardi, 2009). Moreover, Matricardi et al. (2010) considered the extended version of the Effortful Control scale extracted from the CBQ (Rothbart, Ahadi, Hershey, & Fisher, 2001) and the Social Behaviour Scales (Additional Scales; Rothbart, Ahadi, & Hershey, 1994) which consist of five independent scales (Aggression, Empathy, Guilt/Shame, Help-Seeking and Negativity) that measure some social behaviours.

For the CWS group the stuttering severity was assessed using the Stuttering Severity Instrument (SSI-4; Riley, 2009).

### *Procedure*

The procedure differed between the two groups. All CWS were recruited and assessed in a clinical setting, where parents received informed consent, a sociodemographic form and the CBQ-SF to be completed, while the SSI-4 were administered to the children by the fluency specialist. For the CWNS group, due to the Covid-19 pandemic, data was collected in online form, using Qualtrics Experience Management (XM) software to share the CBQ-SF and the related informed consent to the concerned parents.

### Data analysis

The data were analysed using version 1.6.23 for Windows of the statistical software Jamovi. T-tests were carried out for independent samples to see whether the mean scores on the 4 temperamental factors and the individual subscales of the CBQ-SF (dependent variables) differed between the two samples (independent variable). Considering some violations of the assumptions of normality and homogeneity of variances necessary to carry out a t-test, the latter was complemented by the non-parametric Mann-Whitney U-test for independent samples.

### Results

With regard to the four temperamental factors, preliminary analysis indicated significantly lower levels of Surgency in CWS compared to CWNS ( $t(76) = 2.024$ ,  $p = .046$ ;  $U = 528$ ,  $p = .020$ ) (see Table 1). In contrast, the two groups did not differ significantly for the other factors and individual subscales of the CBQ-SF. In addition, statistically significant differences emerged between the two groups for the Guilt/Shame scale ( $t(76) = 2.550$ ,  $p = .013$ ;  $U = 514$ ,  $p = .014$ ), but not for the other Additional Scales and subscales of the extended version of the Effortful Control scale. In particular, the CWS showed significantly higher levels of guilt/shame than the CWNS (see Table 1).

Factor/scale	Group	M	SD	t-test		Mann-Whitney U
				t	gl	U
SURGENCY (CBQ-SF)	CWS	4.39	0.870	-2.024*	76.0	528*
	CWNS	4.74	0.647			
Guilt/Shame (Additional Scales)	CWS	4.96	1.005	2.550*	76.0	514*
	CWNS	4.42	0.870			

\* $P \leq .05$ .

Table 1. Descriptive Statistics And Between-Group Comparison (Independent Samples T-Test And Mann-Whitney U) Of The Cbq-Sf And Additional Scales Scores For Cws And Cwns.

## Conclusions

Our results support the idea of differences in temperament between CWS and CWNS. In particular, we found significantly lower levels of Surgency in CWS, a construct closely related to that of extroversion where low levels indicate a greater tendency towards social inhibition (e.g., Putnam, 2012; Rothbart & Bates, 2006). This result deviates from the literature according to which CWS seem to be more sensitive and responsive (e.g., Eggers et al., 2010; Reilly et al., 2013). Nevertheless, it is possible to compare some of the covert symptoms of stuttering with the social inhibition towards which individuals with low levels of Surgency tend. Very often, in fact, people who stutter tend to be more inhibited and to approach situations that elicit particular communicative apprehension with difficulty and anxiety to manifest disfluencies or to incur in negative judgments, leading to the emission of behaviours of communicative avoidance and sometimes social withdrawal for the shame of stuttering (e.g., Bernardini et al., 2009). The same interpretation can be given to the presence of statistically significant differences in the Guilt/Shame scale of the Additional Scales (Rothbart et al., 1994; adapted to the Italian context by Matricardi et al., 2010), in which CWS showed higher scores than CWNS. Furthermore, previous studies have shown that children who stutter, compared to no stuttering peers, would exhibit higher levels of Negative Affectivity and lower levels of Effortful Control (e.g., Ambrose et al., 2015; Eggers et al., 2010), whereas in the current study no significant differences emerged between the two groups regarding these two factors. A possible explanation for the discrepancies between the results of the existing literature and this study could be due to differences in the factor structure between the versions of the CBQ-SF used. Moreover, such discrepancies could be the result of cultural differences between the various samples considered in the different studies: in fact, while temperament is largely determined by genetic and biological factors, cultural background contributes by shaping its expression in terms of social adaptability and defining the sociocultural nature of the construct (Chen, 2018; Hipson & Séguin, 2015; Rothbart, 2012). However, to confirm this interpretation, cross-cultural studies adopting the CBQ-SF would be needed to compare, at preschool age, the temperament data of CWS and CWNS

of Italian and different nationalities. Therefore, further future studies could help to understand the direction of the relationship between temperament and stuttering also for a possible clinical utility.

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## THE ICF MODEL APPLIED TO PRE-SCHOOL DISFLUENCY

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### Abstract

Dysfluency is a complex, multifactorial and multidimensional disorder. It is crucial, therefore, to develop a treatment that considers which are the most relevant dimensions for the characterization of a person with dysfluency and its functioning. Applying the *International Classification of Functioning, Disability and Health* - ICF (WHO, 2001) to fluency disorders for either evaluative or rehabilitative purposes has already been proposed (Yaruss and Quesal, 2004). Nevertheless, its use in clinical speech therapy dealing with fluency disorders is still limited. Research aims are to apply the ICF model to clinical cases of dysfluent preschool children; to conduct a descriptive analysis of ICF components and related variables; to investigate the correlation between the identified variables. The results obtained indicate that the ICF is a suitable tool to frame dysfluency and to outline an overall functioning profile of the subject, considering both personal characteristics and environmental components, as well as their mutual interactions.

### Introduction

Dysfluency is a complex, multifactorial and multidimensional disorder, characterized by the interaction between several components: cognitive, affective, linguistic, motor and social (CALMS Model, Healey et al., 2004). It is crucial, therefore, to develop a treatment that considers the most relevant dimensions for the characterization of a person with dysfluency and its functioning. In this case, the model that allows for the integration of the different components determining and modifying stuttering, while taking

into account the person in its entirety, is the *International Classification of Functioning, Disability and Health - ICF* (WHO, 2001). As a matter of fact, the ICF model does not only consider the disease but also the patient's health status, merging four fundamental dimensions that contribute to the functioning of the person: Body Functions and Structures, Activity and Participation, Environmental Factors and Personal Factors (Fig. 1). Applying the ICF model to fluency disorders (Fig. 2) for either evaluative or rehabilitative purposes (Yaruss and Quesal, 2004) has already been proposed. Nevertheless, its use in clinical speech therapy dealing with fluency disorders is still limited.

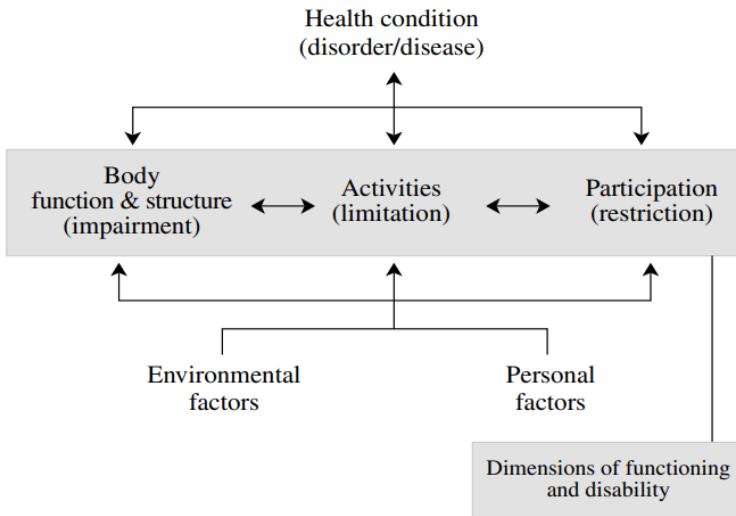


Fig. 1: *International Classification Of Functioning, Disability And Health - Icf* (Who, 2001)

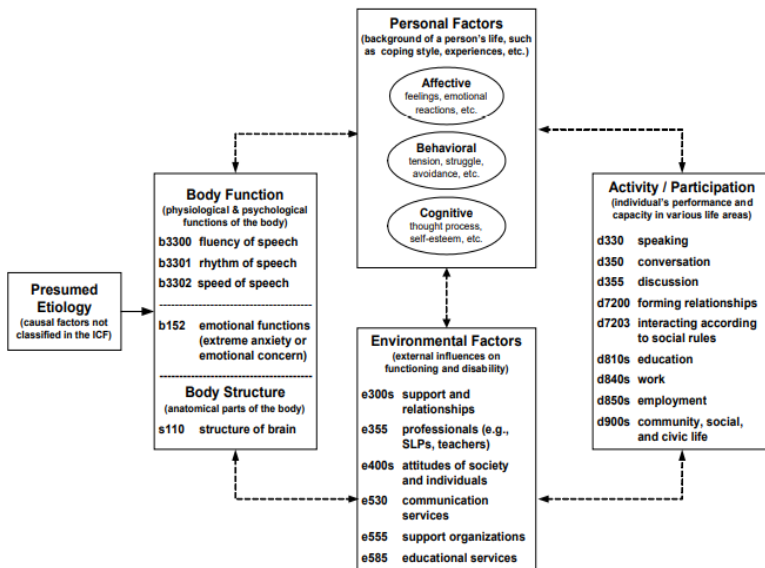


Fig. 2: Application Of The Icf Model To Dysfluency (Yaruss And Quesal, 2004)

Research aims are to apply the ICF model to clinical cases of dysfluent preschool children; to conduct a descriptive analysis of ICF components and related variables, such as dysfluency severity (Body Functions), communicative aptitude (Personal Factors), communicative intelligibility and participation (Activity and Participation), and parental stress (Environmental Factors); to investigate the correlation between the identified variables, comparing the severity of dysfluency respectively with communicative attitude, intelligibility, communicative participation and parental stress, as well as between communicative attitude with communicative participation and parental stress.

## Methods

The sample consists of eight dysfluent preschool children, recruited through convenience sampling at the department of Phoniatrics of ASST

Fatebenefratelli Sacco in Milan. The eligibility criteria are patients aged between 3.0 and 6.0 years old, being Italian native speakers and affected by dysfluency. Exclusion criteria are the presence of neurodevelopmental and psychopathological disorders.

Dysfluency severity was assessed via the *Stuttering Severity Index - SSI-4* protocol (Glyndon D. Riley, 2009); communicative aptitude via the *KiddyCAT questionnaire* (Vanryckghem & Brutten, 2007); intelligibility via the *Intelligibility in Context Scale - ICS* questionnaire (McLeod et al, 2012); communicative participation via the *Focus on the Outcomes of Communication Under Six - FOCUS* questionnaire (Thomas-Stonell N. et al., 2009); and parenting stress via the *Parenting Stress Index - Short Form - PSI-SF* questionnaire (Abidin R.R., 1995).

The assessment of dysfluent children was performed by two female Speech Therapy students. For each participant, two samples of speech were collected and videotaped for each participant (spontaneous speech and speech elicited by figurative tables from the PFLI test by Bortolini, 2004). Video analysis was performed by one student and, after two weeks, repeated in order to investigate intra-rater reliability. At a later stage, parents were administered the ICS, FOCUS, and PSI-SF questionnaires, whereas the KiddyCAT questionnaire was given to children. A database was then compiled and coded, with descriptive analysis of the variables examined, after having checked the trend of the distributions by means of the Shapiro Wilk normality test. Subsequently, the ICF model was compiled for each participant and the individual components and their interaction were described qualitatively (body functions and structures, activity and participation, personal factors and environmental factors). Finally, inferential analysis was carried out by calculating Spearman and Pearson correlation coefficients. To perform the statistical analysis, the following software was used: MecCalc and Jamovi.

## Results

From the descriptive analysis (Table 1) of the SSI-4, it was found that 50% of the children had moderate dysfluency, while 25% had, spec-

tively, mild and severe dysfluency; 62% had a block duration of 0.5-0.9 seconds, and 50% scored between 0 and 4 in the physical concomitants. The analysis of the KiddyCAT questionnaire showed that two children were in the range of 0 ds to +1.5 ds; four children were in the range of 0 ds to -1.5 ds; and two children were below -2 ds. Analysis of the ICS scale showed that all children were below the expected mean ( $M=27.5$ ;  $SD=2.56$ ). The analysis of the FOCUS questionnaire reveals strong variability among scores ( $M=275$ ;  $SD=40.2$ ). The subdomain with the highest mean score is Receptive Language/Attention ( $M=6.04$ ), while the subdomain with the lowest mean score is Speech ( $M=4.34$ ). Analysis of the PSI-SF questionnaire shows that four parents are above the 75th percentile, i.e., in a clinically significant situation; two parents are in the range, above average but not pathological, between the 51st and 75th percentiles; one parent is in the normal range between the 26th and 50th percentiles. In the Difficult Child subdomain, all parents were in the clinical range above the 75th percentile. Statistically significant correlations (Table 2) were found between the total score of the SSI-4 protocol and the «Dysfunctional Parent-Child Interaction» (PCD-I) subscale of the PSI-SF questionnaire ( $p=0.010$ ); between the total score of the KiddyCAT questionnaire with the total score of the PSI-SF questionnaire ( $p=0.001$ ) and its PCD-I subscale ( $p=0.041$ ).

	SSI-4	Frequency SSI-4	Duration SSI-4	Physical Concomitants SSI-4	Kiddy CAT	ICS	FOCUS	PSI-Short Form
<b>Mean</b>	22.8	10.8	1.24	4.50	3.63	27.5	275	91.0
<b>Median</b>	19.5	6.92	0.715	3.50	3.50	27.5	288	91
<b>Standard deviation</b>	8.86	8.89	1.01	3.38	2.39	2.56	40.2	10.5
<b>Minimum</b>	14	3.16	0.580	2.00	1	25	185	74
<b>Maximum</b>	40	25.1	3.40	12.0	8	32	299	104

*Table 1: Descriptive Analysis Of The Variables*

	Pearson's correlation coefficient (r) Spearman's correlation coefficient (p)	p-value
<b>SSI-4 and PCD-I</b>	$\rho = -0.835$	$p = 0.010$
<b>KiddyCAT and PSI-SF</b>	$r = -0.948$	$p = 0.001$
<b>KiddyCAT and PCD-I</b>	$\rho = -0.727$	$p = 0.041$

Table 2: Statistically Significant Correlations Between The Variables

## Discussion

The analysis of the SSI-4 shows that the severity of dysfluency is determined more by the frequency of dysfluent episodes; this is, in fact, the most frequently used parameter to define the severity of the disorder (Bloodstein, 1995). Instead, there are no significantly high scores in the parameters «Duration» and «Physical co-occurrences» and this is a positive prognostic index (Yairi and Ambrose, 2005). Communicative aptitude is overall positive; in fact, it is more common to develop explicit awareness about one's fluency during the transition from preschool to school age (D'Ambrosio, 2017), which results in a negative repercussion on communicative aptitude. From the ICS scale, it emerges that all children rank below the expected mean; therefore, it is likely that disfluency has a significant impact on intelligibility; however, there are no studies confirming this hypothesis. From the FOCUS questionnaire, there is strong variability in communicative participation. In particular, it shows that those subdomains with higher mean scores (Receptive Language/Attention, Social/Play, Independence) are not affected by the presence of dysfluency; whereas those with lower mean scores (Speech, Pragmatics, Intelligibility) are affected by it. The PSI-SF questionnaire shows, overall, a high level of parental stress and difficulty in managing their child. The results are in line with the literature, in which the emotional and psychological impact of disfluency on parents is reported (Langevin et al., 2010). The correlation between the total score of the SSI-4 protocol and the subdomain «Dysfunctional Parent-Child Interaction» ( $r = -0.835$ ;  $p = 0.010$ ) indicates that, likely, as the severity of dysfluency increases, the parent-child interaction is perceived by the adult to be more dysfunctional. This is partially



confirmed by the literature, where it is reported that the effect of dysfluency on the parent-child relationship ranges from positive to negative (Langevin et al., 2010). Significant correlations between the KiddyCAT questionnaire total score with the PSI-SF questionnaire total score ( $r=-0.948$ ;  $p=0.001$ ) and the «Dysfunctional Parent-Child Interaction» subscale ( $p=-0.727$ ;  $p=0.041$ ) indicates that, as negative communicative attitude increases, it is likely for parental stress to increase, and the parent-child interaction is perceived by the adult to be more dysfunctional.

## Conclusions

The results obtained indicate that the ICF is a suitable tool to frame the dysfluency and to outline an overall functioning profile of the subject, considering both personal characteristics and environmental components, as well as their mutual interaction. Such a framework can facilitate an early and goal-oriented treatment, aimed not only at increasing children's skills and their environment, but also at modifying their cognitive, emotional and behavioral reactions to the fluency disorder.

The limitations of this study are the sample's small size, the lack of reliable and validated instruments to assess dysfluency in Italian language, and the analysis of communicative participation only from the parents' perspective. Further studies, therefore, will have to expand the sample to allow for the generalization of results; in addition, it would be appropriate to have reliable and validated protocols for assessing dysfluency in Italian; finally, it would be interesting to consider the questionnaire *Speech Participation and Activity Assessment of Children* (McLeod, 2004) to assess the communicative participation perceived by the child and the completion of the questionnaires ICS and FOCUS also to other salient figures in his daily life.

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**TELEPRACTICE IN SPEECH AND LANGUAGE THERAPY AND IN STUTTERING MANAGEMENT: A STUDY ON THE PERCEPTION AND THE ACCEPTANCE BY THE FLI SPEECH AND LANGUAGE THERAPISTS IN ITALY**

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ABSTRACT

The use of technology to provide speech therapy services is not a recent phenomenon and a considerable number of papers have examined various factors used to understand which ones favor the sustainability of telepractice and which ones represent a challenge. Some authors have suggested that the acceptance of telepractice by healthcare professionals is the key factor to ensure its spread. The objective of this study is to investigate the perception and acceptance of telepractice by speech therapists operating in Italy and to investigate its use on clients with stuttering. To achieve this objective, a survey was sent to the members of the Italian Federation of Speech and Language Therapists (Federazione Logopedisti Italiani, FLI). 33.8% of members took part in the questionnaire. The answers revealed a limited use of telepractice before 2020 alongside a positive perception regarding this modality. 31.2% of participants had never used telepractice and 90.8% of those who adopted it did so at the beginning of the SARS-CoV-2 health emergency. The response regarding the technologies and platforms used and the level of satisfaction of the speech therapists were positive, although some critical issues emerged. It is possible to notice an improvement in the therapists' attitude towards telepractice after the first sessions but there is a perception of less effectiveness of eye contact, non-verbal communication and the expression of emotions during the communicative exchange with clients who stutter.

## Introduction

In 2020 an external factor took over and led some speech therapists to use telepractice: the whole world found itself in a pandemic which forced everyone to respect social distancing and led to limitations in the work environment. At an international level, the use of technology to provide remote speech therapy services is not recent and some researchers have proposed that the acceptance of telepractice by the clinician is the key factor that guarantees its diffusion (Hines et al., 2015; Wade, Elliott & Hiller, 2014).

## Objectives and methods

The aim was to investigate the perception and acceptance of telepractice by speech therapists operating in Italy and to investigate its use on patients with stuttering. An online questionnaire (35 items) was sent via e-mail to the members of the Italian Federation of Speech and Language Therapists (FLI), in July 2020 and September 2020. During the first session, there were 1050 FLI members, and during the second session there were 1052. In total, 356 speech therapists participated in the survey.

## Results and discussion

### *Perception and acceptance of telepractice in general*

Participation in the survey involved about one third of FLI members (33.8%). 68.8% of participants had used or currently use telepractice, compared to 31.2% of respondents who did not. Being in a state of health emergency that poses the need for social distancing since the beginning of 2020, it is considerable that such a large number of participants have never provided speech therapy services through the use of technology. In addition, 90.8% of the subjects who adopted telepractice started to do so at the beginning of the SARS-CoV-2 emergency, demonstrating that this modality was not widespread previously. Many studies on telepractice have been conducted in countries

with a low population density such as Australia or America, where the need to connect people is also a result of the vastness of the territory. The Italian context has different characteristics: this could be one of the reasons for the low diffusion of telepractice before 2020. The majority of participants consider the quality of the therapeutic relationship (65.0%), the quality of the communicative exchange (75.6%), attention (62.9%) and patient collaboration (51.9%) to be lower when compared to the standard session. The concern that these aspects diminish is a factor that slows down the spread of telepractice (Almathami et al., 2020; Overby & Baft-Neff, 2017; Sutherland et al, 2016). The duration of the tele-session is judged to be equal to the traditional session (49.8%) and the speed of preparation of the material to be greater (54.1%). The four characteristics judged most negatively are connected to each other because they all refer to the relationship with the patient. To investigate if there were differences in the prevalence of some response options, the subjects are then asked to define how they felt before using telepractice for the first time and after using it by evaluating the following parameters: certainty of the effectiveness of telepractice, confidence in using it, enthusiasm, confidence of being able to establish a good relationship and perception of being at ease. The question «how did you feel before using the telepractice?» was asked after using it. However, we believe that the answers have their validity due to the fact that most of the participants answered the questionnaire at a time temporally close to their first uses of telepractice and the sensations experienced «before» may still have been vivid, given the impact that having to decide whether to continue to follow their patients through technology has certainly had. Overall, there is a change in trend in the prevalence of the answers given, which are more positive after its use. The statements in the literature indicate that the use of telepractice improves the clinician's attitude and makes the practitioner recognize it as a valid tool (Freckmann, Hines & Lincoln, 2017; Fairweather, Lincoln & Ramsden, 2016).

### *Perception and acceptance of telepractice in the management of stuttering*

Investigating the implementation of telepractice on subjects with stuttering, 63.3% of speech therapists do not take care of subjects with

stuttering. Of the 84 who do, 47 did not follow patients with stuttering using technology (56.0%). The factors that led to this choice can be various, such as the lack of technology or adequate Internet connection, the lack of confidence in telepractice, the lack of training in this modality or the belief that stuttering is not a disorder that can be adapted to the technological context. Examining the results relating to which speech therapy services are adaptable to modern technology, it stands out that, unanimously, all of the subjects believe that telepractice is a way in which it is possible to provide counseling to the patient and caregivers. A wide majority even agrees on the post-treatment follow-up (94.6%). As for the treatment, most of the people surveyed believe it is achievable through technology (89.2%). In the case of the evaluation, however, the professionals' opinions are divided, highlighting the complications and doubts concerning the provision of this service. This result is inconsistent with most studies in the scientific literature, according to which the assessment of stuttering through technologies is feasible with success. The discrepancy between the results of this study and those of previous investigations might be caused by the need to have test tools suitable for the technological environment to evaluate a patient with stuttering and to receive adequate training on how to implement the assessment in a digital context. Participants are then asked to compare the effectiveness of 4 parameters (eye contact, verbal communication, non-verbal communication and expression of emotions) during the tele-session compared to the traditional session. The prevalence of speech therapists judges them to be less effective during telepractice, except verbal communication which is deemed equally effective. The data just presented is in accordance with what was expressed by some participants of the study by Jahromi and Ahmadian (2018), which was conducted by the point of view of the patients, which deemed it difficult to establish eye contact with the therapist, to express their emotions and understand facial expressions through a webcam.

## Conclusions

This study shows a scarce diffusion of telepractice before 2020 among speech therapists affiliated to FLI. However, the professionals have shown

a positive perception regarding this modality and a good level of satisfaction, although some criticalities can be noted. It is possible to notice an improvement in the speech therapists' attitude towards telepractice after using it. When looking at the implementation of this modality on patients with stuttering, there is a perception of less effectiveness of eye contact, non-verbal communication and the expression of emotions.

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**OVERALL ASSESSMENT OF THE SPEAKER'S EXPERIENCE OF STUTTERING (OASES): OUTCOMES OF INTENSIVE STUTTERING TREATMENT IN BULGARIA**

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ABSTRACT

The present paper is an attempt to evaluate the self-perceived quality of life of adults who stutter (AWS) and to assess the impact of stuttering on their lives.

The Overall Assessment of the Speaker's Experience of Stuttering (OASES) instrument based on an adaptation of the World Health Organization's International Classification of Functioning, Disability and Health was applied. OASES quality-of-life outcomes were obtained from 27 AWS before and immediately after the application of two intensive therapies in Bulgaria: (i) Van Riper's non-avoidance IT for AWS and (ii) La Trobe University prolonged-speech program for AWS.

The Van Riper's non-avoidance therapy OASES general group results related with total impact score show that all 15 AWS demonstrate statistically important improvement after intensive therapy (IT).

The La Trobe smooth speech therapy OASES-A general group results related with total impact score show that 10 of 12 AWS manifest statistically important improvement after IT.

A noticeably larger total improvement of the quality of life regarding the common group results for AWS undergoing Van Riper's IT (mean improvement total score = 1.860, SD = 0.58) compared with AWS undergoing La Trobe Therapy (mean improvement total score = 0.448, SD = 0.36) was observed.

Before avoidance IT, the OASES scores indicated a severe impact rating of stuttering on AWS. After IT, impact scores were reduced to a mild-to-moderate rating.



The La Trobe impact scores results moved from a moderate rating prior to IT to a mild-to-moderate rating following treatment. On average, the impact results showed a reduction in two of the four sections evaluated by OASIS.

## **Methods**

The Overall Assessment of the Speaker's Experience of Stuttering (OASES) instrument is based on an adaptation of the World Health Organization's International Classification of Functioning, Disability and Health (Yaruss & Quesal, 2004). This assessment tool was applied prior to and following intensive therapy (IT) using the Van Riper stuttering modification and La Trobe University prolonged speech treatment approaches.

Van Riper's (1973) stuttering-modification therapy, which constitutes a non-avoidance IT for AWS, was applied in 2010 at the South-West University Stuttering Research Center. The format of therapy was intensive and spaced for individual and group.

The La Trobe University prolonged-speech program (Block & Dacakis, 2003; Program manual, 2015) was applied in 2015. An adapted Bulgarian model of the La Trobe intensive program was designed to be a student-delivered treatment for adults by Block (2012).

This paper summarizes OASES data from 27 AWS obtained before and immediately after receiving the two intensive stuttering therapies (Georgieva, 2015; Georgieva and Stoilova, 2018).

### *Participants*

Fifteen AWS (14 males and 1 female with an average age of 25.2 years) were involved in the therapy process designed by Fibiger and Georgieva delivered in a 5-day program (Georgieva & Fibiger, 2010). Three clinicians and 6 Master degree students in the Logopedics program were part of the delivery team.

Twelve AWS (10 males and 2 females with an age range of 18-29 years: mean of 22.5 years) were part of the therapy process. The therapy delivery team consisted of Master degree students in Logopedics and 4 clinicians. The fluency shaping approach was referred to as Smooth Speech (for details,

see Block and Dacakis, 2003). Each client had 2 student clinicians, who administered the 8-week program. The OASES quality of life instrument was applied after the first week of the IT.

## Results

Sections	Elements of sections	Mean impact-group scores (SD) before the Therapy 1	Mean impact-group scores (SD) after the Therapy 1	Mean impact-group scores (SD) before the Therapy 2	Mean impact-group scores (SD) after the Therapy 2
Section 1	General information	3.82 (0.52)	1.98 (0.40)	2.74 (0.47)	2.2 (0.66)
Section 2	Reactions to stuttering	3.88 (0.38)	1.90 (0.47)	3.05 (0.87)	2.41 (0.66)
Section 3	Everyday communication	3.57 (0.73)	1.71 (0.39)	2.24 (0.66)	2.02 (0.69)
Section 4	Quality of life	3.42 (1.04)	1.71 (0.36)	2.08 (0.56)	1.69 (0.43)
Total:	Totally	3.68 (0.66)	1.82 (0.40)	2.53 (0.57)	2.08 (0.56)

Table 1: Total generalized OASES-A impact group results before and after administration of the intensive therapies (Therapy 1: Van Riper's non-avoidance method and Therapy 2: The La Trobe prolonged speech program)

Sections	Elements of OASES sections	Wilcoxon values after the Therapy 1	Wilcoxon values after the Therapy 2
Section 1	General information	Z = - 3.409; p = 0.001	Z = - 3.065; p = 0.002
Section 2	Reactions to stuttering	Z = - 3.409; p = 0.001	Z = - 2.833; p = 0.005
Section 3	Everyday communication	Z = - 3.408; p = 0.001	Z = - 1.179; p = 0.238
Section 4	Quality of life	Z = - 3.451; p = 0.001	Z = - 2.672; p = 0.008
Total:	Totally	Z = - 3.408; p = 0.001	Z = - 2.830; p = 0.005

Table 2: Wilcoxon statistics group results related with the total OASES impact score after the intensive therapies (Therapy 1: Van Riper's non-avoidance method and Therapy 2: The La Trobe prolonged speech program)

All 15 AWS demonstrate statistically important improvement after the Van Riper's non-avoidance IT (one exception – 14 AWS manifest improvement regarding the quality of life section).

Ten of the 12 AWS manifest statistically significant improvement after La Trobe IT (regarding the OASES-A general result as well as section 2 and 4). All 12 AWS demonstrated statistically positive improvement related with OASES-A sections 1 and 3 (general information and everyday communication).

## Conclusions

The OASES impact scores obtained before avoidance IT indicate a severe impact rating of stuttering. After IT, the impact rating was reduced to mild-to-moderate. The AWS viewed themselves as able to speak fluently and to communicate in an easier way in different communicative situations. We observed some difficulties in specific speech situations. That is, some of the AWS continue to exhibit physical tension during the moments of stuttering, but not enough to interfere with communication in most situations. Very rarely did some of the AWS continue to avoid some speaking situations with authorities due to their stuttering. In attempts to reduce stuttering, some of the AWS occasionally change some «difficult» words.

The La Trobe IT impact rating's results moved from moderate before IT to mild-to-moderate following therapy. The average impact results for AWS was reduced in sections 1 and 3 of the OASES. Seventy-five percent of AWS confirmed that their quality of life underwent a positive change after prolonged speech IT (including their satisfaction with communication in different speech situations). The majority of them demonstrated positive changes regarding communication with friends and persons outside the family milieu. For the majority of AWS, stuttering did not negatively influence their self-confidence. For some, the fluency disorder represented a «small» obstacle to meeting the needs of their profession or to be successfully employed.

It may be concluded that, in the majority of the AWS who were influenced positively by the two intensive therapies, the OASES rating

was able to reflect the reduction of impact. The authors thus strongly recommend the application of OASES-A as a high-quality, effective and easier comprehensive assessment instrument that provides good evidence on the stuttering impact on the speaker's perceptions after non-avoidance and fluency-shaping IT.

Taking into account the sufficient time required for an easy administration of the OASES-A test, the authors find it a useful evidence-based instrument for the measurement of AWS's quality of life for Bulgarian clinical application.

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## **CAN MINDFULNESS ADD A SIGNIFICANT CONTRIBUTION TO STUTTERING TREATMENT PROGRAMMES?**

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### ABSTRACT

Nowadays the scientific community stresses the need for a multidisciplinary treatment of stuttering that focuses not only on disfluency, but also on the lifelong emotional and psychological impact of this disorder. A comprehensive plan of intervention should include multiple objectives selected on the basis of specific needs which can be obtained via an overall assessment, including the individual's reaction to his/her disorder. To this regard, the recent Dutch «Clinical Guidelines to Stuttering in Children, Adolescents and Adults» recommends Cognitive Behavioural Therapy as a useful approach in addressing the psychosocial aspects associated with stuttering (Pertjjs et al., 2014).

Over the last few decades, Mindfulness has catalysed the interest of many psychologists and neuroscientists. It is currently at the centre of a number of programmes and techniques, along with many «third wave» cognitive and behavioural therapies, such as Acceptance and Commitment Therapy. Numerous studies argue that Mindfulness techniques could not only exert beneficial effects on mental and physical health, but also at cognitive and emotional levels, both in adults and children. Moreover, although there is as yet little knowledge relating to the underlying mechanisms, necessitating further studies, to date there is growing evidence that Mindfulness could bring about structural and functional changes within the brain.

Some authors have recently elaborated interesting considerations regarding possible points of contact between Mindfulness and certain critical issues that are typical in stuttering. They claim that two of its fundamental mechanisms, i.e. the self-regulation of attention on the immediate present and the strategy of acceptance, could generate a promising variety of beneficial effects on stutterers. In particular, from the analysis of currently

available literature, it seems that the practice of Mindfulness may encourage a favourable precondition for therapy, and simultaneously enhance the individual's capacity to cope. In everyday life, it could also be advantageous in putting into general practice the various techniques acquired in therapy sessions, thus reducing to a minimum the risk of a relapse.

In addition to the acquisition of fluency supporting techniques, some authors maintain that acceptance can also be an important therapeutic goal, capable of helping people who stutter develop a more positive attitude towards communication. This would consequently have positive effects on their mental health and quality of life. Furthermore, training stutters to concentrate all their attention on the immediate present, as taught by Mindfulness, would both diminish the tendency to worry and brood, and the possibility of past memories and emotions perpetuating the cycle of automatic and maladaptive behavioural responses, commonly found in those who stutter. Although some initial positive signs have been identified regarding the possibility that Mindfulness interventions may constitute a new, potentially significant contribution towards the management of cognitive, emotional and behavioural aspects associated with stuttering, research in this area is still limited. Further in-depth studies of the question are necessary, in order to better specify the usefulness and effectiveness of incorporating Mindfulness into the treatment of stuttering.

Over the last few decades, interest in Mindfulness has increased exponentially. Currently it is included in numerous meditation programmes and techniques and it has also become one of the central aspects of the «third wave» Cognitive and Behavioural approaches, such as the Acceptance and Commitment Therapy (ACT) and Mindfulness-Based Cognitive Therapy (MBCT), that focus on the relationship to emotions and thoughts. Mindfulness is a psychological function aimed at reaching a mental state of awareness, non-judgmental acceptance and conscious attention to current thoughts and emotions. In recent years, studies reporting the benefits of Mindfulness on mental and physical health are multiplying. To date, one of the strongest pieces of literary evidence seems to concern the effectiveness of MBCT against depression, in fact in some countries, like Canada, it is included within the clinical guidelines as a recommended option for the prevention of depressive relapses.

The purpose of this study was to investigate the potential of Mindfulness within stuttering treatment programmes, through a search on the scientific literature available in the Pubmed database filtered by 2010 and mid-2021. Mindfulness key components are twofold: the self-regulation of attention to the present moment, and the ability to consider the present experience with awareness and acceptance. In relation to stuttering, Yaruss and colleagues (2012) believe that acceptance can be a fundamental element of a therapy programme, along with the acquisition of fluency support techniques. Helping people who stutter to be open and accept their stuttering could be beneficial for several reasons. This attitude may contribute to reducing the negative impact of stuttering and the severity of dysfluency (Yaruss et al., 2012), and it may also favour emotion regulation (Harley, 2018). In this way, the person learns not to react to their emotions in a maladaptive or automatic way, but in a more appropriate and conscious manner, avoiding negative coping strategies such as effort and avoidance behaviours (Boyle, 2011; Harley, 2018). As a result, communication skills would improve and a general positive predisposition towards communication would develop as well (Harley, 2018). Moreover, acceptance may even promote generalization and reduce the probability of relapse (Yaruss et al., 2012), since it would also favour the use of strategies learned in therapy (Harley, 2018).

Another important Mindfulness-training keystone is represented by the concentration on thoughts and feelings that arise in the here and now. By containing wandering attention and focusing on the present, Mindfulness may favour the reduction of the tendency to worry and ruminate experienced by some stutterers (Harley, 2018), as it decreases the possibility that negative memories and anticipations of feared future events may contaminate the current moment. To date, some empirical studies have been carried out to investigate the potential of Mindfulness principles with stutterers. Beilby and colleagues (2012) investigated the effectiveness of an integrated Acceptance and Commitment Therapy (ACT) programme adapted for stuttering treatment. Twenty adults who stuttered participated in 2-hour group therapy sessions conducted weekly for eight consecutive weeks. Each week, participants were trained on both the ACT core components and the speech fluency strategies that were individually tailored to the specific

fluency needs. Results showed significant reductions in the adverse impact of stuttering on participants' lives, an increase in their readiness for change, an improvement in their Mindfulness skills and a reduction in the overall frequency of stuttering. According to the authors, these positive findings would suggest that the ACT delivered in a group format may be a promising intervention for adults who stutter. Instead of an integrated programme, Freud and colleagues (2019) developed a combined intervention divided into three consecutive parts for eight adults who stuttered. The first part consisted of eight group sessions of ACT principles. Stuttering modification therapy strategies (SMT) were provided consecutively in eight sessions of both individual/pair and group therapy, followed by eight monthly stabilization sessions.

According to this research, participants benefited from a number of improvements. In comparison to the pre-treatment condition, it seemed that speech situations were ultimately perceived as less threatening; participants appeared to exhibit gradual, more positive emotional reactions and attitudes towards stuttering, and they reported improvements in both daily communication situations and general quality of life. More recently, Sønsterud and colleagues (2020) investigated an individualized therapy approach entitled Multidimensional Individualized Stuttering Therapy (MIST) that combined components of stuttering and speech modification interventions with ACT core values. Following a ten-hour therapy over four sessions involving eighteen adults, these scholars detected a significant decrease of the impact of stuttering at 6- months and 12-months post-therapy, and a strong association between participants' overall satisfaction with MIST and improved speaking abilities.

Lately, Feldman and colleagues (2021) have conducted a randomized controlled clinical trial on 56 adults who stuttered. Participants were involved in an Inquiry-Based Stress Reduction programme intervention, which is a Mindfulness and cognitive-reframing method consisting of twelve weekly group sessions. In comparison to the control group, participants showed improvements in their overall stuttering experience, as well as benefits in trait anxiety levels and in satisfaction with life.

In conclusion, based on this research, it seems there is emerging evidence regarding the possibility that ACT may positively contribute towards



the management of psychosocial aspects associated with stuttering. Nevertheless, further and broader research in addition to randomized controlled trials are needed to replicate these findings and to deepen the knowledge of the mechanisms underlying the different Mindfulness interventions, in order to determine their clinical potential in stuttering treatment programmes.

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## COMMUNICATION ATTITUDE IN PRESCHOOL CHILDREN WHO STUTTER

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### ABSTRACT

Children who stutter (CWS) have more negative attitudes towards communication than their typically fluent peers (Clark et al., 2012) and peers with other communication and language disorders (De Nil & Bruten, 1990). Due to this relation between stuttering and communication attitude, studies confirmed the existence of a positive correlation and co-influence between stuttering severity and communication attitude (Vanryckeghem et al., 1996; Vanryckeghem et al., 2001). However, this correlation has never been deeply explored in a preschool-aged cohort, which could help clinicians to deliver early interventions to prevent dysfluency to become chronic.

Even the environment itself can influence the stuttering progression (Langevin et al., 2010). Previous studies have demonstrated that the child's stuttering can cause parents negative emotions like stress and disappointment, which can amplify the stammering even more. However, up to now, no Italian study has investigated the relation between stuttering severity and communication attitude. A clearer understanding of this correlation could help clinicians give parents the right strategies to prevent dysfluency from becoming chronic.

The present study aims to investigate in a preschool-aged cohort who stutter:

- the relation between stuttering severity and communication attitude;
- the relation between parents' stress and stuttering severity and communication attitude respectively;
- the relation between communication participation and stuttering severity and between communication participation and communication attitude.

10 CWS aged between 3.0 and 5.11 ( $M=4.8$ ;  $ds= 0.6$ ) have been included in the present study. Parents completed FOCUS and PSI-SF questionnaires to analyse the child's communication participation and the

parents' stress respectively. Speech and Language Therapists (SLT) performed SSI-4, KiddyCAT and FOCUS to assess the stuttering severity, the communication attitude and the communicative participation, respectively. 10 Children Who do Not Stutter (CWNS) have also been recruited to compare KiddyCAT and PSI-SF scores between CWS and CWNS.

KiddyCAT scores showed that ~20% of CWS have scored 1 in questions related to cognitive and affective aspects, while ~70% of them scored 1 in questions related to motor aspects. The communication attitude was found to correlate with the physical concomitants at SSI-4 ( $\rho=0.733$ ;  $p=0.0158$ ), but not with the stuttering severity, as expected. The PSI-SF subtest 'Parent-Child Dysfunctional Interaction' was found to significantly discriminate CWS from CWNS ( $p=0.0353$ ). No significant correlations were found between FOCUS and SSI-4, except for the subtest intelligibility (when FOCUS was completed by parents) ( $p=0.0091$ ).

CWS were not inhibited by the communication partner, because CWS are less exposed to derision compared to adolescents and adults who stutter. Data did not highlight any correlation between communication attitude and stuttering severity, maybe due to the limited cohort. However, a significant correlation emerged between physical concomitants and communication attitude: as they are coping strategies that the person employs to avoid the primary symptoms, they contribute greatly to determine the child's stuttering awareness. The present studies showed also that the presence of stuttering affects the child-parent interaction, which can therefore cause negative emotions like stress and guiltiness. Indeed, a higher stuttering severity reduced the CWS's intelligibility.

## Framework

Negative experiences and failures during the communication act can cause people who stutter to avoid behaviours related to the communication itself. These negative emotions affect people's communication attitude, as it is often perceived as negative. It has been demonstrated that children who stutter (CWS) have more negative attitudes towards communication than their typically fluent peers (Clark et al. 2012) and peers with other communication and language

disorders (De Nil & Brutton, 1990). The correlation between communication attitude and dysfluency has been explored in other studies (Vanryckeghem et al., 1996; Vanryckeghem et al., 2001), which suggested that negative communication attitude is not just a consequence, but it also plays a key role in the dysfluency prognosis, therefore establishing a positive correlation and a co-influence between stuttering severity and communication attitude. Due to the dysfluency complexity and multidimensions, Haeley et al have developed the CALMS model that can help the clinician consider the motor aspect of the dysfluency, as well as the cognitive, affective, linguistic, and social aspect when assessing people who stutter, as factors that actively contribute to disfluency development (Fig. 1). However, the relationship between stutter and communication attitude has never been deeply explored in preschool children who stutter (CWS), as 80% of this cohort experiences a positive and spontaneous recovery before going to school. A correct understanding of this correlation could help clinicians deliver early interventions to prevent dysfluency to become chronic.

Even the environment plays a key role in determining the development of dysfluency. It has been demonstrated that parents change their linguistic- communicative mode (Ratner, 1992) and experience emotions, such as stress, disappointment, guiltiness and frustration (Langevin, 2010). These negative emotions can influence the dysfluency prognosis, as they can amplify this disorder even more. However, up to now, no Italian studies have confirmed the existence of negative emotions in parents of children who stutter. Furthermore, the correlation between environment and communication attitude has never been deeply explored. The present study, therefore, aims to discover in depth this correlation, which could help clinicians to give parents strategies and support to prevent the dysfluency to become chronic.

## Objectives

The present study aims to investigate in a preschool-aged cohort who stutter:

- the relation between stuttering severity and communication attitude;
- the relation between parents' stress and stuttering severity and communication attitude respectively;

- the relation between communication participation and stuttering severity and between communication participation and communication attitude.

## Methods

### *Cohort*

10 CWS aged between 3.0 and 5.11 years old (average: 4.8; sd: 0,6), of which 8 males and 2 females, have been recruited from the waiting list of the following practices: AAST Fatebenefratelli Milano (MI), and private practices «ParLAMI» (MI) and «Puzzle» (MI). The inclusion criteria are as follows: age between 3.0 and 5.11 years old; diagnosis of dysfluency assessed with the Stuttering Severity Instrument 4 (SSI 4). The exclusion criteria are as follows: presence of comorbidity. To ensure the KiddyCAT and PSI-SF validity, 10 children who do not stutter (CWNS) have also been recruited.

### *Assessment instruments*

An anamnestic questionnaire has been set up *ad hoc* to identify any risk factors and the child motor and linguistic development. The assessment instruments used to analyse the severity of dysfluency, communication attitude, communication participation and parent stress have been reported in Tab 1.

### *Procedures*

The present study took place from March to September 2019. The anamnestic questionnaire was completed by the Speech and Language Therapist (SLT) in collaboration with the parents; FOCUS and PSI-SF were then given to the parents. Two speech productions (i.e., describing pictures and pretend play) have been gathered and video-recorded by the SLT to assess the severity of dysfluency with the SSI-4. KiddyCAT was then performed to

assess the child's communication attitude and SLT completed the FOCUS. SSI-4 and FOCUS have been filled up again after two weeks by the *same rater* and by a *different rater* to ensure *intra* and *inter* reliability respectively. However, as not all the data have been gathered, the reliability of both SSI-4 and FOCUS has been ensured just for 5 children. SLT performed the KiddyCAT to CWNS and gave the control's parent the PSI-SF to ensure the validity of both questionnaires. The SLTs proceeded by analysing the data gathered from the descriptive analysis and statistical correlation of the following variables: SSI 4, KiddyCAT, PSI-SF and FOCUS. The Spearman and Pearson linear coefficients have been calculated via Medcalc to analyse the correlations, with a confidence interval of 95% (CI) and with  $\alpha = 0,05$ .

## Results

The most relevant results are as follows. KiddyCAT scores showed that ~20% of CWS have scored 1 in questions related to cognitive and affective aspects, while ~70% of them scored 1 in questions related to motor aspects (Fig 2). The communication attitude was found to correlate with the physical concomitants at SSI-4 ( $\rho=0.733$ ;  $p=0.0158$ ), but not with the stuttering severity (Tab 2). The severity of dysfluency correlated significantly with the child intelligibility, when FOCUS was completed by the parents ( $r = -0,7708$ ;  $P = 0,0091$ ) (Tab. 3), however it has not been found to correlate with the PSI-SF or the communication participation, when FOCUS was completed by the SLT. The PSI-SF subtest 'Parent-Child Dysfunctional Interaction' was found to significantly discriminate CWS from CWNS ( $P=0.0353$ ) (Tab. 4). Furthermore, KiddyCAT was found to significantly discriminate CWS from CWNS ( $P= 0,0002$ ) and SSI-4 was found to be consistent when re-assessed by the same and different *rater*.

## Conclusions

CWS were aware of their dysfluency, however they were not restrained by the communication partner, because they are less exposed to derision, and

dysfunctional thoughts are not yet consolidated compared to adolescents and adults who stutter. In fact, previous studies showed that the communication attitude gets worse with increasing age (Kawai et al, 2012). Data did not highlight any correlation between communication attitude and stuttering severity, maybe due to the limited cohort. However, a significant correlation emerged between physical concomitants and communication attitude: as they are coping strategies that the person employs to avoid the primary symptoms, they contribute greatly to determine the child’s stuttering awareness. The present studies confirmed Langevin’s study that the presence of stuttering affects the child-parent interaction, which can cause, therefore, negative emotions like stress and guiltiness. Indeed, a higher stuttering severity reduced the CWS’s intelligibility.

## Legends And Tables

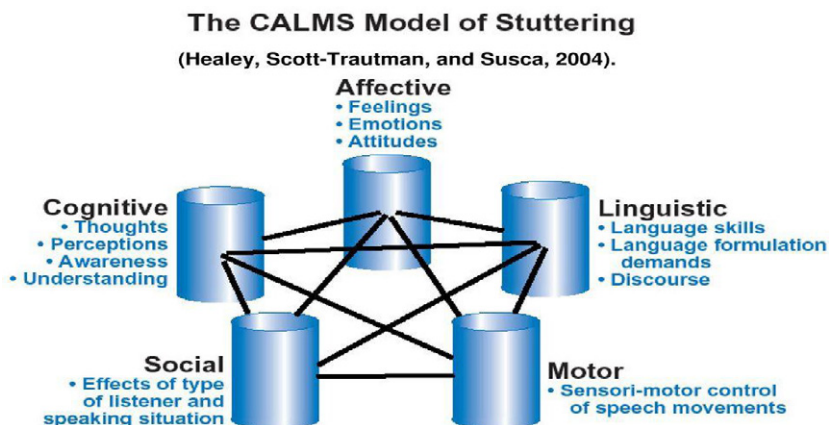


figure 1: the calms model of stuttering

Area to assess	Assessment instrument used
<b>Dysfluency</b>	Stuttering Severity Instrument – 4 (SSI-4; Riley G.D., 2009)
<b>Communication attitude</b>	Communication Attitude Test for Preschool and Kindergarten Children Who Stutter (KiddyCAT; Vanryckeghem & Brutten, 2007)
<b>Communication participation</b>	Focus on the Outcomes of Communication Un der Six, (FOCUS; Thomas-Stonell et al., 2009)
<b>Parent stress</b>	Parenting Stress Index - short form (PSI-SF; Abidin R.R., 1995)

TAB 1: ASSESSMENT INSTRUMENTS USED IN THE PRESENT STUDY

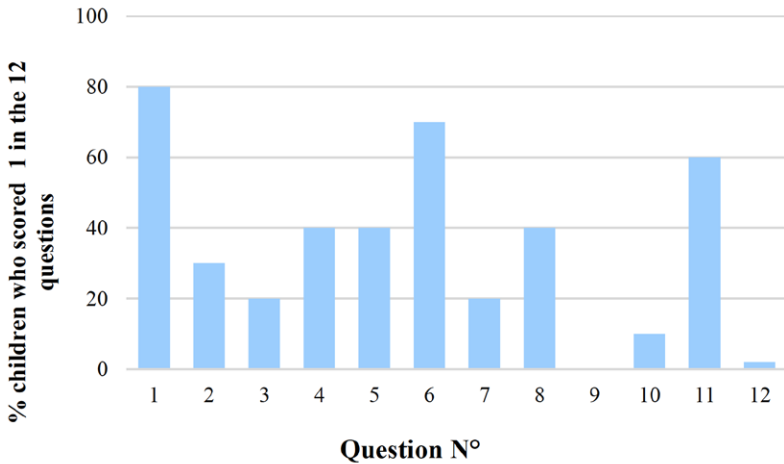


Figure 2: Percentage of children who scored 1 in the 12 questions of the KiddyCAT (N=10)



	<b>Coeff. di Pearson (r)</b> <b>Coeff. di Spearman (p)</b>	<b>P value</b>	<b>IC</b>
<b>KiddyCAT - SSI 4 tot</b>	r = 0,35	P = 0,3215	-0,3587 to 0,8027
<b>KiddyCAT - SSI 4 frequency</b>	r = -0,0045	P = 0,9901	-0,6324 to 0,6269
<b>KiddyCAT - SSI 4 duration</b>	r = 0,1925	P = 0,5942	-0,4974 to 0,7333
<b>KiddyCAT - SSI 4 physical conc.</b>	p = 0,733	P = 0,0158	0,193 to 0,932

Tab 2: Correlation between KiddyCAT total score and SSI-4 total score and its subtests (N=10)

	<b>Coeff. di Pearson (r)</b> <b>Coeff. di Spearman (p)</b>	<b>P value</b>	<b>ICC</b>
<b>FOCUS tot - SSI 4</b>	r = -0,4214	P = 0,2252	-0,8306 to 0,2835
<b>FOCUS speech - SSI 4</b>	r = -0,4038	P = 0,2472	-0,8239 to 0,3029
<b>FOCUS lang.exp - SSI 4</b>	r = -0,1545	P = 0,6700	-0,7146 to 0,5263
<b>FOCUS lang. Rec - SSI 4</b>	r = 0,01799	P = 0,9607	-0,6187 to 0,6404
<b>FOCUS prag - SSI 4</b>	r = 0,5629	P = 0,0903	-0,1034 to 0,8805
<b>FOCUS play - SSI 4</b>	r = -0,3192	P = 0,3687	-0,7900 to 0,3885
<b>FOCUS indep. - SSI 4</b>	r = -0,5800	P = 0,0788	-0,8861 to 0,07818
<b>FOCUS coping - SSI 4</b>	r = -0,3835	P = 0,2739	-0,8161 to 0,3245
<b>FOCUS lang. Ex (perf) - SSI 4</b>	r = -0,5080	P = 0,1339	-0,8619 to 0,1789
<b>FOCUS intel. - SSI 4</b>	r = -0,7708	P = 0,0091	-0,9429 to -0,2743

Tab 3: Correlation between SSI 4 total score and FOCUS total score and its subtests (N=10)

	<b>Difference</b>	<b>P value</b>	<b>IC</b>
<b>PSI tot</b>	-6,1750	P = 0,1766	-15,4355 to 3,0855
<b>PSI-PD*</b>	0,0000	P = 0,9289	-5,0000 to 10,0000
<b>PSI-CDI*</b>	2,5000	P = 0,0353	0,0000 to 6,0000
<b>PSI-DC</b>	1,5500	P = 0,6741	-6,1209 to 9,2209

Tab 4: Validity Of The PSI-SF Between CWS And CWNS (N=10)

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## **MODIFYING UNCONSCIOUS EYE MOVEMENTS TO ENHANCE FLUENCY: A CASE SERIES**

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### ABSTRACT

This is a prospective case series, delivered online, investigating the use of conscious eye movement to enhance fluency in adults with a persistent developmental stammer (DS). This case series aims to identify; if this intervention is both feasible/effective, to record any adverse effects experienced and to develop an intervention protocol for use at pilot clinical trial (NCT04310436).

Methods: On receipt of ethical approval, the five participants were recruited consecutively. Each participant was asked to attend a weekly Zoom meeting for the five-week intervention period. They also agreed to practice a specific eye movement for 20 mins per day during that time.

Satisfaction with Intervention assessed via questions 14, 15 and 16 from OASES-A and satisfaction rating assessment, scale 1-5 with 1 = very satisfied and 5 = very dissatisfied. Compliance with Intervention Protocol

Individual experience OASES-A, Self-Report Stammering Severity (SRSS), Premonitory awareness in stammering (PAiS), % of Stammered Syllables (as defined within SSI-4), Stammering Severity (SSI-4).

Assessments were taken at baseline, post intervention and at three-month follow-up. All participants completed an SRSS, OASES-A and PAiS assessments at each assessment period and four rated their satisfaction. Stammering severity was assessed online by an Independent Psychologist using SSI-4 for case studies 1 & 2.

All five participants completed the programme. No adverse effects were reported. The intervention protocol was derived and modified based

on feedback from Case studies 1, 2 and 3. Secondary Outcome Measures improved for everyone.

This online intervention proved feasible, and no adverse effects were experienced. Results justify the design of an upcoming pilot randomised feasibility clinical trial.

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## Framework

Eye movement and tongue movement appear linked (McDonagh & Monaghan, 2019). The palatoglossus muscle controls the point of entry of the tongue into the oral cavity and is the only tongue muscle that is innervated by the Vagus nerve. The palatoglossus is connected to both the tongue and the palatal aponeurosis (Granick & Jacob, 2010).

Emotions trigger physical movement and gaze response (Conty et al., 2012) approx. 200ms after any stimulus. Conscious inhibition of responses retains some of the original motor plan when gesture is inhibited but not when eye movement is controlled (Godlove et al., 2011). This inhibited motor plan, uninhibited ocular motor plan(eyes) and conscious control of tongue in the Oral Cavity(Speech) - may reflect the competition which occurs in the Right Frontal Aslant Tract (Dick et al., 2019) during stuttering-like moments. If tongue movement has been inhibited via a residual motor plan, creating new movement should enable the switch to a speech motor plan.

## Objectives

Using eye movement to change tongue position is a new approach to managing DS and therefore requires a feasibility study(Chan & Bhandari, 2011) This case series seeks to lay the foundation for a more rigorous investigation into the effectiveness of this intervention by exploring:

- whether the intervention is tolerated;

- to ensure there were no negative side effects;
- to assist in developing a protocol for use in a Randomised Controlled Trial to assess its effectiveness as a tool to manage DS.

This online intervention requires participants with a confirmed DS to move their eyes – and therefore their tongue to regulate stammering like movements

## **Methods**

Ethical Approval: Institute of Technology in Sligo and Sligo University Hospital (REC 800)

### *Assessment Tools*

SSI-4 – Stuttering Severity Instrument (Riley, 2009)

SRSS : Self Report Stuttering Severity Assessment (O’Brian et al., 2020)

OASES-A: Overall Assessment of Speakers Experience of Stammering (Yaruss & Quesal, 2006)

PAiS : Premonitory Awareness in Stuttering (Cholin et al., 2016)

### *Inclusion Criteria*

At least 18 years of age; confirmed DS (historical treatment); proficient in the English language; no diagnosis of any emotional, behavioural, learning, or neurological disorder; cognitive ability to take part, willingness to commit to practice the technique to schedule for the intervention period.

### *Recruitment:*

The five participants were recruited consecutively: 1<sup>st</sup> and 3<sup>rd</sup> through the Institute of Technology, Sligo, 3<sup>rd</sup> via the Irish Stammering Association website and 2<sup>nd</sup> and 5<sup>th</sup> via local and national media.

Case Study	Gender	Age (Years)	Family History of Stuttering/Stammering	Symptoms
1	Male	21	No	Blocks
2	Male	63	Yes	Concomitant hand Movement
3	Male	29	No	Typically, vowels English second language
4	Male	66	No	S, W, R, M, N, Z
5	Male	46	Yes	Blocks and Breathing

Table 1: Case History details of participants

Note: All participants right-handed

### Assessments

The first two participants were assessed, using SSI-4 via Zoom, by the same independent Psychologist. SSI-4 assessments were taken on two consecutive days at each assessment period and the average of these scores was used. OASES-A and PAiS were completed by return mail. Case studies 3 to 5 completed an online assessment via Qualtrics of SRSS, OASES-A and PAIS.

The intervention was delivered on-line via weekly Zoom meetings. The protocol was modified regarding practice, delivery, and technique via an iterative process until Case Study 4. Case studies 4 and 5 followed the intervention protocol detailed below.

Week 1	Week 2	Week 3	Week 4	Week 5	End of week 5
<ul style="list-style-type: none"> <li>• Without moving your head, dip your eyes in the direction of you naval and notice the back of your tongue move up</li> <li>• Practice this movement repeatedly for 10 mins in morning and evening</li> <li>• Pay attention to tongue as move eyes</li> <li>• Receive daily reminder texts</li> </ul>	<ul style="list-style-type: none"> <li>• Continue practice as week 1</li> <li>• During 10 minute practice times pay attention to eye/tongue link as dip eyes down</li> <li>• Do not move your head</li> <li>• Ensure to include in different positions (standing, sitting, reaching)</li> </ul>	<ul style="list-style-type: none"> <li>• Speed up so movement is fast as a blink</li> <li>• Coordinate with your breath – breathe out when you dip your eyes</li> <li>• Outside of practice time be aware of tongue position when you experience stammering like moments</li> </ul>	<ul style="list-style-type: none"> <li>• Practice technique with speech</li> <li>• Pick words or sounds you experience difficulty with</li> <li>• Do not try to use the technique outside of practice time</li> <li>• Objective at this stage is to practice the movement at start of speech gestures</li> </ul>	<ul style="list-style-type: none"> <li>• Continue practice</li> <li>• Coordinate with start of phrases</li> <li>• Can use outside practice time if they chose</li> <li>• Do not feel they have to use technique – they have a choice</li> <li>• Be aware of where tongue is when stammering anticipated</li> </ul>	<ul style="list-style-type: none"> <li>• Use as/if they wish for the next three months</li> <li>• Schedule Assessment</li> <li>• Confirm additional assessment in three months time</li> </ul>

Table 2: Final Protocol Participants 4 & 5

Zoom meetings were 10 to 15 minutes long. Each participant averaged 90min contact time in total. Participants 3, 4 and 5 each received daily practice reminder texts.

### *Results*

The intervention was tolerated by all participants: All cases except No 2 ('too busy') attended all Zoom training sessions and complied with the

practice schedule. They were assessed on their ability to use the technique, their overall feeling about the technique, feeling about the programme and four of the 5 rated their satisfaction: all on a scale of 1-5 with 1 very positive and 5 = very negative. From a total of 38 assessments the mode rating was 2 (25 times) 6 were more positive and the 7 ratings were higher than 2 but not worse than baseline.

Case Studies 1 & 2 were assessed with SSI-4. Case study 1 achieved 51% reduction in %SS when reading but not in speaking tasks. Both participants reduced concomitant behaviours and the duration of longest dysfluency became shorter, post-intervention. The SSI-4 score for Case Study 1 did not change post intervention although their score moved to a lower percentile.

Stammering Severity was reduced in the four participants who continued to use the technique with participants 4 and 5 achieving reductions of 54% and 63% in Self Rated Stammering Severity at follow-up. For participants 1,3 4 & 5, the negative impact of being an adult with DS was reduced and all 5 recorded fewer premonitory sensations

## Discussion

All five participants tolerated the intervention and there were no negative consequences. Case studies 4 and 5 achieved Minimum Clinically Important Difference MCID of 50% (Reddy, Sharma and Shivashankar, 2010) All participants reported Minimal Detectable Change of 1% (MDC) (Jones et al., 2005). The observed benefits need to be assessed against a control and justify the use of the final protocol at a pilot clinical trial NCT04310436.

## Conclusions

This online intervention proved feasible, and no adverse effects were experienced. Results justify the design of an upcoming pilot randomised feasibility clinical trial.



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## **FAMILY DYNAMICS IN DEVELOPMENTAL DISORDERS: A COMPARATIVE STUDY**

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### ABSTRACT

The present study investigated family dynamics in families in which neurodevelopmental disorders are present, with the aim of detecting alterations in parental stress perception and childhood externalizing behaviour in children post-pandemic. Perceived stress levels in family management, educational style and parents co-parenting on the one hand were noted; on the other, childhood externalizing behaviour that affects functioning of children with neurodevelopmental disorders. Results were compared between four different clinical groups analyzed: hearing loss, language and specific learning disorders, stuttering and autism.

### Framework

Evidence found that parents of children with autism spectrum disorder have a higher parental stress perception and childhood externalizing behaviour perception compared to children with other parents clinical profiles (Di Renzo, Bianchi di Castelbianco et al., 2020; Hayes and Watson, 2013; Lecavalier, Leone, Wiltz, 2006). During the period of the pandemic from March 2020 to date, the reports made by families to the CRC in Rome for children's difficulties have increased significantly.

It is therefore of considerable interest to investigate whether, following this period, the distribution of the parents' perceived low level of self-efficacy and stress and the perceived severity of the children's problem behaviours is still markedly more pronounced in families of children with autism than in other clinical profiles or whether this has changed.

## Objectives

Objectives that guided this study are:

- To investigate differences in perceived stress levels in family management, educational style and co-parenting in parents of children with neurodevelopmental disorders
- To investigate differences in the presence of emotional-behavioural difficulties in children with neurodevelopmental disorders
- To investigate how mothers' and fathers' responses correlate with each other in different groups
- To investigate correlations between co-parenting, parents' perceived level of stress, emotional-behavioural difficulties in children and parents' perceived efficacy.

## Methods

### *Participants*

The present study involved 55 families of children with neurodevelopmental disorders. After the mortality of the sample, the analyses were carried out on a total of 54 mothers and 49 fathers. All the children involved are patients of the CRC- Centro Ricerca e Cura in Rome and are between 3,9 and 17,33 years old. The sample was divided into four clinical groups: Learning and Language Disorders (SLD/SLI), Autism (ASD), Stuttering (STU) and Hearing Loss (HL). Table 1.a/1.b shows the descriptive analyses of the sample for each reference group. The analyses will be reported separately for children (a) and for families (b).

For children, the distribution of the sample with respect to gender, nature of diagnosis, age and months of therapy to date for each clinical group is reported.

For families, the distribution of the sample was reported with respect to the presence of positive covid cases found in the household and the absence of a social network during the months of restriction. In addition, the pres-

ence of families in which only one of the parents lives with the children was reported, as well as the percentage of parents who are currently employed, specifying whether they work remotely or in an office.

Groups	N	Age (Min)	Age (Max)	Age (months)	Gender (M%)	Therapy (months)
SLD/SLI	15	64	154	111.26 ± 25.24	53.33	33.26 ± 31.19
Hearing Loss	9	47	94	67.88 ± 17.47	55.55	44.77 ± 20.50
Stuttering	16	71	208	133.12 ± 36.39	81.25	10.12 ± 8.09
Autism	15	49	127	80.6 ± 21.44	93.75	36.26 ± 13.52

Tab. 1.a (Descriptive analysis of children's sample)

Groups	N	N brother	% single parent living with child	% positive Covid case	% absence of social network
SLD/SLI	15	1,2 (0.94)	13.33	26.66	33.33
Hearing Loss	9	0.77 (0.97)	0	11.11	0
Stuttering	16	0.66 (0.81)	18.75	6.25	12.5
Autism	15	0.93 (0.59)	6.66	3	26.66

Tab. 1.b (Descriptive analysis of families' sample)

### *Measures*

- The sense of parental competence

The sense of parental competence (Senso di Competenza Genitoriale, SCG; Vio et al., 1999), in its two versions for fathers and mothers, is a self-assessment questionnaire that explores, by means of 16 items on a 6-point Likert scale, the perception of self-efficacy in the use of educational strategies and the sense of satisfaction with one's parental role.

- Parental stress

Parental stress perception was investigated through the Parent Stress Index-Short form (PSI-SF, Abidin, 1995), an instrument based on the assumption that the stress present in interaction is generated not only by the child's characteristics but also by those of the parent. It is used to assess the parent's stress due to the parent's own behaviour, the child's characteristics and their interactions.

The PSI investigates three main domains of stressors:

1. Parental distress (assesses the level of distress a parent is experiencing in their own role, understood as arising from personal factors directly related to that role);
2. Dysfunctional parent-child interaction (focused on the parent perceiving the child as not meeting their expectations and furthermore the interactions with the child do not reinforce them as a parent);
3. Difficult child: focused on some fundamental characteristics of the child's behaviour, which make it easy or difficult to manage and which often originate in the child's temperament.

- Emotional and behavioural issues of the child

The Child Behaviour Checklist (CBCL) - Caregiver Report Form in its two versions for children from 1½ to 5 years (CBCL 1.5-5) and from 6 to 18 years (CBCL 6-18) (T. M. Achenbach et al., 2000, 2001) is composed of items that refer to the child's behaviour in the present and in the previous six months. The results reveal the presence of difficulties attributable to 8 syndromic scales: anxiety/depression, withdrawal/depression, somatic complaints, social problems, thinking problems, attention problems, rule-breaking behaviour, aggressive behaviour, which are grouped into two other general dimensions, internalization and externalization problems.

- Co-parenting

The ability of the parental couple to collaborate and work as a team was investigated through a specific questionnaire, the Co-parenting Scale-revised (CS) in the two versions for mother and father (Sapienza, University of Rome, In press). This instrument investigates the level of family integrity and conflicts within the parental dyad.

### *Procedures*

The study was carried out over 3 months, from July to September 2021.

The first step was to identify the families to be included in the sample, identifying an equal number of children for each of the clinical groups included.

Once the families had been identified and informed consent had been obtained to participate in the project, questionnaires were handed out for both parents to complete individually, for a total of 8 questionnaires per family.

Once the tests were completed, they were returned in a sealed envelope or by email in an anonymous form.

Some users had already completed some of the questionnaires included in the study. In this case, the scores obtained were recovered by including in the study the results of the tests administered from May 2021 to date.

### *Analytic plan*

The presence of significant differences between the groups in the different scales of the tests was investigated using one-way ANOVA analysis. When a significant difference was found, a post-hoc test was carried out using the Bonferroni test, with significant correction to identify false positives, to investigate in which groups these differences were really present (SPSS, 2009).

The correlation between the scores obtained by mothers and fathers for each subscale was measured in order to investigate the coherence of the answers given.

Also, the correlations between co-parenting, parents' perceived level of stress, emotional-behavioural difficulties in children and parents' perceived efficacy were measured, to understand if these measurements influence each other in the period under examination.

## Results

### *Correlations between mothers' and fathers' responses*

The correlation between the responses of fathers and mothers was calculated for each scale and subscale to assess the degree of coherence. The results are in the following table (Tab.2).

Test	Subscales	ASD	STU	SLD/SLI	HL
PSI-SF	Parental distress	0.668*(5)	0.296	0.470	0.517
	Dysfunctional Parent-Child Interaction	0.839*(7)	0.527	0.301	0.835*(6)
	Difficult child	0.755*(11)	0.737*(10)	0.869*(8)	0.945*(9)
	Total stress	0.863*(4)	0.768*(3)	0.640*(1)	0.846*(2)
SCG	Efficacy	0.377	0.511	0.235	0.625
	Satisfaction	0.660*(13)	0.397	0.032	0.309
	Total	0.554*(12)	0.120	0.139	0.604
CBCL	Internalizing problems	0.775*(19)	0.579*(18)	0.765*(17)	0.5598
	Externalizing problems	0.687*(20)	0.426	0.546	0.613
	Total problems	0.775*(16)	0.613*(15)	0.617*(14)	0.746
CS-R	Integrity	0.267	0.544	0.557*(21)	0.658
	Conflict	0.592*(23)	0.323	0.391	0.926*(22)

Tab. 2 (Correlation between mothers' and fathers' scores)

(1) p0.0183; (2) p0.0081; (3) p0.0057; (4) p0.0006; (5) p0.0064; (6) p0.0098; (7)p 0.0009; (8)p 0.0001; (9)p 0.0003; (10)p 0.0095; (11) p 0.0011; (12)p 0.0320; (13)p 0.0073; (14)p 0.0243; (15) p 0.0338; (16) p 0.0006; (17)p 0.0023; (18)p 0.0483; (19) p 0.0006; (20)p 0.0046; (21) p 0.0476; (22) p 0.0009; (23) p 0.0200

It can be observed that:

- The correlation between fathers' and mothers' responses in all groups is present only in the Parenting Stress Index- SF both in the Total scale and in the subscale Difficult Child.



- The correlation between fathers and mothers in three groups is present between SLD/SLI, Stutterers and Autistic and only in the CBCL, both in the Total scale and in the Internalizing Problems subscale.
- The correlation is present in all the scales and subscales, except for the subscale Efficacy of the questionnaire SCG.
- In all scales and subscales the more frequent correlation is between parents of children with Autism. The second in between parents of children who stutter.

### *Mean difference between groups*

The mean difference between groups (ASD, STU, SLD/SLI, HL), in each subscale in each parent, was measured with one-way ANOVA (total 24 one-way ANOVA). The results are in the following table (Tab. 3).

<b>Test</b>	<b>Subscales</b>	<b>ANOVA MOTHERS perception (significant results)</b>	<b>Bonferroni post-hoc MOTHERS (with correction)</b>	<b>ANOVA FATHERS perception (significant results)</b>	<b>Bonferroni post-hoc FATHERS (with correction)</b>
PSI-SF	Parental distress	$F(3,50)=0,9; p=0,429$		$F(3,45)=1,2; p=0,30$	
	Dysfunctional parent-child interaction	$F(3,50)=2,6; p=0,0559$		$F(3,45)=4,8; p=0,005$	ASD>STU
	Difficult child	$F(3,49)=3,1; p=0,034$	SLD/SLI>STU	$F(3,45)=2,7; p=0,054$	
	Total	$F(3,49)=2,8; p=0,049$	SLD/SLI>STU	$F(3,45)=3,4; p=0,025$	FALSE POSITIVE
SCG	Efficacy	$F(3,50)=0,22; p=0,878$		$F(3,46)=1,91; p=0,140$	
	Satisfaction	$F(3,50)=3,35; p=0,083$		$F(3,46)=1,96; p=0,132$	
	Total	$F(3,50)=1,17; p=0,327$		$F(3,46)=0,18; p=0,902$	

CBCL	Internalizing problems	$F(3,47)=2,08; p=0,115$		$F(3,44)=0,98; p=0,407$	
	Externalizing problems	$F(3,47)=4,1 p0,011$	SLD/SLI>STU	$F(3,44)=1,46; p=0,193$	
	Total	$F(3,47)=4,3; p0,008$	SLD/SLI>STU	$F(3,44)=3,2; p0,030$	SLD/SLI>STU
CS-R	Integrity	$F(3,49)=1,33; p=0,272$		$F(3,45)=2,40; p=0,079$	
	Conflict	$F(3,49)=1,01; p=0,392$		$F(3,45)=1,27; p=0,292$	

Tab. 3 (One-way ANOVA results with Bonferroni correction)

It can be observed that:

– PSI-SF

With regard to the perception of stress significant differences in the scores emerge:

- In mothers between the SLD/SLI and Stuttering groups both in the Total Score and in the subscale Difficult Child
- In fathers between the Autism and Stuttering groups the difference is only in the subscale Dysfunctional Parent-Child Interaction

CBCL

With regard to the perception of emotional-behavioural difficulties in children significant differences emerge:

- In the Total score both mothers and fathers have significant differences between SLD/SLI and Stuttering.
- Only in mothers in Externalizing Problems is there a difference between Autism and Stuttering.

SCG and CS

SCG

There were no significant differences between groups in the Senso di Competenza Genitoriale (parental sense of competence) test.

CS-R

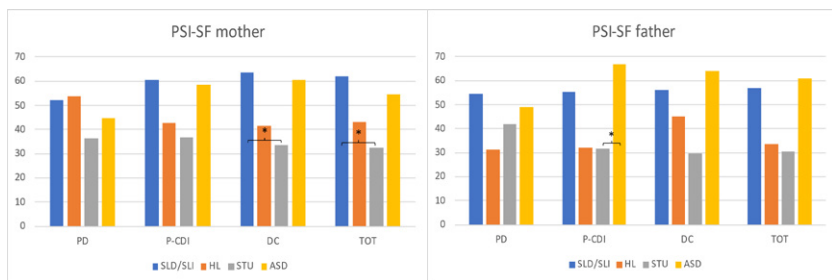
There were no significant differences between groups in the Coparenting Scale Revised.

- All significant differences involve the stuttering sample and always as less than the others. And, as mentioned before, only in the PSI-SF and CBCL tests.

In the following images the graphs between the comparisons between means and significance:

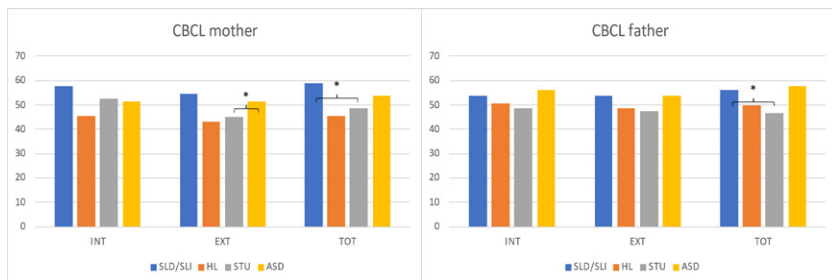
### PSI-SF

*Img 1.1 Comparison between means and significance PSI-SF*



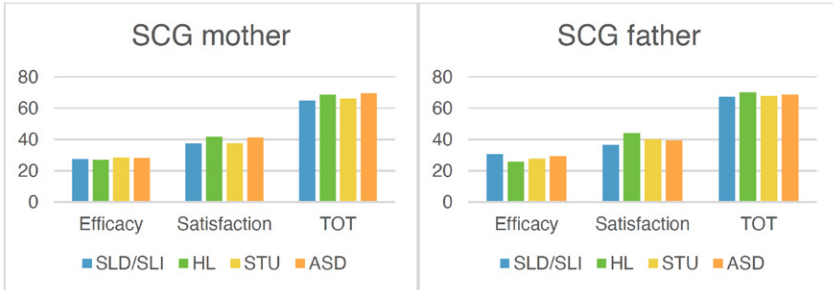
### CBCL

*Img 1.2 Comparison between means and significance CBCL*



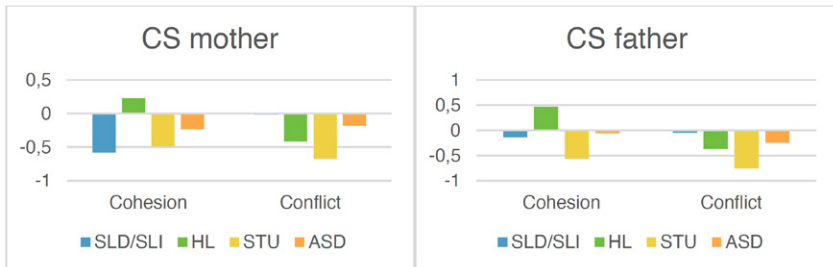
### SCG

Img 1.3 Comparison between means and significance SCG



### CS-R

Img 1.4 Comparison between means and significance CS-R



### Correlations between measures

Some measures have been correlated as shown in the following table (Tab.4).

	PSI-SF Tot	SCG Tot	CBCL Tot	CS Conflict	CS Integrity
PSI-SF Tot	1	x	x	x	x
SCG Tot		1	/	/	x

CBCL Tot			1		x
CS Conflict				1	x
CS Integrity					1

Tab. 4 (Correlation between measures)

The results of correlations, both in fathers and mothers and in all 4 groups, are shown in the following tables (Tab.5):

### Stuttering (STU)

STU Mothers	PSI-SF Tot	SCG Tot	CBCL Tot	CS Conflict	CS Integrity
PSI-SF Tot	1	-0,398	0,429	0,175	-0,557 (1)
SCG Tot		1	/	/	-0,107
CBCL Tot			1	-0,319	-0,141
CS Conflict				1	-0,009
CS Integrity					1

Tab. 5.1 (Correlation between measures in STU mothers)

(1) p 0,0307

STU Fathers	PSI-SF Tot	SCG Tot	CBCL Tot	CS Conflict	CS Integrity
PSI-SF Tot	1	-0,681 (1)	0,422	0,220	-0,760 (2)
SCG Tot		1	/	/	0,593
CBCL Tot			1	0,081	-0,504
CS Conflict				1	-0,194
CS Integrity					1

Tab. 5.2 (Correlation between measures in STU fathers)

(1) p 0,0209; (2) p 0,0066

## Autism Spectrum Disorder (ASD)

ASD Mothers	PSI-SF Tot	SCG Tot	CBCL Tot	CS Conflict	CS Integrity
PSI-SF Tot	1	-0,722(1)	0,755 (2)	0,546 (3)	-0,358
SCG Tot		1	/	/	0,514 (4)
CBCL Tot			1	0,264	-0,544 (5)
CS Conflict				1	-0,218
CS Integrity					1

Tab. 5.3 (Correlation between measures in ASD mothers)

(1) p 0,0023; (2) p 0,0011; (3) p 0,0349; (4) p 0,0497; (5) p 0,0358

ASD Fathers	PSI-SF Tot	SCG Tot	CBCL Tot	CS Conflict	CS Integrity
PSI-SF Tot	1	-0,493	0,775 (1)	0,218	-0,249
SCG Tot		1	/	/	0,618 (2)
CBCL Tot			1	-0,149	-0,491 (3)
CS Conflict				1	0,308
CS Integrity					1

Tab. 5.4 (Correlation between measures in ASD fathers)

(1) p 0,0006; (2) p 0,0140; (3) p 0,0628

## Specific Learning Disorder / Specific Language Impairment (SLD/SLI)

SLD/SLI Mothers	PSI-SF Tot	SCG Tot	CBCL Tot	CS Conflict	CS Integrity
PSI-SF Tot	1	0,432	0,830 (1)	0,662 (2)	-0,256
SCG Tot		1	/	/	0,348

CBCL Tot			1	0,542	0,055
CS Conflict				1	-0,278
CS Integrity					1

Tab. 5.5 (Correlation between measures in SLD/SLI mothers)  
 (1) p 0,0004; (2) p 0,0137

<b>SLD/SLI Fathers</b>	<b>PSI-SF Tot</b>	<b>SCG Tot</b>	<b>CBCL Tot</b>	<b>CS Conflict</b>	<b>CS Integrity</b>
PSI-SF Tot	1	-0,104	0,305	0,320	-0,265
SCG Tot		1	/	/	-0,475
CBCL Tot			1	0,674 (1)	0,428
CS Conflict				1	0,420
CS Integrity					1

Tab. 5.6 (Correlation between measures in SLD/SLI fathers)  
 (1) p 0,0160; (2)

### Hearing Loss (HL)

<b>HL Mothers</b>	<b>PSI-SF Tot</b>	<b>SCG Tot</b>	<b>CBCL Tot</b>	<b>CS Conflict</b>	<b>CS Integrity</b>
PSI-SF Tot	1	-0,469	0,909 (1)	0,867 (2)	0,184
SCG Tot		1	/	/	0,324
CBCL Tot			1	0,639	-0,167
CS Conflict				1	0,491
CS Integrity					1

Tab. 5.7 (Correlation between measures in HL mothers)  
 (1) p 0,0118; (2) p 0,0251

<b>HL Fathers</b>	<b>PSI-SF Tot</b>	<b>SCG Tot</b>	<b>CBCL Tot</b>	<b>CS Conflict</b>	<b>CS Integrity</b>
PSI-SF Tot	1	-0,091	0,555	0,663	0,236
SCG Tot		1	/	/	0,402
CBCL Tot			1	0,440	0,133
CS Conflict				1	0,307
CS Integrity					1

Tab. 5.8 (Correlation between measures in HL fathers)

It can be observed that:

- The frequencies of significant positive correlations are:
  - 3 PSI-SF TOT – CBCL
  - 2 PSI-SF – CS Conflict
  - 2 SCG – CS Integrity
  - 1 CBCL – CS Conflict

So, there are positive correlations between stress and child symptoms (the most common); between stress and parental conflict; between sense of competence and sense of parental cohesion (integrity) and between child symptoms and parental conflict.

- The frequencies of significant negative correlation are:
  - 2 PSI-SF – CS Integrity
  - 2 CBCL -CS Integrity
  - 2 PSI- SF – SCG

There are negative correlations between stress and sense of parental competence, stress and sense of parental cohesion (integrity), between child symptoms and sense of parental cohesion (integrity).

- Only in stuttering there is, both in father and mother, a negative correlation between stress and a sense of parental cohesion.



## Discussion

In the literature, there are several studies that attest that the parents of children with autism have a higher level of parental stress and a greater perception of clinical externalizing behaviors in their children, compared to the parents of children with other clinical profiles and with typical development (Di Renzo, Bianchi di Castelbianco et al., 2020; Hayes and Watson, 2013; Lecavalier, Leone, Wiltz, 2006).

In the present study, which uses the post lockdown period for covid 2019 as a reference, we were unable to replicate these results. As reported in Table 3, the only significant difference regarding autism, with respect to the variable perceived parental stress, is present only in fathers and only in the specific dysfunctional parent child interaction subscale of the PSI-SF, and only in relation to the stuttering sample. The other significant differences are always found between the SLD / SLI and STU groups, with the latter always minor, in the difficult child and total (mothers) scales of the PSI-SF, and in the externalizing problems (mothers) and total (mothers and fathers) scales of the CBCL. In our opinion, a possible interpretation of these results could be linked to the influence of the Covid variable and the variations that it necessarily entailed, with its consequences, in family management and emotions. However, we do not have current data to support this hypothesis, which we intend to test in subsequent studies.

Recent research by Giannotti, Mazzoni et al. (2021) reports how parents' ability to team up and cooperate in managing their children during the pandemic period has constituted a protective factor able to contain stress perception. We wanted to test these hypotheses in our sample but in the recent post lockdown period. In the present study we found that only in the stuttering sample did a greater parental ability to cooperate lead to a lower perception of perceived stress in family management. As can be seen in Tables 5.1 and 5.2, both mothers and fathers of stuttering children have a negative correlation between perceived stress (measured with PSI-SF) and sense of family cohesion (measured with the Integrity scale of the CS). This is not the case in the other samples. We tried to guess why. Let's assume that the stuttering sample is different from the others due to its characteristics. We believe that the impairment in family management it involves is less

pervasive than the other disorders considered, but parental management is more similar to that of typically developing families. Indeed, if we analyze the comparative means in the PSI-SF and in the CBCL (Image 1.1 and 1.2) we note that those of the stuttering sample are often among the lowest, and are always the lowest point of reference among the significant differences. This could make it easier to develop a greater sense of family cohesion, related to a lower perception of stress. And vice versa, a lower perception of stress can be the basis for forming a better sense of cohesion in family management.

### Limitations

Here are some limitations of our study:

- Small sample size (Tab 1.a). The sample should be expanded.
- There is a statistically significant difference in the mean age (months) of the groups under examination ( $F(3,51)=15.40$ ;  $p<0.001$ ). From the post-hoc analyses after Bonferroni's correction it emerges that:
  - Autism group ( $80.6 \pm 21.44$ ) is made up of children of a significantly lower age than the DSA/DSL group ( $111.26 \pm 25.24$ ;  $p = 0.001$ ) and the stuttering group ( $133.12 \pm 36.39$ ;  $p<0.001$ )
  - Hearing loss group ( $67.88 \pm 17.47$ ) had significantly lower scores than the DSA/DSL group ( $111.26 \pm 25.24$ ;  $p < 0.001$ ) and the stuttering group ( $133.12 \pm 36.39$ ;  $p<0.001$ ).
- Absence of a pre-pandemic clinical comparison sample. - Absence of a comparative sample of a parent with children without neurodevelopmental diseases.
- In the CBCL, in order to compare the two versions for different age groups, only the total scales had to be taken into consideration.

### Conclusions

The analysis of the results of our research conducted in reference to the post lockdown period reveals that parents of children with autism do not seem to have higher levels of stress perception than parents of children

with other diagnoses. This finding may indicate a change from the family dynamics prior to the pandemic. However, further future research may reveal more information. Some research conducted during the pandemic period also found that the ability of the parental couple to cooperate and team up to manage the family was a protective factor in containing levels of perceived stress. Our results allow us to confirm this only with regard to the sample of stutterers.

## **Legend**

### *Tests*

CBCL – Child Behavior CheckList  
CS-R – Coparenting Scale Revised  
PSI-SF – Parent Stress Index Short Form  
SCG – Senso di Competenza Genitoriale  
PD – Parental Distress  
DPCI – Dysfunctional Parent Child Interaction  
DC – Difficult Child

### *Groups*

ASD – Autism Spectrum Disorder  
HL – Hearing Loss  
SLD/SLI – Specific Learning Disorder/Specific Language Impairment  
STU – Stuttering

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## **THE «ICEBERG» PROJECT-TREATMENT OF FLUENCY DISORDER IN SCHOOL-AGE CHILDREN**

Anna Trucco, Anna Accornero, Maristella Crielesi, Stefano Monte

*The project has won the FLI Piemonte-Corep scholarship in collaboration with CIRP Social Cooperative and University of Torino.*

### ABSTRACT

Stuttering is a complex, multifactorial and multidimensional disorder, featuring a «covert» and an «overt» component. It is therefore crucial to provide multidimensional evaluation and therapy, both general and tailored to the patient's need, as recommended by the scientific literature and especially by the Dutch Logopedic Guidelines (Pertijs, 2014). Thus, the project aimed at improving the stuttering disorder through an individual treatment, a group treatment inspired by the MIDA-SP (Tomaiuolo et al., 2012) method and parenting coaching meetings guided both by a speech therapist and a psychotherapist. The analysis at the end of the project shows that the aforementioned holistic treatment improves the stuttering subjects. As a matter of fact, the latter show relevant improvements in both the «covert» and «overt» aspects of the disorder.

### Objectives

This project aims to improve the effectiveness and quality of children and parent's communication. The specific goals include:

- short term: muscle relaxation, body awareness, breathing, vocal and articulation exercises;
- mid-term: acquisition of verbal facilitation tools and stuttering management techniques;
- long-term: application of the techniques acquired, improvement of communication skills, enhancement of personal and relational skills, as well as self-esteem.

## Methods

The project provided individual assessment of the disorder and specific programmes of verbal facilitation techniques. The children, who were split in two groups composed by two people each in accordance with Covid-19 regulations, took part in a musical theatre course with a focus on transfer activities and mediated-art training (drawing from the MIDA-SP method), including interpretive reading, improvisation, video recording, music and rhythm games, dubbing and an end-of-project performance. A parenting class, led by a speech therapist and a psychotherapist was carried out at the same time with the aim of raising awareness of the disorders, as well as the project's goals and tools. The organisers acknowledged the parent's emotions and reactions and provided suggestions to boost the child's development, their interaction with family and society at large.

## Results

The project proposes a holistic approach to speech disorders by placing participants in a group in which they can both communicate and observe other people with a comparable speech disorder. This project is the evolution of the previous experience of the musical theater laboratory «Dammi 3 Parole» for subjects with stuttering in school-age children, presented to the I.C.O.S. 2018. This experience had produced positive outcomes with regards to the participants' communicative attitude.

The first workshop group of the «Iceberg project» aimed at children aged from 10 to 13 years old and was held from October to March. The second one was for children aged 6 to 9 and was held from March to July.

A both qualitative and quantitative analysis conducted before and after the treatment revealed an overall improvement of the verbal fluency (TABLE 1 AND 2), greater prosodic richness and increased levels of articulation and vocal intensity awareness in both groups.

Moreover, we were able to observe some improvements with regards to the «covert» component of dysfluency, measured using the BAB test. Indeed,

we observed an average increase of +0.5 ds in the results when compared with the standardized CWS ones and +1, 5 ds in the results when compared with the standardized CWNS ones. About the meetings held with the parents, we adopted a questionnaire to run some interviews on the perceived effectiveness of the sessions held with the speech therapist and the psychotherapist, the individual treatment and the group treatment with the children.

The participants gave very positive opinions about the educational counseling, the parental coaching and the treatment of their children. They have indeed shown interest in continuing the rehabilitation project in the future, particularly regarding the group workshop proposal.

### Conclusions

Theatre and musical activities, direct speech therapy and indirect speech therapy through counselling in collaboration with a psychotherapist seem to considerably improve the quality of life of people who suffer from stuttering, by providing them with greater awareness of their abilities, better verbal and non-verbal communication skills. Greater chances of applying the skills acquired in daily life also lead to higher levels of self-esteem and fulfilment.

### Legends and tables

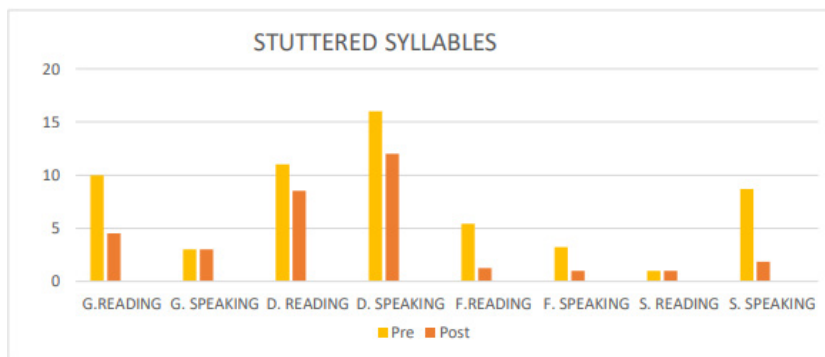


Table 1: Percentage of stuttered syllables in children (G., D., S., F.) before and after the Iceberg Project

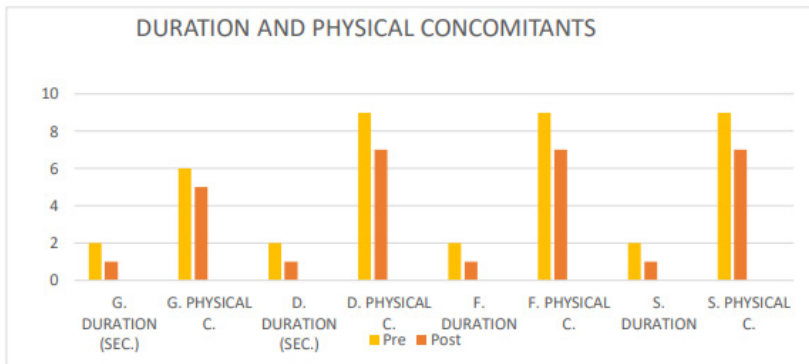


Table 2: Duration and Physical Concomitants in children (G., D., F., S.) before and after the Iceberg Project

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## EVALUATING THE EXPERIENCE OF STUTTERING AMONG POLISH ADULTS: NORMATIVE AND PSYCHOMETRIC INVESTIGATION WITH OASES-A

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### ABSTRACT

*The Overall Assessment of the Speaker's Experience of Stuttering* (OASES; Yaruss & Quesal, 2006; 2016) is a holistic, evidence-based approach to diagnostic and therapeutic decision making for children, teenagers and adults who stutter. Based on the World Health Organization's International Classification of Functioning, Disability, and Health (WHO, 2001; Yaruss & Quesal, 2004), the OASES enables therapists to gather information about the totality of the stuttering disorder, including its social, emotional, and cognitive aspects. There is still a limited number of standardized Polish diagnostic tools available which implement a multi-dimensional assessment approach for children who stutter. Therefore, a study to develop and evaluate a Polish version of the OASES-A (adult) was undertaken.

### Introduction

People who stutter are at risk of experiencing a lower quality of life due to the disorder (Craig, Blumgart, & Tran, 2009). Adults who stutter often face a variety of emotional challenges, such as fear, anxiety, shame, embarrassment and even social problems (Blumgart, Tran, & Craig,

2010). They also tend to experience negative behavioral challenges, for example, trying to avoid moments of stuttering, and cognitive reactions, such as feeling guilty about their stutter (Bloodstein, Bernstein Ratner, & Brundage, 2021; Guitar, 2019; Tichenor, & Yaruss, 2019). These affective, behavioral and cognitive reactions may affect their participation in social activities and functioning in the work environment (Bricker-Katz, Lincoln, & Cumming, 2013; Craig et al., 2009). Therefore, it is highly recommended that the stuttering diagnostic process is comprehensive in recognizing all dimensions of the stuttering disorder (Manning & DiLollo, 2018).

The *Overall Assessment of the Speaker's Experience of Stuttering* (OASES; 2006, 2016) was designed to explore and capture the impact a person experiences as a result of stuttering. Based on World Health Organization's International Classification of Functioning, Disability, and Health (WHO, 2001; Yaruss & Quesal, 2004) model, the tool allows for the description of variations in different individuals' experiences based on their personal and environmental contexts. The tool provides a comprehensive view of the stuttering disorder for both diagnostic and therapy evaluation purposes. The OASES is divided into 4 sections: (a) general information about stuttering, (b) the speaker's reactions to stuttering, (c) functional communication difficulties, and (d) quality of life.

So far, research on the quality of life of people who stutter (PWS) has not been conducted on a larger scale in Poland (Dziukiewicz, 2020; Ścibisz, & Węsierska, 2019; Woźniak, & Skibicka, 2021). Given that there is a lack of evidence-based and standardized Polish diagnostic tools available that implement a comprehensive assessment approach for adults who stutter, a study was undertaken to develop and evaluate a Polish version of the OASES for adults (OASES-A).

## **Rationale and summary of a study**

The general purpose of the present study was to develop a translation of the OASES-A for Polish-speaking adults and then to evaluate the validity and reliability of that translation.

### Participants

The OASES-A was distributed to 58 Polish speaking adults (26 women and 32 men) who stutter. Table 1 shows participants' demographics.

Sex	N	%	Age (years; months)			
			Minimum	Maximum	Mean	SD
Female	26	45	20;10	47;7	29;6	6;9
Male	32	55	21;1	52;8	29;5	7;9
Total	58	100	20;10	52;8	29;6	7;3

Table 1: Distribution of sex and age of participants

The mean age for the sample was 29 years and 8 months (ranging from 20y 10m to 52y 8m). The standard deviation was 7y 3m.

### Procedure

The original English version of the OASES-A was translated into Polish following a forward-backward translation process. The original English version was first translated into Polish by one of the members of the translation team who is a certified speech-language therapist and has a Master's degree in English Philology. This first Polish version was then back-translated by a qualified translator who is a bilingual Polish-English speaker. Next, this version of OASES-A was compared with its English equivalent by the research team. Finally, the differences between the two versions were discussed and revisions were made. The resulting OASES-A was administered individually to each participant. All respondents were native speakers of Polish who came from both urban and rural areas across Poland. Reliability (internal consistency) and validity for the Polish version were estimated.

## Results

Table 2 shows frequency distributions of Impact Ratings for the overall score and for the four individual OASES-A sections for Polish stuttering adults who completed the translated OASES-A.

<b>Impact Rating</b>	<b>Impact Scores</b>	<b>Section I</b>	<b>Section II</b>	<b>Section III</b>	<b>Section IV</b>	<b>Overall</b>
Mild	1.00 – 1.49	3.4%	3.4%	17.2%	17.2%	5.2%
Mild-Moderate	1.50 – 2.24	13.8%	27.6%	39.7%	27.6%	31.0%
Moderate	2.25 – 2.99	43.1%	32.8%	27.6%	29.3%	41.4%
Moderate-Severe	3.00 – 3.74	34.5%	25.9%	6.9%	13.8%	22.4%
Severe	3.75 – 5.00	3.4%	10.3%	8.6%	10.3%	0.0%

*Table 2: Frequency Distributions of Impact Ratings in the Standardization Sample for OASES-A Response Form*

Most participants declared that stuttering had a moderate (41.4%) or mild-moderate (31%) impact on their lives.

Most often, stuttering had a moderate (43.1%) or moderate-severe (34.5%) impact on participants' general impressions about their impairment and how they felt about it, moderate (32.8%) or mild-moderate (27.6%) impact on their emotional, cognitive and behavioral reactions to stuttering, mild-moderate (39.7%) or moderate (27.6%) impact on their communication in daily situations and moderate (29.3%) or mild-moderate (27.6%) impact on the quality of their lives.

### *Reliability*

Reliability (internal consistency) of four sections and overall OASES-A score are presented in table 3. Missing values were replaced with series means.

Section	Cronbach's alpha	Number of items
I: General Information	0.885	20
II: Your Reactions to Stuttering	0.941	30
III: Communication in Daily Situations	0.955	25
IV: Quality of Life	0.968	25
Overall Score	0.977	100

Table 3: Internal Consistency Reliabilities (Cronbach's alpha) of Impact Scores for the OASES-A Response Form

Both the Cronbach's alpha of each section and the total score of OASES-A were greater than 0.70 (ranging 0.885-0.977). The result indicates very strong internal consistency and reliability.

### Validity

In order to evaluate validity, the item-test correlations (table 4) and the correlations among the Impact Scores of four sections (table 5) were calculated.

I: General Information		II: Your Reactions to Stuttering		III: Communication in Daily Situations		IV: Quality of Life	
Item	Spearman's rho	Item	Spearman's rho	Item	Spearman's rho	Item	Spearman's rho
1	0.411**	21	0.714***	51	0.617***	76	0.792***
2	0.596***	22	0.652***	52	0.661***	77	0.786***
3	0.568***	23	0.700***	53	0.571***	78	0.718***
4	0.097	24	0.735***	54	0.666***	79	0.740***
5	0.480***	25	0.673***	55	0.589***	80	0.764***
6	0.123	26	0.650***	56	0.667***	81	0.712***
7	0.128	27	0.552***	57	0.677***	82	0.551***
8	0.267*	28	0.651***	58	0.603***	83	0.476***
9	0.033	29	0.684***	59	0.706***	84	0.532***
10	-0.099	30	0.766***	60	0.641***	85	0.618***
11	0.653***	31	0.402**	61	0.545***	86	0.512***

12	0.720***	32	0.396**	62	0.688***	87	0.749***
13	0.610***	33	0.419**	63	0.588***	88	0.556***
14	0.344*	34	0.643***	64	0.695***	89	0.640***
15	0.503**	35	0.594***	65	0.657***	90	0.692***
16	0.534**	36	0.646***	66	0.714***	91	0.593***
17	0.439**	37	0.534***	67	0.763***	92	0.516***
18	0.310*	38	0.557***	68	0.669***	93	0.820***
19	0.338*	39	0.466***	69	0.694***	94	0.719***
20	0.147	40	0.473***	70	0.598***	95	0.765***
		41	0.492***	71	0.661***	96	0.759***
		42	0.593***	72	0.410**	97	0.677***
		43	0.553***	73	-0.014	98	0.678***
		44	0.310*	74	0.482***	99	0.787***
		45	0.677***	75	0.521***	100	0.737***
		46	-0.055				
		47	0.158				
		48	0.700***				
		49	0.640***				
		50	0.641***				

\*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$   
 Table 4: Internal Structure Construct Validity - Item-test Correlations (Spearman's rho)

All items in Section 4 and almost all items in Sections 2 and 3 were positively correlated with the total OASES-A score (rho = 0.310 - 0.820). Some of the items in Section 1 are not related to the overall OASES-A score. Section 1 concerns general information about participants, not directly the impact of stuttering on the quality of life.

	<b>I: General Information</b>	<b>II: Your Reactions to Stuttering</b>	<b>III: Communication in Daily Situations</b>	<b>IV: Quality of Life</b>
<b>I: General Information</b>	1			

<b>II: Your Reactions to Stuttering</b>	0.537***	1		
<b>III: Communication in Daily Situations</b>	0.384**	0.666***	1	
<b>IV: Quality of Life</b>	0.069	0.729***	0.731***	1
<b>Overall Score</b>	0.576***	0.914***	0.862***	0.876***

\*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$

Table 5: Internal Structure Construct Validity – correlation between all sections and total OASES-A score (Pearson's  $r$ )

There were significant positive correlations between almost all OASES-A sections with each other ( $r = 0.384 - 0.731$ ) and with the overall OASES-A score ( $r = 0.576 - 0.914$ ). The results show that OASES-A can be considered a high validity test.

### *Practical implications*

Findings obtained through using this tool can have important therapeutic implications for the treatment of adults who stutter in Poland. Unfortunately, stuttering therapy for Polish people frequently aims at eliminating stuttering by using fluency shaping techniques and rarely includes work on beliefs and emotions or changing attitudes towards stuttering. Providing Polish SLPs with access to the OASES-A could encourage them to apply a comprehensive assessment to examine the disorder's overall impact and establish a therapy program tailored to the adult's individual needs. It is also possible that some people who stutter will feel empowered through gaining knowledge and obtaining a deeper understanding of their stuttering as a result of following a treatment program based on the OASES-A outcomes. The assumption is that it can minimize the negative impact of stuttering on the speaker's life.



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## **INTENSIVE GROUP THERAPY OF THE DAMSTÉGROEP IN THE NETHERLANDS: A PROVEN NECESSITY!**

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### ABSTRACT

For many years the Damstégroup ([www.damstegroep.nl](http://www.damstegroep.nl)) from the Netherlands, consisting of experienced stutter therapists, has been offering intensive group therapies for people who stutter (PWS). The author looked at the benefits of these training courses. The conclusion is that participants suffer significantly less from stuttering, they stutter less and they suffer less from negative feelings about stuttering. These results are also measured 9 months after the training. The conclusion may be drawn that intensive group therapy for stuttering given by the Damstégroup works!

### Introduction

This study investigated the benefits of the intensive group stutter therapies offered by the Damstégroup ([www.damstegroep.nl](http://www.damstegroep.nl)) in the Netherlands. These stutter therapies are given by experienced stutter therapists, trained in group work. The Damstégroup offers three training courses for adults and adolescents:

<b>Name</b>	<b>Content</b>	<b>Age</b>	<b>Intensity</b>
<b>RAP training</b> – relaxed speaking differently	Self confidence in communication	12-19 years	5 days in 3 months
<b>VIP training</b> – free in speech	Learn to talk without fear and no holding back	Adults	4 days in 2 months
<b>JES training</b> – your own speaking technique	Searching for the best speaking techniques	Adults	7 half days in 8 months

## Methods

Data was collected from participants of the training courses in 2018, 2019 and 2020, consisting of completed questionnaires with 15 questions. This questionnaire was designed by the stutter therapists who provide the training courses. Ultimately 45 completed questionnaires were processed. The answers to these questionnaires were statistically processed using a t-test. The questionnaires were completed at three different measurement moments, namely:

- T1- Pre-measurement for measuring the entry value
- T2 - Direct after the training measurement for measuring direct result
- T3- Follow-up post-test for measuring long-term generalized result

Table 1 below shows the amount of questionnaires used per training:

	T1-T2	T1-T3
RAP	19	5
VIP	16	6
JES	10	4
<b>Total</b>	<b>45</b>	<b>15</b>

*Table 1: amount of questionnaires used per training*

The differences between the initial measurement (T1) of the three different courses were also examined. Does the content of the training match the request for help from the PWS? The extent to which the negative feelings associated with stuttering such as fear and shame are experienced as less negative after the training was also examined.

## Results

These are the conclusions about the effect of intensive group stutter therapies on people who stutter in the shorter and longer term, as far as measured.

*Significantly less stuttering*

At the end of all three training sessions (RAP, VIP and JES), participants stutter significantly less. Participants in the VIP and JES training also stutter significantly less 9 months after the training.

*Less bothered by stuttering*

After the VIP and RAP training, the PWS suffer less from stuttering. They feel more free to speak, dare to speak more and feel that they communicate better than before the training. They feel less shame for stuttering and experience less physical tension. The participants in the RAP and JES training still suffer less from stuttering 9 months later.

*Less negative feelings such as fear and powerlessness*

VIP training participants say what they want to say more often and suffer less from uncertainty. They also experience less anxiety and sadness. The RAP participants feel less powerless.

*Participate in more activities*

The JES participants have less difficulty participating in activities such as shopping and making telephone calls.

*Freer to speak*

Improvements in speaking have also been measured in the long term. All participants who completed a follow-up measurement feel more free to speak 9 months after completing the training.

*Less burden in daily life*

The participants in the JES training find stuttering less difficult in daily functioning, such as at work and shopping, 9 months after the training.

Compared with results before training	Significant results directly after training			Significant results 9 months after training		
	RAP	VIP	JES	RAP	VIP	JES
1. Less stuttering	X	X	X	-	X	X
2. Less affected by stuttering	X	X	X	X	-	X
3. Less difficulty in participating in activities	-	-	X	-	-	X
4. Feel more free to speak	X	X	-	X	X	X
5. Dare to speak more	X	X	-	-	-	-
6. Dare to stutter more	-	-	X	-	-	-
7. Better communicator	X	X	-	-	-	-
8. Less embarrassed about stuttering	X	X	-	X	-	-
9. Less physical tension while speaking	X	X	-	-	-	X
10. Less feelings of uncertainty	-	X	-	-	-	-
11. Say what I want to say	-	X	-	-	-	-
12. Less feelings of fear	-	X	-	-	-	-
13. Less feelings of sadness	-	X	-	-	-	-
14. Less powerless feeling	-	X	-	-	-	-
15. Less feelings of shame	X	X	-	-	-	-

Table 2: significant results T1-T2 and T1-T3 per question

### *Appropriate training is chosen*

Participants of the stutter group training choose the training that suits them, as shown by the analysis of the pre-measurement. This analysis looked at the significant differences between the answers of T1 of the participants in the different groups. The content of the training is in line with the problems that the participants indicate that they experience in advance of the training. For example, the participants in the VIP training indicated at the start that they were particularly bothered by stuttering and that they experienced many negative emotions when stuttering, such as fear and shame. A lot of attention is paid to learning how to deal with this during the VIP training. At the start of the training, participants in the JES training indicate that they experience discomfort when participating in activities. This fits in with the goals of the JES training, in which we look for our own applicable speaking technique to speak more fluently.

In summary, it can be stated that the intensive group therapies for stuttering provided by the Damsté groep show a high yield with regard to the progress of stuttering within this research. The participants' perception of the stutter problem also changed for the better. Participants experience fewer negative feelings.

In the longer term, these benefits of group therapy persist in many of the participants who stutter, if measured. The results are still provisional, because the sample is too small to generalize for the entire population of people who stutter. It can also be concluded that the participants choose the training that matches their request for help.

### *Recommendations*

For the Damstégroup based on the results:

- Organize follow-up meetings to make sure that the results last longer
- Organize follow-up meetings so that participants keep meeting each other

For further research:

- Research into the difference in benefits between individual and group therapy
- Validate these data from participants using validated questionnaires

### *Shortcomings of this research*

- Very small amount of questionnaires used, especially concerning the long term effects
- Questionnaire is not validated
- Unknown if participants had individual stutter therapy before and/or after group therapy

### **Conclusions**

These results justify the conclusion that the intensive group therapies given by the specially trained and certified stutter therapists of the Damségroep offer a very successful approach for the stuttering participants, as far as measured. Speech therapists and stutter therapists can therefore come to see these group therapies as a very valuable addition to the individual stutter therapy they offer.

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