



RELATIONSHIP OF LENGTH AND GRAMMATICAL COMPLEXITY TO THE SYSTEMATIC AND NONSYSTEMATIC SPEECH ERRORS AND STUTTERING OF CHILDREN WHO STUTTER

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The purpose of this study was to evaluate whether increased utterance length and grammatical complexity are associated with changes in frequency of systematic speech errors (i.e., phonological processes, or sound changes affecting an entire class of sounds or sound sequence [Edwards & Shriberg, 1983]), and nonsystematic speech errors (i.e., a word or string of words that apparently deviates from the speaker's intention, but that is not characteristic of the child's systematic [phonological process]) of children who stutter (CWS). Subjects were 10 boys (S 's mean age = 50.6 months; $SD = 13.07$ months) who exhibited both stuttering and disordered phonology, each of whom was audiotaped and videotaped while interacting with his/her mother during a 30-minute play/conversation period. Twenty-five stuttered and 25 nonstuttered utterances from each subject's conversational speech sample were measured in terms of utterance length, grammatical complexity, and systematic and nonsystematic speech errors. An utterance was then categorized as "high" or "low" in length and grammatical complexity relative to the subject's median for each of the two variables, and then related to total frequency of systematic and nonsystematic speech errors. Results indicated that stuttered utterances were significantly more complex and longer than nonstuttered utterances; however, there were no significant differences in systematic and nonsystematic errors for either stuttered or nonstuttered utterances relative to the grammatical complexity or length of utterance. Findings were taken to suggest that increased length and/or grammatical complexity of an utterance does not influence the frequency of systematic and nonsystematic speech errors, but does seem, as others have shown, to influence the frequency of stuttering. © 2000 Elsevier Science Inc.

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INTRODUCTION

Thirty to 40% of children who stutter (CWS) reportedly have a concomitant phonological disorder (e.g., St. Louis & Hinzman, 1988; Wolk, Edwards, & Conture, 1993), considerably more than the 2 to 6% found in the general population (Beitchman, Nair, Clegg, & Patel, 1986). Although no totally adequate explanation for this fact exists, one speculation based on the Covert Repair Hypothesis (CRH) (Postma & Kolk, 1993), a hypothesis grounded in Levelt's (1989) psycholinguistic theory of speech production, suggests that both problems (stuttering and disordered phonology) relate to difficulties in phonological encoding (for an overview of the possible relationship between phonological disorders and stuttering, see Louko, Edwards, & Conture, 1990; Louko, Conture, & Edwards, 1999; Nippold, 1990; Paden & Yairi, 1996). However, as Yaruss and Conture (1996) report, stutterings are more apt to occur on non-systematic ("slips of the tongue") rather than systematic (phonological processes) speech errors. Thus, it is unclear what may cause both problems (stuttering and phonological disorders) to commonly co-occur in young children.

Perhaps one way to better understand why stuttering and phonological disorders commonly coexist is to explore whether variables that affect one may also affect the other. For example, increased length and grammatical complexity of utterances are known to influence stuttering (e.g., Bernstein Ratner & Sih, 1987; Logan & Conture, 1995; Yaruss, 1999). Thus, utterance length and grammatical complexity, as well as other linguistic variables (e.g., Aram & Kamhi, 1982; Camarata & Schwartz, 1985; Camarata & Leonard, 1986; Campbell & Shriberg, 1982; Menyuk & Looney, 1972; Pangos, Quine, & Klich, 1979; Paul & Shriberg, 1982; Shriberg & Kwiatkowski, 1980) may also influence systematic and nonsystematic speech errors. In addition, because both utterance length and grammatical complexity are known to increase with chronological age, such changes may also influence systematic and nonsystematic speech errors. Perhaps as Dell (1988) suggests, speech errors may occur because the speaker is trying to say too many words too quickly (for an overview of speech errors and self-repairs of same, see, e.g., Bredart, 1991; Butterworth, 1991; Levelt, 1983). In other words, when people who stutter (in)appropriately increase their utterance length (and rate of speech), it may lead them to increases in the frequency of their phonological errors. It seems reasonable to suggest that this might occur since increased utterance length requires a longer period of planning (i.e., increased time for cognitive/linguistic processing) and if this planning is rushed and/or interrupted, phonological errors, among other difficulties, may result. Although several researchers (e.g., Bernstein Ratner & Sih, 1987; Guitar, Shaefer, Donahue-Kilburg, & Bond, 1992; Logan & Conture, 1995; Logan & Conture, 1997) have reported that increased length and grammatical complexity of utterances are associated with increased stuttering, it remains unclear what ef-

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