



The effect of emotion on articulation rate in persistence and recovery of childhood stuttering

Aysu Erdemir^{a,*}, Tedra A. Walden^a, Caswell M. Jefferson^a, Dahye Choi^b,
Robin M. Jones^a

^a Vanderbilt University, United States

^b University of South Alabama, United States

ARTICLE INFO

Keywords:

Stuttering
Articulation rate
Persistence and recovery
Emotion
Fluent versus disfluent speech

ABSTRACT

Purpose: This study investigated the possible association of emotional processes and articulation rate in pre-school age children who stutter and persist (persisting), children who stutter and recover (recovered) and children who do not stutter (nonstuttering).

Methods: The participants were ten persisting, ten recovered, and ten nonstuttering children between the ages of 3–5 years; who were classified as persisting, recovered, or nonstuttering approximately 2–2.5 years after the experimental testing took place. The children were exposed to three emotionally-arousing video clips (baseline, positive and negative) and produced a narrative based on a text-free storybook following each video clip. From the audio-recordings of these narratives, individual utterances were transcribed and articulation rates were calculated.

Results: Results indicated that persisting children exhibited significantly slower articulation rates following the negative emotion condition, unlike recovered and nonstuttering children whose articulation rates were not affected by either of the two emotion-inducing conditions. Moreover, all stuttering children displayed faster rates during fluent compared to stuttered speech; however, the recovered children were significantly faster than the persisting children during fluent speech.

Conclusion: Negative emotion plays a detrimental role on the speech-motor control processes of children who persist, whereas children who eventually recover seem to exhibit a relatively more stable and mature speech-motor system. This suggests that complex interactions between speech-motor and emotional processes are at play in stuttering recovery and persistency; and articulation rates following negative emotion or during stuttered versus fluent speech might be considered as potential factors to prospectively predict persistence and recovery from stuttering.

1. Introduction

Stuttering is a developmental disorder with an average age at onset of 30–36 months, and a lifetime incidence of 5–8% (Yairi & Ambrose, 2013). Approximately 75–85% of children who stutter recover from the disorder before age 7 with little or no professional treatment (Yairi & Ambrose, 1999, 2005, 2013), however, the remaining 15–25% continue to stutter into adulthood (Yairi & Ambrose, 1999). For those affected by the disorder, stuttering can have a significant and life-long negative impact on social (Van Borsel, Brepoels, & De Coene, 2011), educational (O'Brian, Jones, Packman, Menzies, & Onslow, 2011), and vocational development (Klein & Hood, 2004), as well as emotional well-being (Tran, Blumgart, & Craig, 2011; Treon, Dempster, & Blaesing, 2006). Also,

* Corresponding author at: Vanderbilt University School of Medicine, Vanderbilt Bill Wilkerson Center, Department of Hearing and Speech Sciences, 1215 21st Ave. South, MCE II Suite 8310, Nashville, TN 37232-8242, United States.

E-mail address: erdemiraysu@gmail.com (A. Erdemir).

<https://doi.org/10.1016/j.jfludis.2017.11.003>

Received 14 June 2017; Received in revised form 27 October 2017; Accepted 16 November 2017

Available online 22 November 2017

0094-730X/© 2017 Elsevier Inc. All rights reserved.

stuttering is associated with negative experiences such as bullying (Blood & Blood, 2007). Thus, it is imperative to develop a better understanding of factors contributing to the development of stuttering.

Despite an extensive body of literature investigating the mechanisms contributing to stuttering (for reviews, see Bloodstein & Bernstein Ratner, 2008; Conture & Walden, 2012; Yairi & Ambrose, 2005), the nature of the disorder is still poorly understood. Many scholars describe childhood stuttering as a complex and multifaceted disorder, and argue that a unidimensional characterization is not possible. At present, studies of the mechanisms contributing to recovery and persistence of stuttering are limited (Reilly et al., 2009; Ambrose, 2005, 2013; Yairi & Ambrose, 2013). Generally acknowledged, however, is that multiple factors contribute to persistence versus recovery from stuttering, including linguistic and phonological factors (Mohan & Weber, 2015; Watkins & Yairi, 1997; Yairi & Ambrose, 2005; Usler & Weber-Fox, 2015), speech-motor factors, (Spencer & Weber-Fox, 2014; Usler, Smith, & Weber, 2017), physiological/anatomical factors (Chang, Erickson, Ambrose, Hasegawa-Johnson, & Ludlow, 2008; Chang, Zhu, Choo, & Angstadt, 2015; Chang et al., 2017), cognitive factors (Chang et al., 2017), and temperamental/emotional factors (Ambrose, Yairi, Loucks, & Seery, 2015).

1.1. Stuttering, recovery and persistence

Factors that contribute to the onset of stuttering and possibly predict recovery and persistence are best detected before extensive experience with stuttering leads to its own impact on speech-motor execution, linguistic, cognitive, and emotional processes. This warrants increased longitudinal study of preschool-age children who are close to the onset of stuttering to disentangle factors that contribute to persistent stuttering from consequences of experience with stuttering. Also, treating children who stutter (CWS) as a single group, which often has been done in previous cross-sectional studies, might mask potential factors that lead to recovery/persistence, and may be one reason why findings are often mixed. Moreover, being able to predict persistency/recovery prospectively is important from a clinical perspective (Watkins & Yairi, 1997; Yairi, Ambrose, Paden, & Throneburg, 1996), since it would enhance our ability to identify CWS at high risk to persist and promote the continued development of early intervention tools for children at high-risk. Therefore, there is a clear need to identify factors that initiate, discontinue and perpetuate stuttering in young children.

Stuttering is characterized by disruption of speech fluency, which reflects a breakdown in the speech-motor system. Fluent speech requires accurately timed vocal movements that depend on a well-functioning speech-motor execution system. Therefore, speech-motor processes may play a role in persistent-recovery from childhood stuttering. In line with this, Spencer and Weber-Fox (2014) reported that persisting children compared to recovered children demonstrated poorer performance at their initial visit (which predicted eventual recovery or persistence) in speech articulation and novel non-word repetition tasks, both involving speech-motor programming and execution processes. In another longitudinal study of children aged 5;9-8;0 Usler et al. (2017) found that when compared with children who recovered, children with persistent stuttering exhibited higher lip aperture variability during production of sentences with varying lengths and syntactic complexities, indicating less refined and less mature articulatory speech-motor coordination. However, at the time of testing the children were already classified as persisting or previously recovered from stuttering. Ambrose et al. (2015), in a longitudinal study of 2-4 year-old children attempted to discover differences before the children were categorized into one of the two subgroups and reported greater speech kinematics variability as measured by jaw displacement and fundamental frequency variability in persisting than recovered children. However, the difference was documented only during the final visit, 2 years after the first visit, not at the first visit when children were within twelve months of the reported onset of stuttering.

Another key factor differentiating persisting and recovered stuttering could be temperament or emotion, as there is considerable evidence linking temperamental characteristics and emotional processes to stuttering in preschool-age children (see reviews by Conture, Kelly, & Walden, 2013; Jones, Choi, Conture, & Walden, 2014; Kefalianos, Onslow, Block, Menzies, & Reilly, 2012; cf. Alm, 2014). For example, a longitudinal study by Ambrose et al. (2015) showed that mothers of persistent children rated their children as having higher “negative affectivity” than mothers of recovered or control children. The children were 2-4 years of age and within 12 months of the reported onset of stuttering. Two components of the Negative Affectivity subscale of the Child Behavior Questionnaire (Rothbart, Ahadi, Hershey, & Fisher, 2001) differentiated the groups: fear and soothability. Persisting children were rated as more fearful and less soothable by their mothers. Further, a recent study by Chang et al. (2017) in which resting state fMRI scans were collected from children between 3;3-10;8 years of age found anomalous connectivity among brain networks that support attention, motor processes, perception and emotion, which predicted both stuttering status and stuttering persistence.

Articulation rate has long been considered to be a marker of the speech-motor execution system, as it depends on temporal coordination of respiratory, articulatory and phonatory processes (Hall, Amir, & Yairi, 1999; McClean & Tasko, 2003; Tasko, McClean, & Runyan, 2007; Tumanova, Zebrowski, Throneburg, & Kayikci, 2011). However, we propose that articulation rate reflects a combination of speech-motor execution and emotional processes (for the link between speech rate and emotion see Bachorowski & Owren, 1995; Johnstone & Scherer, 2000; Scherer, 2003), and could be an early marker to differentiate persistency from recovery. A few studies have investigated articulation rate of preschool-age children who are later categorized as exhibiting persistent or recovered stuttering (Hall et al., 1999; Kloth, Kraaimaat, Janssen, & Brutten, 1999); but to our knowledge no study has investigated articulation rate in relation to emotion in this population. Speech rate is known to depend on the emotional status of the talker (e.g., we talk faster when we are excited); however, we do not know whether emotion-related changes in speech rate differentiate recovered from persisting children. Since articulation rate reflects a combination of speech-motor execution and emotional processes, it could be associated with recovery or persistence of stuttering in young children.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات