



Responses of adults who stutter to the anticipation of stuttering



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ABSTRACT

Purpose: Many people who stutter experience the phenomenon of anticipation—the sense that stuttering will occur before it is physically and overtly realized. A systematic investigation of how people who stutter respond to anticipation has not been previously reported. The purposes of this study were to provide self-report evidence of what people do in response to anticipation of stuttering and to determine the extent to which this anticipation occurs.

Methods: Thirty adults who stutter indicated on a Likert rating scale the extent to which they anticipate stuttering and answered three open-ended (written) questions regarding how they respond to anticipation.

Results: All participants reported experiencing anticipation at least “sometimes,” and 77% of the participants reported experiencing anticipation “often” or “always.” The extent to which participants reported experiencing anticipation was not related to stuttering severity, impact, or treatment history. Analysis of written responses revealed 24 major categories, which were heuristically divided into *action* or *non-action* responses. Categories representing avoidance and self-management strategies were further divided into 14 and 19 subcategories, respectively. Participants were just as likely to view anticipation as helpful as they were to view it as harmful.

Conclusion: Findings demonstrate that most, if not all, adults who stutter experience anticipation, and the majority of adults who stutter report doing so at least often. Adults who stutter respond to this anticipation by altering the speech production process in various ways. Results highlight the importance of the role that anticipation plays in how stuttering behaviors manifest themselves.

Educational Objectives: The reader will be able to: (a) summarize existing literature on the anticipation of stuttering; (b) describe the role and extent of anticipation of stuttering in adults; (c) describe the various ways that adults who stutter respond to anticipation; (d) describe the importance of measuring anticipation in clinical and research domains.

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1. Introduction

Researchers have long studied the phenomenon of anticipation of stuttering (e.g., Alm, 2004; Arenas, 2012; Bakker, Brutten, Janssen, & Meulen, 1991; Bloodstein, 1972; Brocklehurst & Corley, 2011; Brocklehurst, Lickley, & Corley, 2013; Brutten & Janssen, 1979; Johnson & Sinn, 1937; Johnson & Solomon, 1937; Knott, Johnson, & Webster, 1937; Martin & Haroldson, 1967; Milisen, 1938; Packman & Onslow, 2000; Peters & Hulstijn, 1984; Sheehan, 1953; Van Riper, 1936). Broadly, anticipation refers to a speaker's proprioceptive and/or cognitive sense that he or she is about to stutter. Anticipation contributes to anticipatory anxiety, or anxiety about imminent stuttering (Alm, 2004; Bloodstein, 1960; Bowers, Saltuklaroglu, & Kalinowski, 2012), as well as generalized (or longer term) stuttering-related anxiety or fear based on prior experiences (e.g., Beilby, Byrnes, Meagher, & Yaruss, 2013; Plexico, Manning, & DiLollo, 2005; Plexico, Manning, & Levitt, 2009a; Tran, Blumgart, & Craig, 2011; Yaruss & Quesal, 2004).

Although the experience of anticipation is widely recognized, the nature and role of anticipation is not well understood. Early research on stuttering sought a causal relationship between anticipation and the moment of stuttering, using prediction of stuttering by a speaker as an indication of anticipation (Bloodstein, 1960; Johnson & Sinn, 1937; Johnson & Solomon, 1937; Knott et al., 1937; Van Riper, 1936; Wingate, 1975). This work assumed that if anticipation occurred, the speaker should be able to predict when a moment of stuttering would occur and signal that prediction (e.g., by raising a hand). People who stutter are not always able to signal prediction, however, because the sensation of an impending moment of stuttering may occur too closely in time to the moment of stuttering itself (i.e., there may not be enough time to raise a hand). Additionally, anticipation may cause a speaker to make some type of change in speech production (e.g., pausing, substituting a word), in which case the overt moment of stuttering may be averted completely.

Acknowledging inherent difficulties in using speakers' predictions about stuttering to study anticipation, as well as more general concerns about subjective reports, researchers turned to more objective measures to study anticipation. As a group, people who stutter exhibit pre-speech increases in pulse rate acceleration and vasoconstriction (Van Riper & Milisen, 1939), reductions in heart rate (Peters & Hulstijn, 1984; Weber & Smith, 1990), and increases in skin conductance (Bowers et al., 2012; Weber & Smith, 1990). Other physiological investigations of anticipation have revealed increases in orofacial muscle activation prior to overt stuttering (Murray, Empson, & Weaver, 1987; Shrum, 1967; Thürmer, Thumfart, & Kittel, 1983; Van Lieshout, Hulstijn, & Peters, 1996); longer visual fixation while reading words with high expectancy of stuttering (Bakker et al., 1991; Brutten & Janssen, 1979); changes in fundamental frequency, reduced speech rate, and aberrant formant transitions in the acoustic signal preceding stuttered events (Falck, Lawler, & Yonovitz, 1985; Knox, 1975); and abnormalities in recruitment of speech preparatory brain areas (Peters, Love, Otto, Wood, & Benignus, 1976; Salmelin, Schnitzler, Schmitz, & Freund, 2000; Walla, Mayer, Deecke, & Thurner, 2004). Adults who stutter also exhibit longer speech response times when producing words that they expect to be stuttered, or words that they perceive as being more "difficult" (Arenas, 2012; Van Lieshout, Ben-David, Lipski, & Namasivayam, 2014).

The studies above indicate that people who stutter develop the ability to anticipate moments of speech disruption. This anticipation can be a conscious process associated with high levels of awareness, or a more subconscious process associated with lower levels of awareness (e.g., Johnson & Sinn, 1937). If a speaker anticipates stuttering (whether conscious or subconscious), he or she may adopt an alternative speaking strategy (e.g., stalling, hesitation, substitution of words) in an attempt to compensate for or prevent the anticipated difficulty. While it is widely accepted that individuals who stutter develop strategies to cope with stuttering (for reviews, see Bloodstein & Bernstein-Ratner, 2008; Guitar, 2013; Johnson, 1959; Manning, 2009; Van Riper, 1971; Yairi & Seery, 2015), a systematic analysis of how those who stutter respond to anticipation has not been conducted.

Furthermore, the extent to which anticipation occurs has only been indirectly examined in two studies. Wingate (1975) collected subjective reports of speaker prediction ability which revealed that nine of ten participants were able to predict stuttering at least "sometimes," though no correlation was found between prediction and *actual* moments of overt stuttering. In a more recent study, Vanryckeghem, Brutten, Uddin, and van Borsel (2004) used the Behavior Checklist (BCL) to examine self-reported coping responses to "anticipation **and/or** speech disruption" (p. 237; emphasis added). They reported that adults who stutter employed substitutions "somewhat frequently," whereas pausing before saying a feared word and using starter phrases and interjections were incorporated "infrequently" to "somewhat frequently." Given the format of the BCL, participants in Vanryckeghem et al. (2004) were restricted to responding to pre-determined behaviors, so they were not able to describe these behaviors themselves. Thus, the extent to which the participants experience anticipation may have been underestimated.

The covert nature of anticipation could lead many speech-language pathologists (SLPs), especially those who are less experienced, to under-report the presence of anticipation. If anticipation is a common experience for many people who stutter, those who work with this population should be adept at identifying it, as well as supporting productive responses to it. In order to more directly and accurately measure anticipation, it is necessary to gain a deeper understanding of the phenomenon. The purposes of the present study were (1) to provide a systematic, qualitative analysis of anticipation of stuttering, with a particular focus on what people who stutter do when they anticipate stuttering; and (2) to measure the extent to which anticipation occurs in adults who stutter. This analysis will facilitate future quantitative investigations of the anticipation of stuttering. This study will also provide clinicians with information to improve their ability to measure the extent of anticipation and tailor their interventions to help people who stutter manage this difficult-to-observe but seemingly ever-present feature of stuttering.

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