



Behavioral inhibition and childhood stuttering



Dahye Choi^{a,*}, Edward G. Conture^a, Tedra A. Walden^b, Warren E. Lambert^c,
Victoria Tumanova^a

^a Department of Hearing and Speech Sciences, Vanderbilt University, 1215 21st Avenue South, Suite 8310 MCE South Tower, Nashville, TN 37232-8242, United States

^b Department of Psychology and Human Development, Peabody College, Vanderbilt University, 230 Appleton Place, Nashville, TN 37203-5721, United States

^c Statistics and Methodology Core at Vanderbilt Kennedy Center, 203 One Magnolia Circle, Nashville, TN 37203-5721, United States

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ABSTRACT

Purpose: The purpose of this study was to assess the relation of behavioral inhibition to stuttering and speech/language output in preschool-age children who do (CWS) and do not stutter (CWNS).

Method: Participants were preschool-age (ages 36–68 months), including 26 CWS (22 males) and 28 CWNS (13 males). Participants' behavioral inhibition (BI) was assessed by measuring the latency to their sixth spontaneous comment during conversation with an unfamiliar experimenter, using methodology developed by Kagan, Reznick, and Gibbons (1989). In addition to these measures of BI, each participant's stuttered and non-stuttered disfluencies and mean length of utterance (in morphemes) were assessed.

Results: Among the more salient findings, it was found that (1) there was no significant difference in BI between preschool-age CWS and CWNS as a group, (2) when extremely high versus low inhibited children were selected, there were more CWS with higher BI and fewer CWS with lower BI when compared to their CWNS peers, and (3) more behaviorally inhibited CWS, when compared to less behaviorally inhibited CWS, exhibited more stuttering.

Conclusions: Findings are taken to suggest that one aspect of temperament (i.e., behavioral inhibition) is exhibited by some preschool-age CWS and that these children stutter more than CWS with lower behavioral inhibition. The present results seem to support continued study of the association between young children's temperamental characteristics and stuttering, the diagnostic entity (i.e., CWS versus CWNS), as well as stuttering, the behavior (e.g., frequency of stuttered disfluencies).

Educational objectives: After reading this article, the reader will be able to: (a) summarize the salient empirical findings in the extant literature with regard to the association between temperament and childhood stuttering; (b) describe the concept of behavioral inhibition (BI) as well as the methods to measure BI; and (c) discuss the association between behavioral inhibition and childhood stuttering in preschool-age children.

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* Corresponding author. Tel.: +1 615 438 3134; fax: +1 615 936 6914.

E-mail addresses: da.h.choi@Vanderbilt.Edu (D. Choi), edward.g.conture@Vanderbilt.Edu (E.G. Conture), tedra.walden@Vanderbilt.Edu (T.A. Walden), warren.lambert@Vanderbilt.Edu (W.E. Lambert), victoria.tumanova@Vanderbilt.Edu (V. Tumanova).

1. Introduction

1.1. Temperament and developmental stuttering

Recent reviews suggest that increased attention is being paid to the possible association between temperament and childhood stuttering (Conture, Kelly, & Walden, in press; Kefalianos, Onslow, Block, Menzies, & Reilly, 2012; Seery, Watkins, Mangelsdorf, & Shigeto, 2007). Temperament, as defined by Rothbart and Bates (1998), can be described as “constitutionally-based individual differences in emotional, motor and attentional reactivity and self-regulation. . . (that are) relatively stable over time” (p. 109). Sanson, Hemphill, and Smart (2004) further suggest that such “. . . constitutionally-based differences in behavioral style. . . are visible from the child’s earliest years” (p. 143). These constitutionally or biologically based components include genetic as well as non-genetic elements such as prenatal, environmentally based variables (e.g., prenatal drug exposure), birth complications, and perinatal influences present in the child’s early rearing environment.

Regarding the possible association between temperament and childhood stuttering, in a recent review, Kefalianos et al. (2012) cautiously concluded that there may be some association between temperament and stuttering during the preschool years. The cautious nature of their conclusion resulted from several factors, none the least of which being the relatively small number of published studies as well as inconsistencies among findings. However, using independent replication of findings as a guideline for “trustworthiness” of findings, Kefalianos et al. noted some consistencies, that is, preschool-age children who stutter (CWS), when compared to preschool-age children who do not stutter (CWNS), appear to exhibit (1) lower adaptability (Anderson, Pellowski, Conture, & Kelly, 2003; Howell et al., 2004; Schwenk, Conture, & Walden, 2007) (2) lower attention span/persistency (Howell et al., 2004; Karrass et al., 2006; Schwenk et al., 2007), (3) more negative quality of mood (Howell et al., 2004; Johnson, Walden, Conture, & Karrass, 2010) and (4) higher activity level (Embrechts, Ebben, Franke, & Van de Poel, 2000; Howell et al., 2004). In addition, several empirical studies, not reported in the above review, have also shown that CWS, when compared to CWNS, are more emotionally reactive to environmental stimuli (Karrass et al., 2006; Wakaba, 1998) as well as lower in inhibitory control (i.e., the capacity to plan and suppress inappropriate approach responses under instructions or in novel or uncertain situations) and attention shifting (Eggers, De Nil, & Van den Bergh, 2010). In brief, various aspects of temperament appear to be associated with childhood stuttering, involving attention, affect/mood, adaptability, reactivity to their environment, and inhibitory control.

Such between-group differences, although clearly warranting further empirical assessment, as suggested by Kefalianos et al. (2012), may reflect real differences between CWS and CWNS based on Eggers, De Nil, and Van den Bergh’s (2009) findings. Specifically, Eggers et al. reported a similar, highly congruent three-factor temperament structure for children who stutter, children who do not stutter and children with vocal nodules. Eggers et al. concluded that any possible differences between CWS and CWNS on various indexes of temperament reflect real differences and are not the result of differences in underlying temperamental construct(s).

Based on the findings reviewed above, it has been theorized that the temperamental processes of children who stutter may also contribute to the difficulties these children have establishing normally fluent speech (Conture & Walden, 2012; Conture, Walden, Arnold, Graham, Harfield, & Karrass, 2006; Walden, Frankel, Buhr, Johnson, Conture, & Karrass, 2012). For example, Conture et al.’s (2006) Communication–Emotion (C–E) model suggests that temperamental factors (e.g., emotional reactivity or emotion regulation) may exacerbate the speech disfluencies of children who stutter. According to the C–E model, emotional reactivity may be associated with detecting/reacting to speech errors whereas emotion regulation may be related to changing, correcting and/or coping with covert/overt speech/language errors. These responses, according to the C–E model, are thought to contribute to *quantitative* (e.g., frequency) and/or *qualitative* (e.g., types and duration) change in stuttering. More recently, Conture and Walden (2012) proposed a dual diatheses–stressor framework (DD–S), in which diatheses (i.e., vulnerabilities) and stressors relating to emotion and speech–language processes are associated with childhood stuttering (for general review of diathesis–stress models, see Monroe & Simons, 1991). The DD–S model predicts that emotional reactivity, emotional regulation and their joint effects impact the frequency and severity of stuttering in preschool-age children (Walden et al., 2012).

1.2. Behavioral inhibition and developmental stuttering

To date, most studies of temperamental characteristics associated with childhood stuttering have relied upon caregiver reports (e.g., Eggers et al., 2009, 2010). Although questionnaires measuring temperamental characteristics have been shown to be valid (Rothbart, 2011; Rothbart & Bates, 1998; Thompson, 1999), it has been suggested that parents are biased informants (Strelau, 1998), and that a parent’s report about a child’s behaviors may not always yield the truest representation of the child’s actual behaviors (Kiel & Buss, 2006). Thus, as Kagan (2007) suggests, in order to best understand the temperament of individuals, one should assess temperament from at least three perspectives: parental report, behavioral observation, and psychophysiology. Given that there is a relative lack of research relating temperament and childhood stuttering using methods other than parental reports, one reasonable next step would be to examine temperamental dimensions of children by means of behavioral observation.

Kagan and his colleagues (Kagan, Reznick, Clarke, Snidman, & Garcia-Coll, 1984; Kagan, Reznick, & Gibbons, 1989; Kagan, Sidman, & Arcus, 1998) reported that one temperamental characteristic, behavioral inhibition (BI), can be measured reliably by means of behavioral observation. Behavioral inhibition is a temperamental characteristic that is

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