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Article

The communicative intent of stuttered utterances

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Abstract

The purpose of the present study was twofold: (1) to determine if reported differences in speech fluency between assertive versus responsive speech acts persist when the length and complexity of those acts are controlled for and (2) to explore disfluent speech production across the subtypes of speech acts that comprise the two broad speech act categories of assertive and responsive. Child utterances were coded for communicative intent using Fey's taxonomy (1986) and for length and complexity. Results revealed that when grouping speech acts into assertive versus responsive, it is the length and complexity, rather than the communicative intent of the utterance that contributes to disfluent speech. Findings also reveal there are specific speech act subtypes that do not differ in complexity, but do differ in amount of speech disfluency. Thus, the communicative intent of the utterance does appear to contribute, at least, in part to difficulties maintaining fluent speech.

KEYWORDS: CHILD; STUTTERING; COMMUNICATIVE INTENT; ASSERTIVE; RESPONSIVE

1 Introduction

Communicative intent is considered to be a critical factor in pragmatic development (Ninio 1995) and has been defined as the speaker's purpose or underlying motivation regarding the message they are trying to communicate to the listener(s) (Grice 1968). The communicative intent of conversational speech

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acts can be broadly classified as responsive or assertive (Fey 1986). Research has shown that the assertive speech acts of children who stutter (CWS) are more likely to be disfluent than responsive speech acts and are also more likely to be longer and more complex than responsive speech acts (Weiss and Zebrowski 1992). However, it has not yet been confirmed if it is the communicative intent of these acts, the syntactic nature or, perhaps, a combination of the two that contributes to the marked difference in speech disfluency between assertive versus responsive utterances. In addition, to date, the analyses of communicative intent have been limited to these two general speech act categories and have not yet considered the multiple subtypes of speech acts that are represented within each category (see Table 1). Research is needed to determine if certain speech act subtypes in the category of 'assertive speech acts' (e.g., statement about a non-observable event or mental evaluation, disagreement, request for information) as well as those that are defined as 'responsive speech acts' (e.g., response to request for clarification, acknowledgment of speaker's comment) are particularly susceptible to disfluent speech production. Acquiring this information will allow to us to better understand the role of pragmatics in stuttering and whether or not this particular pragmatic variable should be considered in the assessment and/or treatment of CWS (Weiss 2004; cf. Ryan 2006).

There are multiple taxonomies that can be used to analyze communicative intent (e.g., Fey 1986; Klecan-Aker and Lopez 1984; Mehrabian 1972; Morford and Foldin-Meadow 1992; Roth and Spekman 1984). There are at least two key reasons why Fey's speech act coding analysis is the primary method that has been used to analyze the influence of communicative intent on stuttered speech. First, this method allows for valuable insight regarding specific verbalized intent (i.e., speech acts) that may be more vulnerable to disfluent speech (Logan 2003; Weiss and Zebrowski 1991; 1992), whereas other methods of intention analysis focus more exclusively on nonverbal forms of communicative intent (Duncan 1969; Mehrabian 1972; Morford and Foldin-Meadow 1992). Specifically, Fey's taxonomy separates verbal communicative intent into two broad categories, with each category comprised of multiple subtypes of speech acts. Assertive speech acts consist of comments regarding directly observable events, statements about non-observable events or mental evaluations, disagreements, requests for information, requests for attention, requests for clarification, and requests for action. By comparison, responsive speech acts consist of responses to requests for information, responses to requests for action, responses to requests for clarification, responses to requests for attention, and simple responses or acknowledgments of the communication partner's utterances. Thus, application of this taxonomy to stuttered utterances could potentially allow clinicians the ability to target or, at least, predict

(depending on their clinical focus) those specific speech act subtypes that may be more likely to compromise speech fluency.

The second reason Fey's method of coding of speech act analysis has been the preferred method is that the speech act subtypes described are based on verbalized behaviors that are concrete and easily identified. As a result, when applied to conversational samples (i.e., a naturalistic setting), as was the case in the present study, use of this method has been shown to have high levels of reliability (Adams *et al.* 2002; Bishop *et al.* 2000). Thus, in summary, this analysis is straightforward, easy to use, reliable, and can provide valuable insight into the specific speech act subtypes that may be more vulnerable to disfluent speech production. However, to date, the use of Fey's system with children who stutter has been limited to the assertive versus responsive categories and has not included a more distinct analysis of the relationship between stuttered speech and the individual speech act subtypes that comprise these categories.

For example, Weiss and Zebrowski examined the role of communicative intent in both parent output (1991) as well as child output (1992). In their initial study (1991) on this topic, Weiss and Zebrowski examined the assertiveness versus responsiveness of the speech of eight parents of CWS in comparison to that of eight parents of children who do not stutter (CWNS). Each parent's conversational sample with their child was analyzed for the parent's use of assertive versus responsive speech acts using a ratio proposed by Fey (1986). Results did not show a significant between-group difference for the speech act type used, suggesting that the communicative intent of the utterances produced by parents of children who stutter did not differ from children who do not stutter.

In their follow-up study, Weiss and Zebrowski (1992) analyzed the level of communicative demand placed on the child by the requests made by parents of the eight CWS and also analyzed the communicative intent of the utterances produced by these eight children in terms of whether they stuttered more when producing assertive or when producing responsive speech acts. Results revealed that the children were more disfluent when their responses required elaboration; those responses that had a higher level of communicative demand. For example, more disfluencies were produced when responding to the question, 'What did you do at school today?' than in response to a more direct question, such as, 'Do you want to play with the doll or the dinosaur?' Weiss and Zebrowski argued that these results lend support to the historical assumption that there is a positive correlation between level of responsibility required to answer questions and communicative breakdowns in CWS (e.g., Eisenson and Wells 1942; Stocker and Usprich 1976). In specific, the first question (i.e., 'What did you do at school today?') requires the child to formulate a novel answer without the benefit of shared context. In

contrast, the second question (i.e., 'Do you want to play with the doll or the dinosaur?') requires a response that is based on referents present in the communicative context, and as such, requires significantly less communicative responsibility on the child's behalf.

To further explore the role of communicative responsibility, Weiss and Zebrowski (1992) also analyzed whether or not the disfluent speech produced by these eight CWS differed depending on whether they were producing an assertive or a responsive speech act. Results showed that these children were significantly more fluent when responding to parental requests than when producing assertive speech acts. Thus, Weiss and Zebrowski further argued that to facilitate fluency, parents should be instructed to ask questions that place low conversational responsibility on the child. Additional support for this argument is found in similar research that did not use Fey's taxonomy, but did analyze stuttering relative to whether the child was responding to or initiating discussion.

Wilkenfeld and Curlee (1997) examined the speech fluency of three children who stutter immediately following questions that were initiated by their parents. Results revealed that these children did not demonstrate increased disfluency when responding to questions. Wilkenfeld and Curlee stated that the children were likely fluent when producing their responses because the questions the parents asked them were all related to toys that the child was playing with at the time – a shared referent. Similarly, Ryan (2000) found children tended to stutter when they were responsible for initiating the discussion; for example, when making statements, asking questions or giving commands. Taken together, these findings suggest that when producing assertive utterances children may be more likely to be disfluent as these types of utterances more frequently have an unshared rather than a shared context. That is, these types of utterances tend to have a higher level of communicative responsibility.

In addition to the likelihood that assertive utterances are those utterances that are characterized by increased communicative demand/responsibility, results from the Weiss and Zebrowski (1992) study also revealed that the assertive utterances tend to be significantly longer and slightly, but not significantly, more complex than responsive speech acts. However, there was no determination as to whether or not this difference would still be present between these two speech acts if length and complexity were controlled for in a statistical manner. Furthermore, Weiss and Zebrowski did not analyze for potential differences in disfluent speech production among the different assertive and responsive utterance subtypes. Rather, they analyzed all of the utterances as either being in the 'assertive' or in the 'responsive' category. Findings may have differed if the specific types of utterances within these broad categories were analyzed relative to speech fluency. Additional research is needed

to determine if certain types of utterances produce more disfluencies and if this difference in disfluent speech production is related to the communicative intent, the length and complexity of the utterance or a combination of both.

In summary, previous research indicates that CWS experience more frequent communicative breakdowns during assertive than during responsive speech acts, but it is not known whether those differences can be attributed solely to communicative intent or if they are, instead, moderated by the syntactic nature of the utterances. In addition, although assertive speech acts can fulfill a number of different roles (e.g., requests for information, comments regarding directly observable events, etc.), responsive speech acts can as well (e.g., responses to request for clarification, acknowledgment of the speaker's comment, etc.). Investigation of the fluency characteristics of the different subtypes of assertive and responsive speech acts is necessary to determine if one or more of the different subtypes of children's speech acts are more disfluent than others. Thus, the purpose of this study was twofold. First, to determine if the previously reported difference in disfluent speech production between assertive versus responsive speech acts still exists when length and complexity are taken into account. Second, to further our knowledge of the relationship between communicative intent and speech disfluency by investigating potential differences in disfluent speech production across the multiple subtypes of speech acts that comprise the two broad speech act categories of assertive and responsive.

2 Method

2.1 Participants

Participants were 15 children who stutter (CWS) (mean age = 4;7; SD = 19 mos; range = 2;4 to 7;10). The mean time since onset of stuttering was 18 months (range = 0.5–54 mos, SD = 17 mos). All participants presented with normal hearing, language and speech skills (with exception of stuttering) as reported by parents and observed during a formal speech-language evaluation by the first author, a certified speech language pathologist. The study was approved by the Institutional Review Board at The University of Texas at Austin and informed consent was obtained for each participant.

2.2 Classification and inclusion criteria

Speech, language, and hearing measures

Participants passed a bilateral pure tone hearing screening at 20 dBHL for 500, 1000, and 2000 Hz (ASHA, 1995). Fourteen of 15 children were administered and performed within normal limits (i.e., no less than 1 standard deviation below the mean) on the following two standardized speech-language tests: *The Peabody Picture Vocabulary Test-III* (PPVT-III; Dunn

and Dunn, 1981) and the *Expressive Vocabulary Test* (EVT; Williams 1997). Mean length of utterance (MLU), type and token ratio (TTR), were also calculated for each participant. Participant 11 (age = 2;4) was not eligible for completion of these standardized language tests as the PPVT-III and EVT are only normed for children ages 34 months and above. Thus, his analyses were limited to MLU and TTR. See Table 1 for a review of participant performance on each of these measures.

Criteria for diagnosis of stuttering

Certain criteria had to be met in order for participants to be considered children who stutter: (a) the children had to present with greater than three instances of stuttering (i.e., whole word repetitions, sound/syllable repetitions, and/or audible and inaudible sound prolongations) per 100 words on three consecutive 100 word conversational samples; (b) individuals in the children's daily environment had to have reported concerns about the child's fluency; and (c) the children had to receive a score of 11 or above on the *Stuttering Severity Instrument-3* (SSI-3; Riley, 1994). On average, the participants presented with eight instances of stuttering per 100 words (range = 3–14.67, SD = 4). The average score across participants on the SSI-3 was 19.7 (range = 11–29, SD = 5.5). See Table 1 for descriptive statistics related to disfluency measures for each participant.

2.3 Procedures

Data collection

If the child met the aforementioned criteria, the parent and child were instructed to complete a conversational interaction in a therapy room. They were told to simply talk to each other 'as they would at home'. Each interaction lasted approximately 15 minutes and was video-taped.

Measures of speech disfluency, utterance complexity and length

The conversational interaction between parents and their children who stutter were transcribed verbatim by an undergraduate and graduate research assistant trained in disfluency and language sample analysis (i.e., the second and third author, respectively). These two authors first individually identified all of the utterances produced by each child. An utterance was defined in the same way it has been for similar previous studies (e.g., Logan 2003; Logan and Conture 1997; Logan and LaSalle 1999; Meyers and Freeman 1985; Yaruss 1999). Specifically, to be considered an utterance it had to be: (a) set apart by pauses; (b) communicate information; and (c) and bound by one intonational contour. Utterances that were abandoned by the child or interrupted by their parent (i.e., incomplete utterances) were transcribed, but were not included in the final data analysis. Any utterances that the second author identified as

Table 1. Participant characteristics

Participant	*Age*	*Gender*	*PPVT-III*	*EVT*	*TSO*	*Partner*	*#Utt*	*#Syl*	*%STG*	*SSI*	*MLU*	*TTR*
1	44	F	114	93	0.5	M/F	80	267	5.5	11	2.95	0.40
2	62	F	109	81	16	M	142	424	10.53	29	2.60	0.38
3	63	M	133	119	18	M	88	395	3	11	4.32	0.46
4	78	M	138	112	54	M/F	95	570	7.7	22	5.65	0.38
5	49	M	113	108	1	M/F	42	157	17	26	3.47	0.47
6	40	F	108	102	4	M	55	180	7	14	3.07	0.53
7	76	M	130	148	40	M	48	496	5	24	9.70	0.36
8	33	M	108	110	6	M/F	54	234	10.3	18	4.14	0.53
9	76	M	104	92	40	M	93	311	7.3	22	2.93	0.42
10	47	M	94	95	3	M	75	323	7.7	19	3.18	0.39
11	28	M	n/a[a]	n/a[a]	5	M/F	53	246	3.6	15	3.84	0.38
12	94	M	115	117	34	M	48	496	9	23	3.49	0.62
13	47	F	102	108	23	M/F	57	229	10	24	3.46	0.43
14	46	M	108	109	19	M/F	67	248	14.67	22	3.42	0.42
15	38	M	102	99	1	M	60	298	3	15	3.87	0.41
M	*57.73*	*n/a*	*112.7*	*106.6*	*17.63*	n/a	*71*	*309*	*8*	*19.7*	*4.01*	*0.44*
SD	*19*	*n/a*	*13*	*16*	*17*	n/a	*25*	*116*	*4*	*5.5*	*1.74*	*0.07*

Note. PPVT-III = Peabody Picture Vocabulary Test – III (standard score); EVT = Expressive Vocabulary Test (standard score); TSO = parent-reported time since initial onset of stuttering (months); M = Mother; M/F = Mother/Father; #Utt = Number of utterances; #Syl = Number of Syllables; % STG = mean frequency of stuttering (percent) per 100 words; SSI-3 = Stuttering Severity Instrument-3 (total score).

[a] Participant 11 was too young to compare to normative data; mean length of utterance (MLU; 3.84), type and token ratio (TTR; 0.38), mean turn length (MLU; 3.74) calculated.

complete and the third author identified as incomplete (N = 11 utterances) were reviewed with the first author and the final identification of the utterance was not made until the authors had 100% agreement. After all of the complete utterances were identified (N = 1064 utterances), the second and third author then separately coded each of the children's utterances for speech disfluency, utterance length, and utterance complexity.

Utterances produced by the participants were coded as stuttered or non-stuttered based on definitions provided by Ambrose and Yairi (1999). Utterances considered to be 'stuttered' were those that contained within word disfluencies (i.e., whole word repetitions, sound/syllable repetitions, audible and inaudible sound prolongations). Utterances that contained between word disfluencies (i.e., phrase revisions, phrase repetitions, tense pauses between words), or did not contain disfluencies, were considered non-stuttered.

Similar to Logan (2003), utterance complexity was defined as mean number of clauses per utterance. Clauses were defined as containing a subject and a verb (Logan 2001, 2003; Logan and Conture 1997). Utterance length was defined as mean number of syllables per utterance as this been the most commonly used measurement when investigating the relationship between length of utterances and speech disfluency in children who stutter (e.g., Brundage and Bernstein-Ratner 1981; Logan 2001; Logan and Conture 1995; Yaruss 1999).

Identification of speech act types

All transcripts were coded at the utterance level using Fey's taxonomy of assertive and responsive speech acts (Fey 1986). The coding process was similar to those described by Logan (2003) and Weiss and Zebrowski (1992). However, since an additional focus of this study was the subtypes that comprise assertive versus responsive acts, coding included identification of whether or not the utterance was considered to be assertive versus responsive and also classification of the specific speech act subtype of each individual utterance. The second and third author each individually categorized each utterance by broad speech act intent (i.e., *assertive* or *responsive*). Each author then coded those utterances as one of the following specific speech act subtype: (1) *comment regarding directly observable events*; (2) *statement about non-observable events or mental evaluations*; (3) *disagreement*; (4) *request for information*; (5) *request for attention*; (6) *request for clarification*; (7) *request for action*; (8) *response to request for information*; (9) *response to request for action*; (10) *response to request for clarification*; (11) *response to request for attention*; and (12) *simple response or acknowledgment of the communication partner's utterances*. The subtype of *response to request for attention* was only produced by five participants whereas each of the other subtypes was produced by each of the

participants. Thus, this particular subtype was excluded from the final data analysis. See Table 2 for the utterance types that fall within each of the two broad speech act categories, specific examples of each speech act subtype, the mean percentage of occurrence of each speech act subtype out of the total subtypes from the transcriptions of the participants in the present study.

Table 2. Speech act classification (Fey, 1986) subtype, example and mean percent of occurrence of each subtype divide by the total number of speech act subtypes produced across the participants

Speech Act Category	Speech Act Subtype	Example	Mean Percent of Occurrence
Assertive	Comments regarding directly observable events	*'There's a lot of stuff in here.'*	15.23%
Assertive	Statements regarding non-observable events or mental evaluations	*'I think he was taking her food.'*	12.80%
Assertive	Disagreement	*'I don't want to play that.'*	5.61%
Assertive	Request for information	*'What's this?'*	9.07%
Assertive	Request for action	*'Put it on your head.'*	4.86%
Assertive	Request for clarification	*'This one?'*	2.80%
Assertive	Request for attention	*'Mommy?'*	7.76%
Responsive	Response to request for information	*'They trying to build something.'*	20.19%
Responsive	Response to request for action	*'I'm just gonna leave it like this.'*	2.90%
Responsive	Responses to request for clarification	*'It has two big wheels.'*	5.51%
Responsive	Responses to request for attention	*'What?'*	0.84%
Responsive	Simple response or acknowledgment of a partner's utterance	*'Yeah.'*	12.43%

2.4 Intrajudge and interjudge measurement reliability

Point by point intrajudge (by the third author) and interjudge reliability (by the second and third author) measures were completed on all of the complete utterances produced by ten randomly selected participants. Reliability measures yielded a 0.98 agreement for fluent versus disfluent utterances, 0.97 agreement for disfluency type (within word vs. between word), and a 0.90 agreement for the speech act subtypes.

3 Results

To review, the purpose of the present study was to extend previous research related to assertive versus responsive speech acts, by, first determining whether or not the previously reported differences between these two types

of communicative intent are moderated by the length and complexity of the utterances. In addition, to date, explorations of assertive versus responsive speech acts as they relate to speech disfluency have been limited to the broad categorization of these two speech act forms. Thus, an additional purpose of this study was to complete a more discrete analysis of the relationship between assertiveness and responsiveness and speech disfluency by investigating potential differences in disfluent speech production across the multiple subtypes of speech acts that comprise these two broad speech act categories.

3.1 Disfluent speech in assertive versus responsive speech acts

To investigate the contribution of length and complexity to the previously reported differences between assertive versus responsive speech acts, the disfluent speech data was first analyzed *without* controlling for these two syntactic variables. In specific, a Mixed Model analysis of variance was completed with mean percent disfluent as the dependent measure, type (i.e., assertive versus responsive) as a fixed factor, and participant as a random effect given the repeated measures aspect of the model. Results were similar to previous research in that assertive utterances were more disfluent than responsive utterances $F(1, 26.60) = 6.86$, $p = 0.014$ (see Figure 1). Also similar to previous research, assertive utterances tended to be longer and more complex (see Figure 2) and, as expected, there were significant correlations between length and percent disfluent ($r = 0.53$, $p < 0.001$) and between complexity and percent disfluent ($r = 0.54$, $p < 0.001$). To confirm the predicted influence of utterance length and complexity on the difference in speech disfluency between these two speech act categories, the Mixed Model analysis described above was completed again, but this time with length and complexity as covariates. Results revealed that when statistically controlling for length and complexity, there was no longer a significant difference in speech disfluency between assertive versus responsive utterances ($p = 0.097$).

It is important to acknowledge that in addition to length and complexity, it is also possible that the age and time since onset (TSO) of the participants may have been related to their disfluent speech production, especially given that with language development, children tend to use longer and more complex utterances (see Zackheim and Conture 2003 for review), become more sophisticated in use of communicative intent (Ninio 1995) and that research has shown that, for some children, the amount of stuttering may steadily increase over time, rather than initially spike and subside (Bloodstein and Bernstein Ratner 2008). However, unlike length and complexity, no significant correlations were found between percent disfluent and TSO ($r = 0.01$, $p = 0.863$), and percent disfluent and age in months ($r = 0.04$, $p = 0.554$). Thus, these two variables were not included as covariates in any of the statistical analyses.

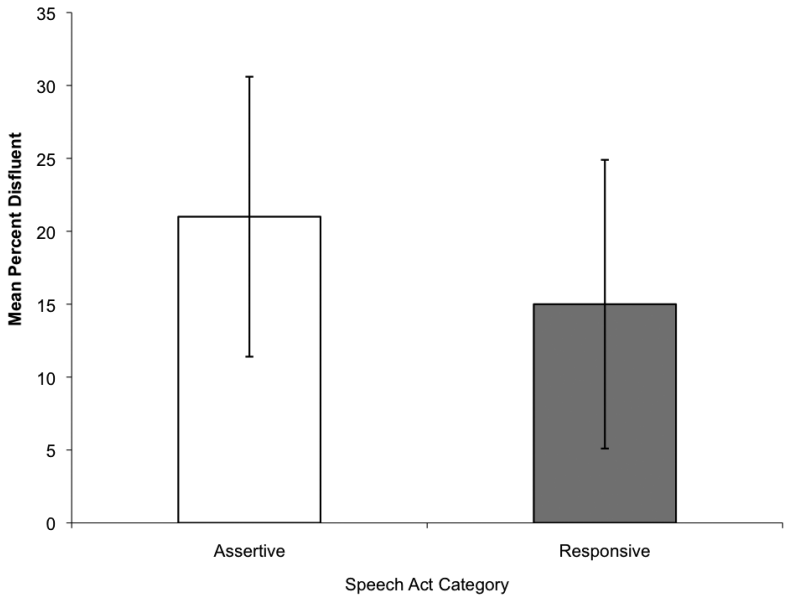

Figure 1. Mean (and standard error) percentage of disfluency in assertive versus responsive speech acts.

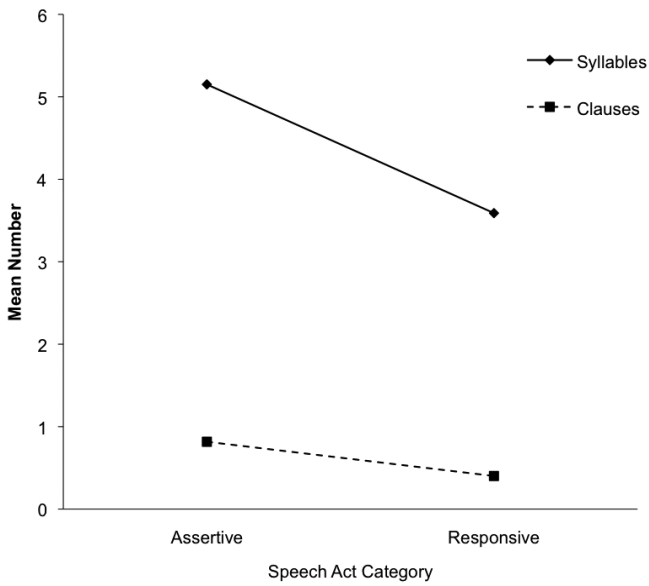

Figure 2. Length (in mean # of syllables) and complexity (in mean # of clauses) of assertive versus responsive speech acts.

3.2 Disfluent speech across the subtypes of assertive versus responsive speech acts

To determine if specific subtypes of speech acts within the wide-ranging assertive and responsive speech act categories potentially contribute to speech disfluency more than other subtypes (again while controlling for length and complexity), a Mixed Model analysis with mean percent disfluent as the dependent measure, subtype as the fixed factor, and length and complexity as covariates was completed. Results revealed a main effect for subtype $F(11, 112.09) = 1.90$, $p = 0.046$, main effect for the covariate of length $F(1, 115.29) = 3.91$, $p = 0.05$, but no main effect for the covariate of complexity, $p = 0.796$. Results further revealed a significant interaction between subtype and complexity $F(10, 113.08) = 1.92$, $p = 0.049$. However, there was not a significant interaction between length and subtype, $p = 0.118$.

An exploration of the interaction between subtype and complexity was completed using: (1) Pearson Product moment correlations of complexity (as measured by number of clauses) and percent disfluent on each of the subtypes; and (2) paired sample *t*-tests. Of the 11 subtypes, only two subtypes yielded strong, significant correlations: (1) *request for action* ($r = 0.69$, $p = 0.009$); and (2) *response to request for clarification* ($r = 0.90$, $p < 0.001$). Pairwise comparisons were also completed to determine if there were some subtypes that were produced with significantly more disfluencies than other subtypes. Results revealed that the subtype of *statement regarding non-observable events or mental evaluations* was produced with significantly more disfluencies than *request for action* ($p = 0.042$), and *response to request for action* ($p = 0.043$). In addition, the subtype of *request for information* was produced significantly more disfluently than *request for action* ($p = 0.012$), *response to request for action* ($p = 0.008$) and *response to request for clarification* ($p = 0.027$). No significant differences were found in mean percent disfluencies for the following subtypes when they were compared individually to each of the assertive and responsive subtypes: (1) *comment regarding directly observable events*; (2) *disagreement*; (3) *request for attention*; (4) *request for clarification*; (5) *simple response or acknowledgment of partner's utterance*; and (6) *response to request for information* (see Figure 3 and Appendix 1).

Post-hoc analyses further revealed that the subtype of *statement regarding non-observable events or mental evaluations* had significantly more clauses than the subtype of *response to request for action* $t(24) = 4.80$, $p < 0.001$, but that this speech act subtype did not differ in complexity from the other subtype for which it was more disfluent (i.e., *request for action*). Results also revealed that the subtype of *request for information* had a significantly higher mean number of clauses than the subtype of *response to request for action* $t(23) = 2.36$, $p = 0.027$, but did not significantly differ in mean clause amount from the

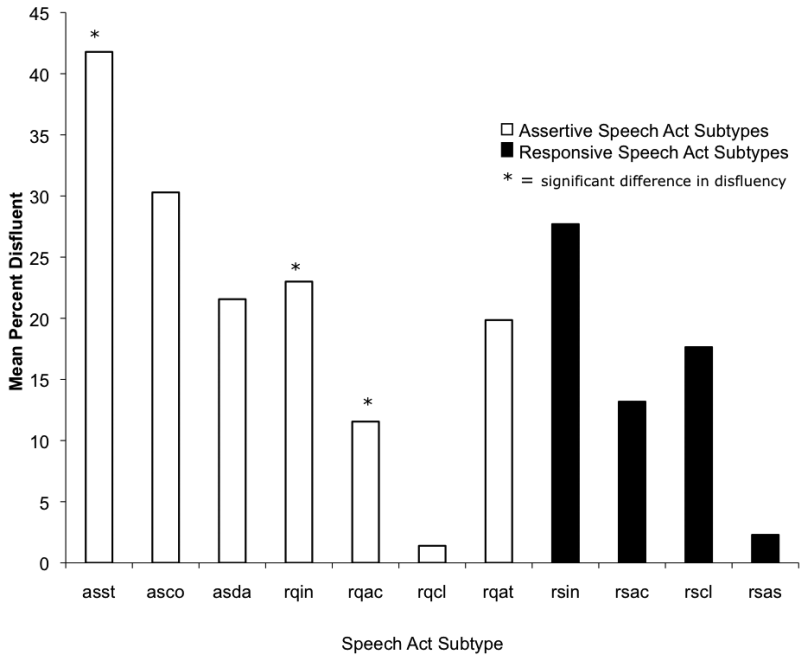

Figure 3. Mean percent disfluent for assertive (i.e, request for information [RQIN]; request for action [RQAC]; request for clarification [RQCL]; request for action [RQAC]; comment regarding an observable event [ASCO]; statement regarding a non-observable event or mental evaluation [ASST]; disagreement [ASDA] and responsive speech act subtypes (i.e., response to request for information [RSIN]; response to request for action, [RSAC]; response to request for clarification [RSCL]; simple response or acknowledgment of partner's utterance [RSAS]).

subtypes of *request for action* or *response to request for clarification* for which it was more disfluent (see Figure 4). These findings indicate that the subtype of *statement regarding non-observable events or mental evaluations* only differs in disfluency from the subtype of *response to request for action* because those types of statements tend to be more syntactically complex than those types of responses. By comparison, the subtype of *statement regarding non-observable events or mental evaluations* was more disfluent than the *request for action* subtype, but was not more complex, suggesting that the difference in disfluency between these two speech act subtypes is more closely related to the differences in the underlying communicative intent. Similarly, the subtype of *request for information* was more complex and more disfluent than the subtype of *response to requests for action* indicating the complexity of the utterance compromised the difference noted in the disfluency. However, the *request for*

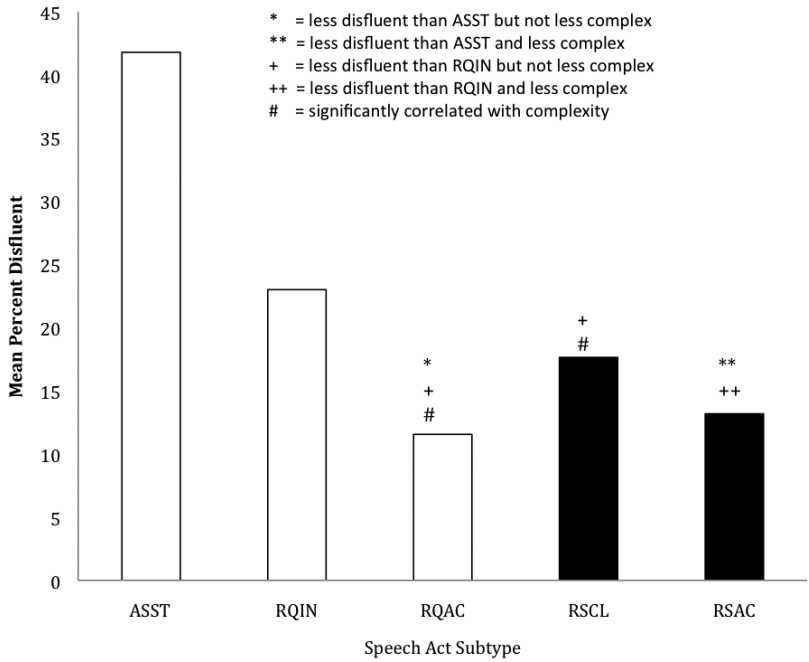

Figure 4. Specific speech act subtypes that differed in mean percent disfluency and/or complexity (i.e., statement regarding a non-observable event or mental evaluation [ASST], request for information [RQIN], request for action [RQAC], response to request for clarification [RSCL]; response to request for action, [RSAC]).

information subtype was not more complex, but was more disfluent than the subtypes of *request for action* and *response to requests for clarification*. Taken together, these findings suggest that the differences in disfluent speech when producing some speech act subtypes are moderated by differences in complexity whereas for other subtypes the differences in speech disfluency are moderated by differences in communicative intent.

4 Discussion

Findings from the present study further confirm the assumption that when grouping speech acts into the broad categories of assertive versus responsive, it is the length and complexity, rather than the communicative intent of the utterance that contributes to disfluent speech production. However, findings further reveal that when considering the individual subtypes that comprise the assertive and responsive speech act categories, there are specific speech act

subtypes that do not differ in the number of clauses, but do differ in amount of speech disfluency suggesting that, for some speech act subtypes, the communicative intent of the utterance does contribute, at least, in part, to difficulties maintaining speech fluency.

4.1 Disfluent speech in assertive versus responsive speech acts

Assertive speech acts tend to be longer and more complex than responsive speech acts; thus, when grouping utterances into these broad categories, the number of words and clauses that comprise the utterances seems to account for the majority of the variability in the disfluencies produced. This result supports previous research findings on length and grammatical complexity in CWS (e.g., Bernstein-Ratner and Sih 1987; Gaines *et al.* 1991; Logan and Conture 1995; Yaruss 1999; Zackheim and Conture 2003). It also emphasizes the notion that the development of communicative intent is correlated with the development of syntactic structures (Yont *et al.* 2003). Given that stuttering has been shown to be vulnerable to syntactic complexity (e.g., Anderson and Conture 2000; Conture 2001; Gordon *et al.* 1986; Logan and Conture 1997; Logan and LaSalle 1999; Silverman and Bernstein-Ratner 1997), it is not surprising to see that those forms of intent that are longer in words and also contain more clauses are those that tend be produced disfluently.

In addition to the syntactic structure, communicative intent can vary in terms of level of communicative demand placed on the speaker (e.g., responsive acts place less formulative demand on the speaker than assertive acts). Thus, speech disfluency may vary depending on the specific type of communicative intent or rather the level of communicative responsibility placed on the speaker when producing that particular speech act form. A more discrete analysis of speech fluency across the specific subtypes of speech acts that comprise the broad categories of assertive and responsive speech acts was completed to help to disambiguate the influence of communicative intent on disfluent speech production.

4.2 Disfluent speech across the subtypes of assertive versus responsive speech acts

Similar to the broad categories of assertive and responsive, there appears to be a relationship between the number of words and also the number of clauses that comprise the utterance and the production of disfluent speech for the speech act subtypes. In specific, there was a main effect for length indicating that, across all subtypes, speech disfluency increased when the length of the utterance increased. By comparison, the relationship between number of clauses and disfluent speech production differed across subtypes. The fluent production of the speech act subtypes of *request for action* and *response to*

request for clarification appeared to be uniquely vulnerable to complexity in that as the number of clauses increased, the production of disfluencies increased. Thus, for these two subtypes, the intention of the utterance does not appear to contribute to the difficulties maintaining speech fluency.

However, there were also significant differences in disfluent speech production between some of the subtypes that did not differ from each other in the mean number of clauses produced. *Statements regarding non-observable events or mental evaluations* were significantly more disfluent, but not more complex than *requests for action*. Similarly, *requests for information* were more disfluent, but were not significantly more complex than *responses to request for action*, or *responses to requests for clarification*. These findings suggest that the communicative intent of these utterance subtypes may be a larger contributor to speech disfluency than the clausal complexity of the utterance. Perhaps, the inherent nature of these speech act subtypes necessitates greater linguistic demands independent of complexity.

Communicative responsibility as discussed more recently by Weiss and Zebrowski (1992) in their exploration of communicative intent, and others in the past (e.g., Eisenson and Horowitz 1945; Eisenson and Wells 1942; Stocker 1980; Stocker and Gerstman 1983; Stocker and Usprich 1976) refers to the novelty of the information the speaker is trying to communicate to the listener. When an utterance is based on a previously established topic or rather has a shared referent, it is assumed to require less communicative responsibility on the speaker. By comparison, utterances that are considered to have a higher level of communicative responsibility are those in which the context is not known to the listener. Differences noted in the disfluent speech production between certain speech act subtypes may be related to differences in communicative demands placed on the speaker when producing those acts.

For example, the production of the speech act subtypes of *statement regarding non-observable events or mental evaluations* and *requests for information* requires the speaker to provide novel information of unshared referents to the listener. Therefore, regardless of the number of clauses, the communicative responsibility of these two subtypes remains high given that the context has not yet been established with the listener. As a result, these types of acts appear to be more vulnerable to speech disfluency. Conversely, *requests for action* and *responses to requests for clarification* are speech acts that have shared referents and require minimal to no generation of novel information. When producing *responses to requests for clarification* (established information) the child can repeat utterances, repeat and expand utterances, or simply say 'yes' or 'no'. Thus, in contrast to *statements regarding non-observable event or mental evaluations* and *requests for information*, for these subtype productions, the communicative responsibility is low. Perhaps, communicative responsibility

as defined by the speech act subtype produced should be considered when analyzing and/or facilitating the speech fluency of children who stutter.

4.3 Frequency considerations

It is important to note that these data are based on spontaneous speech and language samples, thus, the production of each speech act subtype was not equal across participants. For example, the mean percentage of occurrence of the assertive speech act subtype of *statement regarding non-observable events or mental evaluations* was 12.80% as compared to the *requests for action* subtype which comprised 4.86% of the subtypes produced. For this reason, one could argue that the increased production of disfluent speech on certain subtypes may be because those subtypes were produced more frequently allowing for increased opportunity to stutter on those act types. However, there were other subtypes that were produced to a lesser degree than certain subtypes, but were produced more disfluently. For example, the mean percent of occurrence of the speech act subtype *requests for information* was 9.07% and this particular subtype tended to be produced more disfluently than the subtype of *response to request for information* despite the fact that the mean percentage of occurrence of *response to request for information* was 20.19%. These findings suggest the frequency of occurrence whether it is to a lesser degree or to a greater degree cannot account for the differences in disfluent speech production.

4.4 Clinical implications

As has been shown across several studies (see Bloodstein and Bernstein-Ratner 2008; and Zackheim and Conture 2003 for review), and corroborated in the present one, clinicians should continue to take into account the syntactic nature of the utterance being produced by their clients who stutter, as stuttering will likely increase on utterances that are longer and more complex. Findings further suggest that clinicians should consider exploring the communicative intent of the utterances produced and whether or not their clients are more susceptible to disfluent speech when producing certain speech act subtypes. Assertive and responsive utterance subtypes that are more likely to be produced fluently (i.e., those that place the lowest amount of communicative responsibility on the speaker) could be modeled first to allow for predicted ease in fluent speech production. Clinicians could then gradually model and elicit those assertive and responsive speech act subtypes that are more likely to be produced disfluently by their client. However, these clinical suggestions should be interpreted with caution given to the exploratory nature of this study. Additional research is needed to determine the clinical benefit, if any (Ryan 2006; cf. Weiss 2004), of using pragmatic based strategies such as assertive/responsive speech act modeling in therapy.

5 Conclusion

In summary, findings confirm that length and complexity of utterances as measured by number of words and clauses significantly compromise speech fluency across varying forms of communicative intent. Findings also indicate that speech fluency may fluctuate relative to the speech act subtypes produced. Thus, in addition to length and complexity, clinicians should take into account the specific communicative intentions of their client's productions and their client's ability to maintain fluency during those productions, particularly relative to those intentions that require a higher level of communicative responsibility.

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Note

1. $$Corrected\ Percent\ Value = number\ disfluent\ x\ utterances * \left(\frac{total\ number\ utterances\ for\ speech\ act\ type}{total\ number\ x\ \ utterances}\right)$$

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Appendix 1: Results by utterance type (%)

Age	ASST	ASCO	ASDA	RQIN	RQAC	RQCL	RQAT	RSIN	RSAC	RSCL	RSAT	RSAS
2;4	11%	16%	4%	11%	6%	8%	12%	19%	2%	0%	2%	9%
2;9	9%	12%	7%	7%	5%	5%	5%	10%	5%	14%	0%	23%
3;2	13%	20%	5%	8%	13%	2%	2%	6%	3%	17%	0%	10%
3;4	10%	17%	4%	7%	9%	2%	13%	13%	2%	5%	0%	18%
3;8	12%	19%	12%	7%	4%	5%	7%	11%	8%	6%	0%	8%
3;10	12%	12%	3%	12%	6%	7%	6%	23%	9%	6%	0%	6%
3;11	17%	18%	10%	10%	2%	4%	6%	12%	3%	10%	0%	6%
3;11	10%	11%	9%	14%	10%	3%	7%	16%	2%	8%	0%	10%
4;1	10%	14%	8%	8%	6%	4%	22%	10%	2%	4%	2%	10%
5;2	8%	18%	5%	6%	5%	4%	10%	16%	8%	5%	2%	13%
5;3	16%	6%	2%	11%	8%	10%	6%	22%	2%	3%	0%	14%
6;4	15%	12%	2%	6%	8%	6%	10%	26%	4%	2%	0%	8%
6;4	9%	15%	5%	9%	4%	8%	16%	13%	2%	5%	2%	12%
6;6	14%	12%	6%	10%	2%	6%	10%	10%	6%	9%	1%	14%
7;10	9%	13%	7%	10%	10%	2%	3%	23%	2%	7%	2%	13%

*RSAT was not included in the final data corpus as there were nine children who did not produce that speech act type.