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Spontaneous Regulation of Emotions in Preschool Children Who Stutter: Preliminary Findings

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Abstract

Purpose—Emotional regulation of preschool children who do (CWS) and do not stutter (CWNS) was assessed using a disappointing gift (DG) procedure (Cole, 1986; Saarni, 1984, 1992).

Method—Participants consisted of 16 3- to 5-year-old CWS and CWNS (11 boys and 5 girls in each talker group). After assessing each child's knowledge of display rules about socially-appropriate expression of emotions, children participated in a DG procedure and received a desirable gift preceding a free-play task and a disappointing gift preceding a second free-play task. Dependent variables consisted of participants' positive and negative expressive nonverbal behaviors exhibited *during* receipt of a desirable gift and disappointing gift, as well as conversational speech disfluencies exhibited following receipt of each gift.

Results—Findings indicated that CWS and CWNS exhibited no significant differences in amount of positive emotional expressions after receiving the desired gift; however, CWS, when compared to CWNS, exhibited more negative emotional expressions after receiving the undesirable gift. Furthermore, CWS were more disfluent after receiving the desired gift when compared to receiving the disappointing gift. Ancillary findings also indicated that CWS and CWNS had equivalent knowledge of display rules.

Conclusion—Findings suggest that efforts to concurrently regulate emotional behaviors and (non)stutterings may be problematic for preschool-age CWS.

Recent investigations of possible causal links to developmental stuttering have often focused on the contributions of speech-language (e.g., Anderson & Conture, 2000, 2004; Au-Yeung, 1998; Conture, Zackheim, Anderson, & Pellowski, 2004; Hartfield & Conture, 2006; Logan & Conture, 1997; Louko, Edwards, & Conture, 1990; Ryan, 1992) and motor abilities (e.g., Denny & Smith, 2000; Peters, Hulstijn, & Van Lieshout, 2000; van Lieshout, Hulstijn, & Peters, 1996; Smith & Kleinow, 2000). Fewer, however, have empirically explored the potential influence of psychological variables on developmental stuttering in individuals who stutter (e.g., Alm, 2004; Baumgartner & Brutten, 1983; Craig, 1990; Craig, Hancock, Tran, & Craig, 2003; Craig & Tran, 2006; Weber & Smith, 1990).

In an attempt to account for childhood stuttering as it relates to both speech-language planning/production and emotional variables, one recent theoretical account of childhood stuttering – the Communication Emotional (CE) Model of Stuttering – includes components of emotional development as part of a causal chain of variables that influence. In general, the CE model attempts to account for childhood stuttering as it relates to both speech-language planning/production and emotional variables (Conture et al., 2006). Specifically,

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the CE model suggests that proximal contributors (e.g., speech and language planning and production) are exacerbated or modulated by other factors like emotion reactivity and regulation. Although the CE Model does not suggest that emotion reactivity and regulation "cause" developmental stuttering, it does suggest that the quantity, quality and efficiency of emotional regulation may impact instances of stuttering (Conture et al., 2006).

Based on this theoretical model, therefore, the present authors speculate that stuttering could be influenced, at least for some children who stutter, when strong emotional reactions are coupled with relatively weaker abilities to regulate or modulate these strong emotional reactions. We further speculate that children who stutter may experience a strong reaction to or low regulation of instances of stuttering in everyday speaking situations. It is not clear, however, whether these differences in emotion reactivity and regulation impact stuttering-like disfluencies, normal/nonstuttering-like disfluencies, both or neither.

At present, there is a relative paucity of empirical evidence to support these theoretical speculations linking emotion reactivity and regulation to disfluent speech (stuttering-like or normal/nonstuttering-like disfluencies). There is, however, some empirical evidence suggesting between-group differences in emotional development between children who stutter (CWS) and children who do not stutter (CWNS) with regard to temperament, a psychological construct that relates to emotion reactivity and emotion regulation (for further discussion, see Thomas & Chess, 1977). For example, some findings suggest that aspects of CWS' temperament are significantly different from that of CWNS (Anderson, Pellowski, Conture & Kelly, 2003; Embrechts et al., 2000; Wakaba, Iizawa, Gondo, Inoue, & Fujino, 1998; cf., Lewis & Goldberg, 1997; Williams, 2006).

Others have explored beyond the overall construct of temperament by studying specific aspects of emotional development of preschool-age CWS. For example, an early study by Glasner (1949) reported atypical emotional differences in preschoolers who stutter. More recently, Vanryckeghem et al. (2001) explored the emotional reactions and mal-attitude of young CWS to their stuttering severity and reported positive correlations between these three factors.

Additional empirical findings (e.g., Karrass et al., 2006; Schwenk, Conture, & Walden, 2006), as well as clinical observations (e.g., Kado & LaSalle, 2000; LaSalle, 1999), appear to suggest that one aspect of emotional development – emotion regulation – may be problematic for CWS. Specifically, young CWS, when compared to their CWNS peers, have been shown to exhibit some difficulty in adapting to novelty and self-regulating emotional responses (Karrass et al., 2006; Schwenk, et al., 2006).

Emotion regulation can be defined as strategies that allow for intentional modulation of internal emotion and behavioral expression or reaction (Eisenberg et al., 2000). It is thought that successful emotion regulation permits an individual to adequately regulate most, if not all aspects of emotion, including expressive behavior (Cole, Zahn Waxler, & Smith, 1994; Liew, Eisenberg, & Reiser, 2004; Matsumoto, Yoo, Hirayama, & Petrova, 2005; Thompson, 1994). For young children, episodes of socialization are known to help them develop appropriate or typical use of emotion regulation and, more specifically, their ability to control public display of emotions (Kieras, Tobin, Graziano, & Rothbart, 2005). However, highly reactive children may have more difficulty developing the ability to display socially appropriate emotional expression and, as a result, have problems developing appropriate use of emotion regulation (Kieras et al., 2005). Although not synonymous, the construct of emotion regulation is closely related to other emotion-related constructs such as emotion reactivity, behavioral inhibitions or hypersensitivity (for further discussion, see Cole, Martin & Dennis, 2004).

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As mentioned above, there is no empirical evidence suggesting a direct link between inefficient emotion regulation and the actual instances of stuttering-like and nonstuttering-like disfluencies. If, however, empirical evidence was found that directly linked emotion regulation to instances of stuttered and/or (non)stuttering-like disfluencies, such findings might suggest that emotion regulation has some causal or modulating influence on developmental stuttering in young preschool-age children. For example, at least some preschool-age CWS may be more apt to exhibit strong reactions to environmental changes (e.g., entering therapy room for the first time) and/or (a)typical changes in their speech-language planning and production (e.g., suddenly being "stuck" when initiating an utterance). Such speculation, however, must await empirical evidence for support or refutation.

One concern with previous studies in this area is that their findings were often based on parent- or self-report (e.g., Anderson et al., 2003; Craig et al., 2003; Embrechts, Ebben, Franke, & Van de Poel, 2000; Karrass et al., 2006; Vanryckeghem et al., 2001; cf. Lewis & Goldberg, 1997; Williams, 2006). In contrast, there fewer findings have been based on behavioral observation (for exceptions, see Bush, 2006; Schwenk et al., 2006). Thus, there would appear to be some need for more direct behavioral observations of children's emotional and related behaviors, particularly in reference to stuttering.

In the field of developmental psychology, various procedures have been developed to permit empirical study of emotion regulation in children. One such experimental procedure, the *Disappointing Gift* (DG) procedure (Saarni, 1984), is appealing in that it provides insight into an individual's ability to regulate his or her negative emotions and expressive behavior in social contexts or during conversational speech (McDowell, O'Neil, & Parke, 2000). The DG procedure is commonly used in studies of emotional development with at least 70 published studies between 1998 and 2008 referencing the procedure (e.g., Aldrich & Tenenbaum, 2006; Brody, 2000; Broomfield, Robinson, & Robinson, 2002; Garrett Peters & Fox, 2007; Herot, 2002; Parke et al., 1998; Ramsden & Hubbard, 2002).

Specifically, during the DG procedure, the participant completes a task and receives a toy that was a priori self-selected as being "really cool" (the desirable gift). The participant then completes a second task and receives a different toy a priori self-selected as being "really yucky" (the disappointing gift). Video recordings are taken of the participant completing each task and receiving each gift and completing each task. Dependent measures are based on behavioral coding of the participant's (non)verbal expressive behavior when receiving each gift in the presence of the gift giver. Empirical findings based on use of the DG procedure indicate that preschool-age children as young as three-years of age can effectively regulate spontaneous expressive behavior in this situation (see Cole, 1986).

Typically, the DG procedure is used to assess children's socially appropriate *use* of "display rules," that is, behaviors thought to reflect emotional regulation in children (i.e., the minimization of the child's true emotional response combined with the production of the socially expected emotional response). *Display rules (DR)* are defined as appropriately expressing positive emotional behaviors while simultaneously suppressing negative emotional behaviors in a social context. One example of a DR would be a child expressing a pleasurable appearance and reaction to receipt of an undesirable or disappointing gift (for further discussion, see Banerjee & Yuill, 1999; Diefendorff & Richard, 2003; Gnepp & Hess, 1986; Kieras et al., 2005). Thus, knowing that a child's performance in a DG procedure not only reflects their socialized *use* but also their basic *knowledge* of display rules (KDR), it is also important – when employing the DG procedure – to measure a young participants' actual knowledge and understanding of display rules. To address this challenge to the DG procedure, researchers have measured KDR in preschool-age children separately

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from the DG procedure to determine whether preschoolers understand *when* and *why* display rules are used (Banerjee, 1997; Banerjee & Yuill, 1999; Gnepp & Hess, 1986; Jones, Abbey, & Cumberland, 1998; Josephs, 1994; Matsumoto et al., 2005).

Given the aforementioned possibility that emotion regulation may be related to childhood stuttering – encompassing stuttering-like disfluencies, nonstuttering-like disfluencies or both – it was the purpose of the present study to assess emotional regulation in preschool-age children who do and do not stutter in a social context (with gift giver present) using a *disappointing gift* procedure. In addition, present investigators attempted to examine the relation, if any, between these emotional processes and associated stuttering-like speech disfluencies (SLD) and nonstuttering-like disfluencies (nSLD).

It was hypothesized that (1) after receiving a desirable gift, CWS would display more positive expressive behavior than CWNS and (2) after receiving a disappointing gift, CWS would display more negative expressive behavior than CWNS. These hypotheses were based, at least in part, on previous findings (Karrass et al., 2006) indicating that CWS tend to be more emotionally reactive and less well-regulated in comparison to CWNS. It was further hypothesized that (3) CWS and CWNS would display more (non)stutterings per 100 words during a conversational task following receipt of a disappointing gift compared to receipt of a desirable gift. This hypothesis is based on speculation that at least some preschool-age children may exhibit minimally regulated high reactivity which might make it difficult for them initiate and/or maintain normally fluent speech-language planning and production (e.g., Karrass et al., 2006).

Knowledge of Display Rules (KDR) was also measured to control for possible effects of differential knowledge of display rules among the participants. Therefore, prior to the DG procedure, KDR was assessed using prosocial display rule vignettes. Given the assumption that both CWS and CWNS learned or knew about DR to the same degree, the authors did not expect any between-group difference in KDR. Furthermore, given that *use* of DR develops prior to actual *knowledge* in young preschool children the authors also did not expect to find a significant correlation between regulation of emotions during the DG procedure and measured KDR (Banerjee, 1997; Banerjee & Yuill, 1999; Jones et al., 1998).

Method

Participants

Participants consisted of 16 preschool-age children who stutter (CWS) and 16 preschool-age children who do not stutter (CWNS), all of whom were native speakers of American English. All participants were involved in a series of empirical studies through the Vanderbilt University Developmental Stuttering Research Project.

Participants were between the ages of 3;0 (36 months) and 5;9 (69 months) (CWS: M = 46.69 months, SD = 8.55; CWNS: M = 48.44 months, SD = 8.89) with no statistically significant group difference in chronological age, t (30) = -.57, p = .58. Each talker group (CWS/ CWNS) consisted of 11 boys and 5 girls. All participants were paid volunteers referred to the Vanderbilt Bill Wilkerson Center by their parents, speech-language pathologists, daycare, preschool, or school personnel. None of the 32 children had previously received or were receiving formal/structured intervention for stuttering or any other communication disorder. In addition, participants had no known or reported hearing, neurological, developmental, academic, intellectual, or emotional problems. This study protocol was approved by the Institutional Review Board of Vanderbilt University, Nashville, Tennessee. For each of the 32 participants, parents signed an informed consent, and children assented.

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Excluded participants—From an initial group of 22 CWS, 4 participants were excluded because of incomplete data due to technical difficulties during the experimental procedure, 1 because of noncompliant behavior during the experimental procedure, and 1 because of evidence of a behavioral problem indicated on a parent–report questionnaire. Thus, 16 CWS were included in the final sample. From an initial group of 27 CWNS, 9 participants were excluded because of incomplete data due to technical difficulties during the experimental procedure, 1 participant because of noncompliant behavior during the experimental procedure, and 1 because of a parent reported behavioral problem. Thus, 16 CWNS were included in the final sample.

Classification

Children who stutter (CWS)—A child was considered a CWS if he or she (a) exhibited three or more stuttering-like disfluencies (SLD; i.e., sound/syllable repetitions, whole-word repetitions, audible sound prolongations, inaudible sound prolongations) per 100 words of conversational speech (based on a 300-word sample; Bloodstein, 1995; Conture, 2001b; Yairi & Ambrose, 1992) and (b) received a total score of 11 or above (a severity equivalent of at least “mild”) on the Stuttering Severity Instrument-3 (SSI-3; Riley, 1994; CWS had a mean score of 16.69, SD = 4.19).

Children who do not stutter (CWNS)—A child was considered a CWNS if he or she (a) exhibited two or fewer SLD per 100 words of conversational speech (based on a 300-word sample) and (b) received a total score of 10 or less (a severity equivalent of less than “mild”) on the SSI-3 (CWNS had a mean score of 6.44, SD = 2.50).

Standardized Speech-Language Tests and Hearing Screening—To participate in this study, all participants scored at the 16th percentile or higher (approximately 1 standard deviation below the mean) on the (a) *Peabody Picture Vocabulary Test- Third Edition* (PPVT-IIIA or B; Dunn & Dunn, 1997), (b) *Expressive Vocabulary Test* (EVT; Williams, 1997), (c) *Test of Early Language Development-3* (TELD-3; Hresko, Reid, & Hamill, 1999) and (d) the “Sounds in Words” subtest of the *Goldman-Fristoe Test of Articulation-2* (GFTA-2; Goldman & Fristoe, 2000), standardized tests used to assess receptive and expressive vocabulary, receptive and expressive language skills, and articulation abilities, respectively. The one SD criterion is commonly used to identify children with clinically-significant language impairment (e.g., Fujiki, Spackman, Brinton, & Hall, 2004). Furthermore, each participant passed a bilateral pure tone hearing and tympanometric screening (ASHA, 1990). These tests were administered to each child during a visit to the Vanderbilt Bill Wilkerson Center approximately 1–2 weeks before experimental testing (i.e., participation in the DG procedure).

Race—The child’s race was ascertained by parental interview. There were 16 Caucasian and 1 biracial participant in the CWS group; there were 15 Caucasian and 1 African-American participant in the CWNS group.

Socioeconomic Status (SES)—Each participant’s SES was determined through application of the Four Factor Index of Social Position (Hollingshead, 1975), based on maternal and paternal occupation and educational levels for each participant. Scores ranged from 8 to 66; a higher score suggests higher SES. There was no statistically significant difference in SES between CWS (M = 41.62, SD = 7.56) and CWNS (M = 42.50, SD = 10.20), t (30) = -.28, p = .78.

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Procedures

Participants and their parents (predominantly mothers) visited the university laboratory twice; the second visit was 1–2 weeks after the first. The first visit involved speech, language and temperament assessments, a hearing screening, and the KDR assessment (described immediately below). The DG procedure was conducted during the second visit, along with a storytelling activity and parent-child book reading, which are not part of the present study. Each of the two visits lasted approximately 1.5 hours. Parents received information about their children's performance on the speech, language, and temperament assessments at the end of each visit.

Knowledge of Display Rules Task (KDR)—Each child participated in a *KDR task*, which was completed by a trained experimenter following the screenings of speech, language, temperament, and hearing. Similar to Banerjee and Yuill (1999) as well as others (i.e., Banerjee, 1997; Gnepp & Hess, 1986; Jones et al., 1998), each child listened to four stories each illustrated by three (of four total) sequential, related pictures. After listening to a portion of the story, the experimenter asked the participant to identify the actual emotion of the main character (i.e., whether or not the character felt happy or sad on the inside) by pointing to either a happy emoticon (i.e.,☺) or a sad emoticon (i.e.,☹) picture. The experimenter then presented a fourth sequential picture, which showed the main character with a missing face and continued with the story by informing the participant that the motive of the story was to avoid making the secondary character "feel bad" and not hurt their feelings. The experimenter then asked the participant to identify what the main character's facial expression should look like (i.e., whether the character should display a happy or sad face on the outside in order to avoid hurting the secondary character's feelings). After responding, the participant was asked to explain the 'facial expression' he or she selected, as well as indicate how the secondary character felt about the main character's facial expression (i.e., does the secondary character think the main character is sad or not sad?; see Appendix A for an example of a prosocial event vignette example).

Disappointing Gift (DG) Task: General—Table 1 provides an outline of this study's DG Task design. One to two weeks following the initial on-campus pre-screening visit (at the end of which they completed the KDR task), each child participated in two experimental conditions (i.e., Desirable Gift; Disappointing Gift) interspersed between three free-play conversations (Baseline Conversation; Desirable Gift Conversation; Disappointing Gift Conversation) during a second 60- to 90-minute session as part of a larger study.

To begin, the child selected two desirable ("really cool") gifts and one disappointing ("really yucky") gift. The selection of gifts included in the present study (see Appendix B) was based on gifts used in previous studies employing the DG task (Cole, 1986; Davis, 1995; Saarni, 1984). At the conclusion of each conversation, a gift was presented as a reward for cleaning up the toys used in the previous conversation, but more importantly, as a potential influence on speech disfluencies on the subsequent conversation.

The three free-play parent-child conversations included three age-appropriate toy themes (i.e., cars, farm animals, legos). The toys were presented in counterbalanced order to ensure that each participant had the same selection of items for each of the three free-play conversational tasks. Statistical analysis of the randomized order of the three toy themes confirmed that, for both CWS and CWNS, the order in which the toy themes were presented was not significantly different from an equal distribution of the three toy themes: (1) cars: $\chi^2(2, N = 32) = .79$, $p = .68$; (2) farm animals: $\chi^2(2, N = 32) = .83$, $p = .66$; (3) legos $\chi^2(2, N = 32) = 2.29$, $p = .32$.

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Neither child nor parent was informed of the objectives of this study until the conclusion of all three conversational tasks. Each of the three conversational tasks (Baseline Conversation, Desirable Gift Conversation, and Disappointing Gift Conversation) and the child's nonverbal behaviors during the two gift conditions (Desirable Gift Condition and Disappointing Gift Condition) were audio-video recorded for subsequent offline analyses.

Disappointing Gift Procedure: Specific Sequence

In the typical DG paradigm, the desired gift choice, as a reward for completing a task, is always presented *before* presenting the disappointing gift choice as a reward for completing a second task (e.g., Cole, 1986; Davis, 1995; Saarni, 1984). This sequence is structured to build the participant's motivation from receiving the initial desired gift to anticipation of the next gift, which, unexpectedly, is less desired. Again, Table 1 shows the general content and sequence of the baseline task, desirable gift condition and task, and the disappointing gift condition and task. During each visit, both gift conditions were randomly conducted (or presented) by the same experimenter – either the first author or another experimenter trained in the experimental task. In other words, during a given visit, one experimenter was designated to present both the desirable gift and the disappointing gift.

Baseline Conversation—Each child participated in a 5-minute free-play conversation with his or her parent using one of the three toy themes. The purpose of this baseline conversation was to provide an opportunity to reward the participant for cleaning up afterwards. Also, a disfluency count of the participant's first 100 words was gathered to provide baseline data regarding speech disfluency (i.e., frequency of stuttered and/or non-stuttered disfluencies).

Desirable Gift Condition—After the Baseline Conversation, the parent was asked to leave the room while the child remained seated on the floor of the playroom perpendicular to the experimenter. The participant was then presented with a gift box containing his/her first choice desirable gift. Both the participant and the experimenter were seated in direct view of two separate video cameras (see Appendix B for examiner script of gift presentation). One camera recorded the facial/bodily expressions of the child and the other that of the experimenter (with the two images simultaneously recorded into a time-locked split-screen image). Once the participant opened the box, the experimenter maintained a neutral facial expression and eye contact with the participant for 20 seconds.

Desirable Gift Conversation—After receiving the desirable gift, each child participated in a second 5-minute free-play conversation with his or her parent using one of the three toy collections. During the Desirable Gift Conversation, a second disfluency count of the participant's first 100 words was gathered to assess what effects, if any, receiving a *desired* gift prior to this conversation had on the child's speech disfluency (i.e., frequency of stuttered and/or non-stuttered disfluencies).

Disappointing Gift Condition—Upon completion of the second conversational task *(Desirable Gift Conversation)*, the parent was again asked to leave the room while the child remained seated on the floor of the playroom perpendicular to the experimenter. The participant was then presented with a gift box containing their disappointing gift choice. Both the participant and the experimenter were seated in direct view of the two video cameras. Once the participant opened the box, the experimenter maintained a neutral facial expression and maintained eye contact with the participant for 20 seconds.

Disappointing Gift Conversation—After receiving the disappointing gift, each participant participated in a third 5-minute free-play conversation with his or her parent

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using the last of the three toy themes. Again, a disfluency count of the participant's first 100 words was gathered to assess what effects, if any, receiving a disappointing gift prior to this conversation had on speech disfluency (i.e., frequency of stuttered and/or non-stuttered disfluencies).

Upon completion of the entire experimental session, the child was presented with his *second choice desirable gift* before continuing with the remainder of the visit, to ensure any negative effects of having received the disappointing gift were minimized.

Coding/Scoring Procedures

Knowledge of Display Rules—Responses to prosocial vignettes were scored offline similar to the format used by Banerjee and Yuill (1999). Each child received up to four points per vignette (4 points × 4 vignettes = 16 total possible points) for responding appropriately to a series of questions relating to each vignette (see Appendix A for scoring system).

Disappointing Gift—Observations of the child's expressive nonverbal behaviors were coded off-line by the first author - who was privy to each participant's talker group classification - using audio-video recordings of the child's performance during the DG procedure. This was performed in accordance with an adapted version of a coding system developed by Saarni (1984; 1992), whose empirical investigation was one of the first empirical studies employing the DG task.

This nonverbal behavioral coding system, used to study elementary school-age children, was created to be: (1) reliable, (2) easily categorized in terms of children's facial expressions (including additional non-facial behaviors), and (3) to permit assessment of (non)use eye-region facial behavior (Saarni, 1984). Saarni's coding system was based largely on work by Ekman and Friesen (Ekman, Friesen, & Hager, 1978; for an extensive discussion on the Saarni coding system, see Saarni, 1984; 1992). Saarni's system has been shown to be reliable (Saarni, 1984; 1992) and has been used in adapted forms by other classic studies using DG methodology (Davis, 1995).

Originally, similar coding schemes used with the DG paradigm often included observable nonverbal behaviors relating to facial expressions, vocalizations, gazing and body movement categorized as positive, negative, or transitional dimensions (Davis, 1995; Saarni, 1984; 1992). However, given the novelty of the present study to the area of stuttering and a clear contrast between the positive dimension and negative dimension, the transitional category was not used in the present study. Furthermore, eye-related nonspeech expressions have been shown to be significantly related to instances of stuttering exhibited by preschool-age children who stutter (Conture & Kelly, 1991). Thus, all eye-related (e.g., eyeball movement to the side) expressive behaviors were removed from the present data analysis. The *positive* and *negative* dimension referred to four behaviors each, which included explicit aspects of positive emotional expression and negative emotional expression, respectively (see note in Table 1).

Expressive behaviors were coded by the first author for each participant during the *desirable gift* condition and *disappointing gift* condition for 20 s immediately following receipt of (a) the *desirable gift* and (b) the *disappointing gift*. In accordance with previous studies employing the disappointing gift paradigm (e.g., Cole, 1986; Cole et al., 1994; Davis, 1995; Kieras et al., 2005; Liew et al., 2004; Saarni, 1984), both gift-giving conditions occurred with the experimenter present in the playroom with the child.

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For both gift-giving segments, timing intervals for behavioral coding started when the participant opened the gift box and looked at the gift. Each participant received a score of "1" for each positive and negative behavior present for each segment resulting in a positive behavior score and a negative behavior score for each segment. If, for any segment, a participant repeated a particular behavior, that behavior was only counted once. Therefore, for each participant and condition (Desired Gift and Disappointing Gift), positive and negative scores ranged from 0 to 4.

Definition/ Description of Main Dependent Measures

Two dependent measures were assessed: (1) expressive emotion-related behavior and (2) (non)stutterings per 100 words. Talker group (i.e., CWS and CWNS) was the independent variable for this study.

Expressive behaviors—The primary dependent measures for this study were the positive and negative expressive behaviors displayed by each participant in the *desirable gift* condition preceding the Desirable Gift Conversation and the *disappointing gift* condition preceding the Disappointing Gift Conversation. As previously discussed, four positive and four negative expressive behaviors were coded in response to receiving a desirable gift and in response to receiving a disappointing gift.

Speech disfluencies—The first 100 words from each 5-minute free-play session (Baseline Conversation; Desirable Gift Conversation; Disappointing Gift Conversation) were obtained to determine (a) the percentage of stuttering-like disfluencies (SLD) per 100 words and (b) the percentage of nonstuttering-like disfluencies (nSLD) per 100 words. For the present study, SLDs are classified as sound/syllable repetitions, whole-word repetitions, audible sound prolongations or inaudible sound prolongations; whereas, nSLDs (also referred to as "other" disfluencies; Yairi & Ambrose, 1992) are classified as phrase repetitions, revisions and interjections (Bloodstein, 1995; Conture, 2001b; Cordes & Ingham, 1994; Pellowski & Conture, 2002).

Data Analysis

Dependent measures—Histographic assessment of expressive behaviors indicated that, for both CWS and CWNS, this dependent variable was *not* normally distributed. Histographic assessment of the remaining dependent variable (i.e., speech disfluencies) indicated that, for CWS, the (non)stuttering disfluencies were normally distributed, but those of CWNS were *not* normally distributed.

Differences between the talker groups (i.e., CWS and CWNS) in positive and negative expressive behavior after receiving a desirable gift and differences in negative expressive behavior between talker groups after receiving a disappointing gift were assessed using the Mann-Whitney *U* Test, a non-parametric test and therefore appropriate for non-normally distributed data. This analysis tested the hypothesis that after receiving a desirable gift, CWS would display more positive expressive behavior than CWNS and after receiving a disappointing gift, CWS would display more negative expressive behavior than CWNS.

For CWS, speech disfluencies were assessed using a repeated-measures analysis of variance (ANOVA) with the type of experimental conversation (i.e., Desirable, Disappointing) as the independent variable and (a) the percentage of SLD per 100 words and (b) the percentage of nSLD per 100 words during the desired gift conversation and the disappointing gift conversation as dependent variables. For CWNS, speech disfluencies after the conversations were compared using the Wilcoxon Signed-Rank test, a nonparametric statistical analysis for two related samples. These final analyses tested the hypothesis that during a

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conversational task following the receipt of a disappointing gift, CWS and CWNS would display more (non)stutterings when compared to (non)stutterings during a conversational task following the receipt of a desirable gift.

Ancillary Analysis

To assess whether CWS and CWNS had comparable knowledge of socially appropriate use of display rules, the KDR task was administered. Each participant's KDR score could range from 0 to 16 for responding correctly to a series of questions relating to each vignette (see Gross & Harris, 1988). Histographic assessment of KDR scores indicated that, for both CWS and CWNS, this variable was *not* normally distributed. Therefore, differences in KDR scores between talker group (i.e., CWS and CWNS) were also assessed using the Mann-Whitney *U* Test, and nonparametric correlations were used to analyze possible relations between expressive behaviors and KDR scores to determine whether the participants' actual knowledge related to their use of display rules during the DG procedure.

Intrajudge and Interjudge Measurement Reliability

Stuttering and nonstuttering-like disfluencies—Intra- and interjudge measurement reliability were obtained approximately 1-month from data collection completion for total disfluencies (SLD plus nSLD) and SLD. This 1-month gap was used in an effort to reduce any concerns regarding reliability given the fact that the 1st author was variably involved in data collection as part of her doctoral training. Five participants (≈ 31%) from each of the two talker group (CWS and CWNS) were randomly selected (n = 10) and all three samples (baseline conversation, desired gift conversation, and disappointing gift conversation) for each participant and his/her parent were used for intra- and interjudge reliability. *Intrajudge* reliability was assessed by having the first author judge each sample on two separate occasions – 1-month after data collection was completed for the mean frequency of total and (non) stuttering-like disfluencies for the first 100 words from two separate occasions. *Interjudge* reliability was assessed by having the 1st author and a doctoral student – both certified speech-language pathologists with experience in assessing stuttering – judge each sample for the mean frequency of total and stuttering-like disfluencies for the first 100 words.

Although the first author was privy to talker group classifications in the initial coding, no talker group classification was present during reliability coding. Furthermore, the second coder was unaware of talker group classifications and was unfamiliar with the present study's hypotheses of the study. Intra- and interjudge reliability percentages for the two speech disfluency measures were assessed using the following reliability index (e.g., Arnold, Conture, & Ohde, 2005; Byrd, Conture, & Ohde, 2007; Hartfield & Conture, 2006): (A +B/ [A+B] + [C+D]) × 100, where A = number of words judged stuttered on both occasions, B = number of words judged nonstuttered on both occasions, C = number of words judged stuttered on one occasion, and D = number of words judged nonstuttered on one occasion.

For CWS, intrajudge reliability for the mean frequency of total speech disfluencies and SLD were both 98%, and interjudge reliability percentages for the overall mean frequency of total and stuttering-like disfluencies were both 99%. For CWNS, intrajudge reliability for the mean frequency of total speech disfluencies and stuttering-like disfluencies for CWS was 99% and 98%, respectively, and interjudge reliability for the overall mean frequency of total and stuttering-like disfluencies was 99% and 100%, respectively. Intrajudge and interjudge measurement reliability findings are consistent with the first author's previously published empirical studies (Arnold, Conture & Ohde, 2005; Hartfield & Conture, 2006).

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Positive and Negative Expressive (Emotional) Behaviors—Intra- and interjudge measurement reliability were also obtained 1-month after completion of data collection for the number of positive and negative expressive behaviors by selecting five different participants (i.e., different from those used in assessing reliability of disfluency data) from each talker group (CWS and CWNS; total n = 10) for both segments per participant (i.e., [a] desirable gift, [b] disappointing gift). Intrajudge reliability was assessed by having the first author judge positive and negative behaviors on two separate occasions for each randomly selected segment (2 segments × 10 participants = 20 segments). Interjudge reliability was assessed by having the first author and the same doctoral student both certified speech-language pathologists judge each segment for positive and negative behaviors. As mentioned above, although the first author was privy to talker group classifications in the initial coding, no talker group classification was present during reliability coding. Furthermore, the second coder used for interjudge reliability was unaware of talker group classifications and was unfamiliar with the hypotheses of the present study. Intra- and interjudge reliability was assessed across participants using the reliability index described above (Arnold et al., 2005; Byrd et al., 2007; Hartfield & Conture, 2006).

Intrajudge reliability for the positive and negative expressive behaviors was 93% for the CWS and 92% for the CWNS, whereas interjudge reliability was 79% for CWS and 87% for CWNS.

Results

Descriptive Information

Stuttering/Speech Disfluencies—As expected, based on participant selection criteria, there was a statistically significant difference in average *total* disfluencies between CWS (M = 11.72, SD = 4.66) and CWNS (M = 4.58, SD = 1.23), $t(30) = 5.92$, $p < .001$. Likewise, there was a significant difference in *stuttering-like* disfluencies between CWS (M = 6.96, SD = 5.41) and CWNS (M = .1.04, SD = .54), $t(30) = 4.35$, $p < .001$.

Speech and language abilities—Based on participant selection criteria described above, all 32 participants in this study exhibited scores at or above the 16th percentile (less than 1 SD below the mean) on a series of standardized speech-language tests (PPVT-III, EVT, TELD-3, and GFTA-2). A multivariate analysis of variance (MANOVA) revealed no significant between-group differences on three of the four measures: EVT $F(1,30) = .11$, $p = .74$, TELD- Receptive Language $F(1,30) = .02$, $p = .89$, TELD- Expressive Language $F(1,30) = 1.16$, $p = .29$, and GFTA $F(1,30) = 1.50$, $p = .23$. Significant between-group differences were found in PPVT scores, $F(1,30) = 5.45$, $p < .03$, a finding consistent with Conture's (2001a) review of PPVT performance in young children who stutter. The potential influence that this between-group PPVT difference may have on present findings will be addressed in the Discussion. See Table 2 for means and standard deviations for each standardized test by talker group.

Between-group Differences in Expressive Behavior

Positive expressive behavior after receiving a desirable gift—A Mann-Whitney U Test was used with talker group as the independent variable and positive behaviors in response to the desirable gift as the dependent variable. Results indicated no significant difference between CWS and CWNS for positive behaviors displayed after receiving a desirable gift, $U = 117.50$, $p = .65$ (see Figure 1). This finding indicates that CWS and CWNS exhibited a comparable amount of *positive* expressive behaviors in response to receiving a desirable gift, when compared to CWNS, a result which failed to support our a priori hypothesis.

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Negative expressive behavior after receiving a disappointing gift—A Mann-Whitney *U* Test was again used with talker group as the independent variable and negative behaviors in response to the disappointing gift as the dependent variable. Results indicated a significant difference, between the CWS and CWNS for negative behaviors displayed after receiving a disappointing gift, $U = 79.00$, $p = .04$. Specifically, CWS exhibited more *negative* expressive behaviors in response to receiving a disappointing gift, when compared to CWNS, a finding which supports our a priori hypothesis (see Figure 2).

Within-Group Differences in (Non)stuttering Speech Disfluencies

The speech disfluencies produced by the two talker groups during conversations following receipt of the desired gift and following receipt of the disappointing gift were statistically analyzed separately (for SLD across conversations, see Figure 2; for nSLD across conversations, see Figure 3).

CWS: (Non)stuttering differences across conversations—Since histographic analyses of CWS (non)stuttering speech disfluencies suggested a normal distribution, a repeated-measures ANOVA was conducted with the gift condition as the independent variable and SLD per 100 words, as well as nSLD per 100 words as dependent variables. During conversation, following receipt of a desired gift in comparison to following receipt of a disappointing gift, results, although non-significant, approached significance indicating more SLD per 100 words, $F(1,15) = 4.25$, $p = .057$, and significantly more nSLD per 100 words, $F(1,15) = 4.77$, $p < .05$, during conversation following receipt of a desired gift than following receipt of a disappointing gift. These findings contradicted the a priori hypothesis that CWS would display fewer (non)stutterings per 100 words during a conversational task following the receipt of a desired gift and, consequently, more (non)stutterings following receipt of a disappointing gift.

CWNS: (Non)stuttering differences across conversations—Since histographic analyses of CWNS (non)stuttering suggest a non-normal distribution, a Wilcoxon Signed-Rank test was conducted with the gift condition as the independent variable and compared disfluencies from each of the three conversations as dependent variables: (a) Desired SLD per 100 words - Disappointing SLD per 100 words; (b) Desired nSLD per 100 words - Disappointing nSLD per 100 words.

Results indicated no significant difference, $Z = -1.42$, $p = .16$, in SLD per 100 words or nSLD per 100 words, $Z = -.60$, $p = .55$, during the conversation following receipt of a desired versus following a disappointing gift. These findings do not support the a priori hypothesis that CWNS would display more (non)stutterings per 100 words during a conversational task following the receipt of a disappointing gift.

Ancillary Results

Between group differences in KDR—A Mann-Whitney *U* Test was used with talker group as the independent variable and KDR score as the dependent variable. As expected, results indicated no significant difference in KDR scores between the two talker groups (CWS and CWNS; $U = 85.00$, $p = .11$, see Figure 4), suggesting that CWS and CWNS have comparable knowledge of how and why an individual should use prosocial display rules. Given that there was a significant between group difference in receptive vocabulary (i.e., PPVT), an additional analysis was conducted to test whether KDR and PPVT were correlated, which was found to be nonsignificant (PPVT, $r = .11$, $p = .54$). Further implications of this possible influence of between-group differences in PPVT are addressed in the discussion.

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Relation of KDR to expressive behaviors—KDR scores were also not significantly correlated for either talker group for any of the four variables: (1) positive behaviors (CWS: r = -.06, p = .83; CWNS: r = -.15, p = .58) and (2) negative behaviors (CWS: r = -.17, p = .53; CWNS: *no negative behaviors observed*) in response to a desired gift, (3) positive behaviors (CWS: r = -.18, p = .52; CWNS: r = -.25, p = .36) and (4) negative behaviors (CWS: r = .10, p = .72; CWNS: r = -.02, p = .95) in response to a disappointing gift.

Discussion

The present study resulted in two main findings and one ancillary finding. The first main finding was that, during the desired gift task, CWS and CWNS exhibited equal amounts of positive expressive behavior in response to a positive gift, a finding contrary to prediction. Consistent with our hypotheses, however, CWS exhibited significantly more negative expressive behaviors than CWNS in response to the disappointing gift. Also contrary to prediction, the second main finding indicated that CWS, but not CWNS, exhibited fewer stuttering-like disfluencies and nonstuttering-like disfluencies during conversation following receipt of a disappointing as compared to receipt of a desired gift. .Ancillary findings indicated that, as expected, CWS and CWNS exhibited comparable knowledge of display rules. Knowledge of display rules also had no significant relation to actual expressive behaviors displayed by either talker group, a finding consistent with previous research (e.g., Josephs, 1994). The implications of each of these findings are discussed below.

CWS and CWNS differences in negative expressive behaviors

The first main finding indicated that both talker groups exhibited comparable amount of positive expressive behavior in response to a positive gift. However, in response to a negative or disappointing gift, CWS exhibited significantly more negative expressive behaviors than CWNS. If emotion regulation was adequate for CWS during the negative situation, one would have expected a decrease in negative expressive behaviors in response to receiving a negative gift, like that exhibited by CWNS. In other words, societal display rules encourage regulating one's true response to the receipt of a non-desired gift in attempts to not offend or hurt the gift giver's sensibilities.

Of course, one could argue that no differences in expressive behaviors of CWS and CWNS in response to the desired gift suggest that CWS do not have inefficient regulation of emotional expression, at least in a positive situation. However, an alternate explanation is that there is less *need* for regulating emotions in a positive situation (i.e., appearing expressively happy in response to receiving a desired birthday gift). Simply stated, both CWS and CWNS demonstrated appropriate positive responses to the desired gift situation.

Overall, finding possible emotion regulatory differences between preschool-age CWS and CWNS supports the hypothesis that CWS possess relatively less efficient regulation of emotionality, at least in negative situations. This finding is consistent with previous empirical studies – again, primarily based on parent-report questionnaire – suggesting that CWS, when compared to CWNS, appear to be more reactive and less capable of regulating their reactivity (Karrass et al., 2006).

Interestingly, it should be noted, these between-group differences in emotion regulation occurred *prior to* these children engaging in actual conversation. In other words, prior to the initiation of any conversation, CWS demonstrated an increase in expressive behaviors in response to the disappointing gift. Perhaps, as some findings suggest (e.g., Anderson et al., 2003), CWS are less adaptable to novelty or unexpected change. Thus, this unexpected change created by the DG procedure – from a desired to a disappointing gift – could trigger a relatively strong negative reaction in CWS. The level and frequency of such reactions

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could challenge their possibly less than well-developed self-regulatory abilities to quickly/effectively modulate their emotions.

Alternatively, it may be the case that CWS have concerns with attention regulation. Such concerns might make it difficult for CWS to appropriately disengage and then reengage their attention when faced with environmental or situational change. This relative inability to quickly and/or efficiently shift attention with changing circumstances, to remain focused on previous rather than present events, may contributes to emotional discomfort during such circumstances. Whether CWS' difficulties adapting to change and/or shifting attention in response to change contribute to their stutterings is unknown but its possibility seems to warrant further empirical attention.

CWS exhibit more (non)stutterings during positive emotionality

The second main finding indicated that although CWS did not demonstrate fewer negative expressive behaviors and more positive expressive behaviors in response to a negative gift, they still decreased their stuttering-like and nonstuttering-like disfluencies after receiving that negative gift. This finding suggests that although in response to a negative situation CWS were not capable of regulating their expressive behaviors, they were able to regulate their disfluent speech behaviors. One might speculate that CWS find it challenging to concurrently regulate both expressive (nonverbal) and disfluent (verbal) behaviors, at least in the present experimental situations. As discussed immediately below, concurrent emotion and speech regulation for CWS may be, at least in some situations, an either/or proposition. That is, either CWS regulate their speech but not their emotion or vice versa. Or as suggested above, when regulating both concurrently, their ability to quickly and efficiently move, switch or oscillate between the two processes – emotion and speech – is less than rapid or efficient. Consistent with this notion is the finding of Anderson et al (2003) that CWS are less distractible than CWNS, that is, they have trouble disengaging, engaging and then reengaging attention and/or cognitive resources from one task to another and then back. Similar speculation has been put forth by Bosshardt (2006) suggesting that people who stutter are particularly challenged by dual-attention tasks.

Perhaps, for CWS, emotion regulation may involve two tasks or what Bosshardt (2006) called "concurrent attention-demanding cognitive processing": (1) regulation of emotional/expressive behaviors and (2) regulation of (non)stuttering disfluencies. Although Bosshardt's work in this area is based on adults who stutter, it could be the case that "dual-tasking" is also problematic for children who stutter – particularly in negative situations. As Bosshardt (2006) suggested, in his review of dual-task or dual attention task experiments, "…the speech of stuttering people is sensitive to interference from concurrent attention-demanding cognitive processing" (p.371). Alternatively, applied to the 'positive situation' in the present study, CWS had little reason to regulate positive emotions, thus a possible explanation as to why there was more stuttering in response to a desired gift or position situation. While certainly speculative, it could be the case that less need to regulate positive emotions parallels less need to regulate speech-language planning and production during the same situation. Interestingly, concurrent processing of a negative situation while attempting to talk is essentially an "attention-demanding" task. This seemingly had little impact on (i.e., minimally interfered with) the ability to effectively and fluently plan and produce speech-language. However, it did appear that negative affect may have affected CWS's ability to regulate emotional expressive behaviors.

None of the above should be taken to suggest that CWS' emotion regulation is the main, primary or sole causal contributor to their stuttering. What these findings do suggest, however, is that preschool-age CWS's ability to regulate emotions appears less than adequate and/or well-developed, at least during a negative situation. It is still unclear

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whether CWS's apparent differences in emotional processes actually contribute to difficulties they have initiating and maintaining fluent speech-language planning and production. It would appear that these emotional processes may contribute to (dis)fluent speech-language, but given the preliminary nature of the present study this speculation should be very cautiously interpreted.

CWS and CWNS do not differ in KDR

Regarding children's knowledge of display rules (KDR), an ancillary finding appears to suggest that both CWS and CWNS exhibited comparable KDR in a social setting. This supports the notion that any observed between-group behavioral differences were related to differences in the *ability* to regulate emotions rather than overall *knowledge* of display rules. Had we found significant differences in KDR between CWS and CWNS, some might have suggested that our reported between-group differences in expressive behavior from differences between CWS and CWNS in terms of display rule knowledge.

PPVT and KDR scores—CWS and CWNS did not significantly differ in KDR scores, but there was a significant between-group differences in receptive vocabulary (i.e., PPVT scores; see Conture, 2001a for review of previous PPVT findings with CWS/CWNS; see Hall, Wagovich, & Bernstein, 2007 for narrative and Ntourou, Conture & Lipsey, 2009 for meta-analytical assessment of language differences between preschool-age CWS and CWNS). We thought it appropriate, therefore, to briefly explore whether such differences in receptive vocabulary influenced our KDR findings. The PPVT was originally created as an assessment tool to approximate intelligence through assessing receptive vocabulary (Altepeter & Handal, 1985). Thus, one could speculate that between-group differences in PPVT indicate a subtle but important between-group difference in verbal intelligence, with such differences in verbal intelligence possibly influencing children's *knowledge* of display rules. Several researchers have empirically validated the connection between receptive vocabulary measured through the PPVT and intelligence, but suggest it primarily be used as a screening assessment for intelligence (Altepeter & Handal, 1985; Campbell, Bell, & Keith, 2001; Ingram et al., 1998; even though in the field of speech-language pathology the PPVT is commonly used as a means to assess an individual's receptive vocabulary). Even if PPVT provides some level of screening or initial information about verbal intelligence, PPVT scores, for CWS and CWNS combined, were not significantly correlated ($r = .11$, $p = .54$) with their KDR scores. Thus, our participants' PPVT performance appears to be a less than robust means for assessing KDR performance.

Caveats and Conclusions

Sample size—Although comparable to other studies of clinical populations, the sample size in the present study is modest and relatively low for both talker groups combined (n = 32; CWS: n = 16 and CWNS: n = 16). Findings from other comparable studies examining emotion regulation using the DG procedure were based on combined sample sizes that ranged from 45 to 79 participants (e.g., Cole et al., 1994; Davis, 1995; Josephs, 1994; Kieras et al., 2005; McDowell et al., 2000; Saarni, 1984), and only one comparable study used a combined sample size of 20 (e.g., Cole, 1986). Thus, although present results are suggestive of the possibility that emotion regulation may be challenging for CWS, one must be cautious when generalizing from our study because of its relatively small sample size.

Linguistic complexity of conversational samples—It seems relevant to note analyses of conversational samples observed after receiving the desired and disappointing gift were based solely on the frequency of SLDs and nSLDs in the first 100 words of speech. For example, we did not analyze such the linguistic complexity of the conversational samples to assess whether this differed between CWS and CWNS in response to a desired

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gift and a disappointing gift. It is possible – even though the conversational samples for CWS and CWNS were comparable in terms of number of words measured – that the two talker groups differed in the quality and/or quantity of their entire conversational response to receipt of a desired and disappointing gift. However, the present preliminary study only included 100 words of speech per conversational sample, providing less than a robust sample size for analyzing the linguistic quality. In future studies in this area, therefore, it is suggested that researchers collect larger conversational samples to permit more stable indexes of (non)stuttered disfluencies as well as linguistic processes.

Conclusions—The present study represents an initial attempt to use a well-established experimental design from the field of developmental psychology to empirically assess the relation of emotion to (non)stuttered disfluencies in preschool-age children who stutter. The knowledge obtained from this experimental investigation is in contrast with most other recent studies of the relation between emotion and stuttering in preschool-age children that has been based on parent-report questionnaires. Such questionnaires, although strong in many ways, have important weaknesses (for reviews of parent-report validity see Mangelsdorf, Schoppe, & Buur, 2003; Rothbart & Bates, 1998; Seifer, 2003). Therefore, the present study reports on one of the first experimental investigations, to the authors' knowledge, of relations between emotion and stuttering in preschool-age children and thus provides essential convergent validity to the findings of previous parent-report questionnaire studies.

In general, present findings are consistent with those assessing emotional reactivity, regulation and childhood stuttering (Karrass et al., 2006; Schwenk et al., 2006) suggesting that CWS differ from CWNS in terms of both situational as well as dispositional aspects of emotions. Specifically, in the present and a related study (Karrass et al., 2006), CWS exhibited less well developed emotional regulation relative to CWNS. Whether CWS's relative lack of emotional regulation, particularly during negative emotional valenced conversational situations, makes it difficult for them to initiate and maintain reasonably fluent speech-language production is still unknown. What is known, however, is that high reactivity coupled together with low regulation of that reactivity, can lead to less than competent social outcomes (Eisenberg, Fabes, Murphy, & Maszk, 1995). By extension, therefore, high reactivity combined with low and/or more effortful regulation for some CWS might contribute to their difficulties fluently initiating and maintaining speech-language planning and production. This possible contribution as well as present findings would seemingly encourage continued exploration of this intriguing topic in future empirical study.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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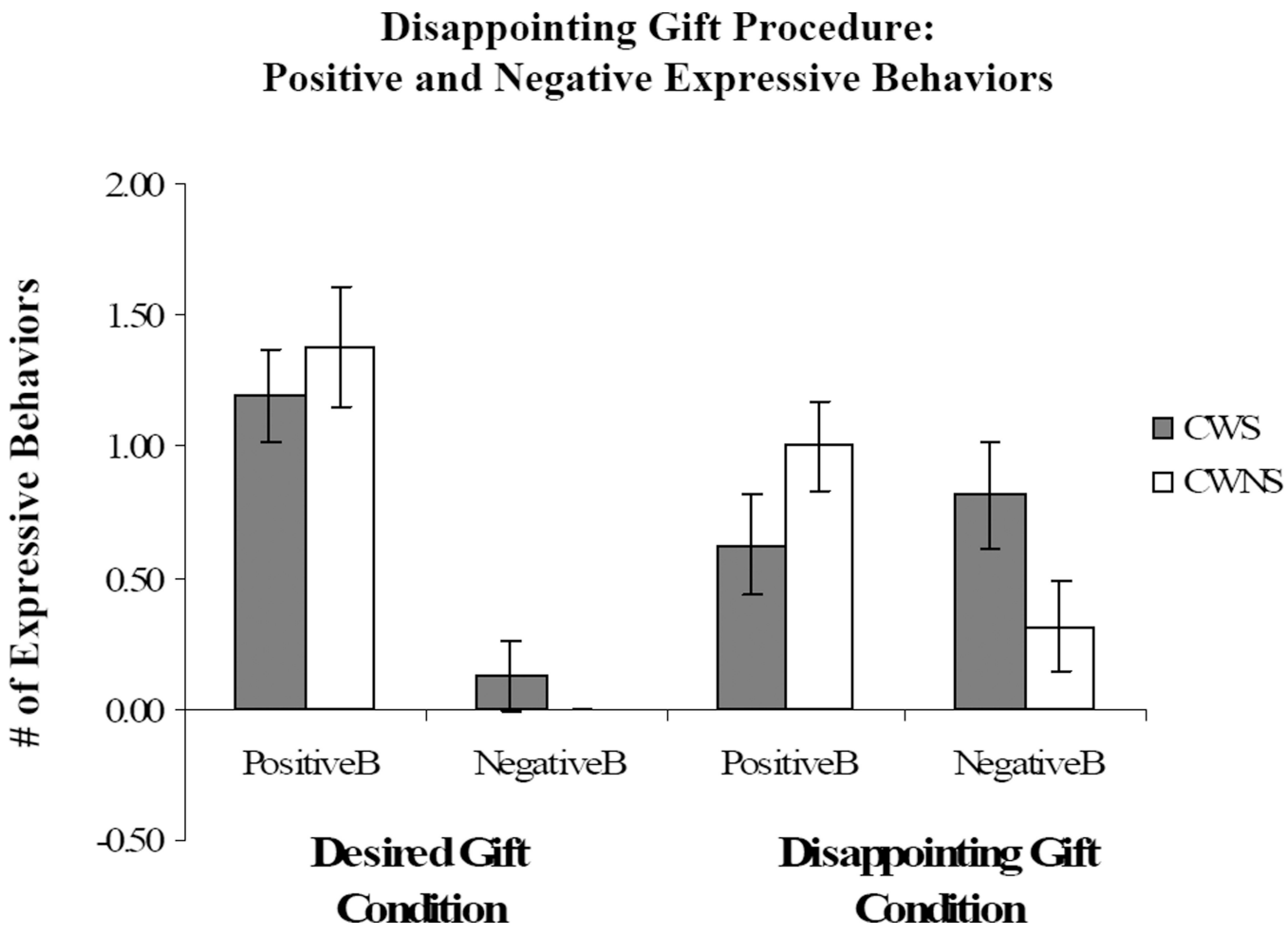

Figure 1.

Mean positive and negative expressive behaviors (± standard error) in desired gift and disappointing gift conditions for CWS (n = 16) and CWNS (n = 16); no significant difference, $U = 117.50$, $p = .65$, between CWS and CWNS for positive behaviors displayed after receiving a desirable gift; significant difference, $U = 79.00$, $p = .04$, between the CWS and CWNS for negative behaviors displayed after receiving a disappointing gift.

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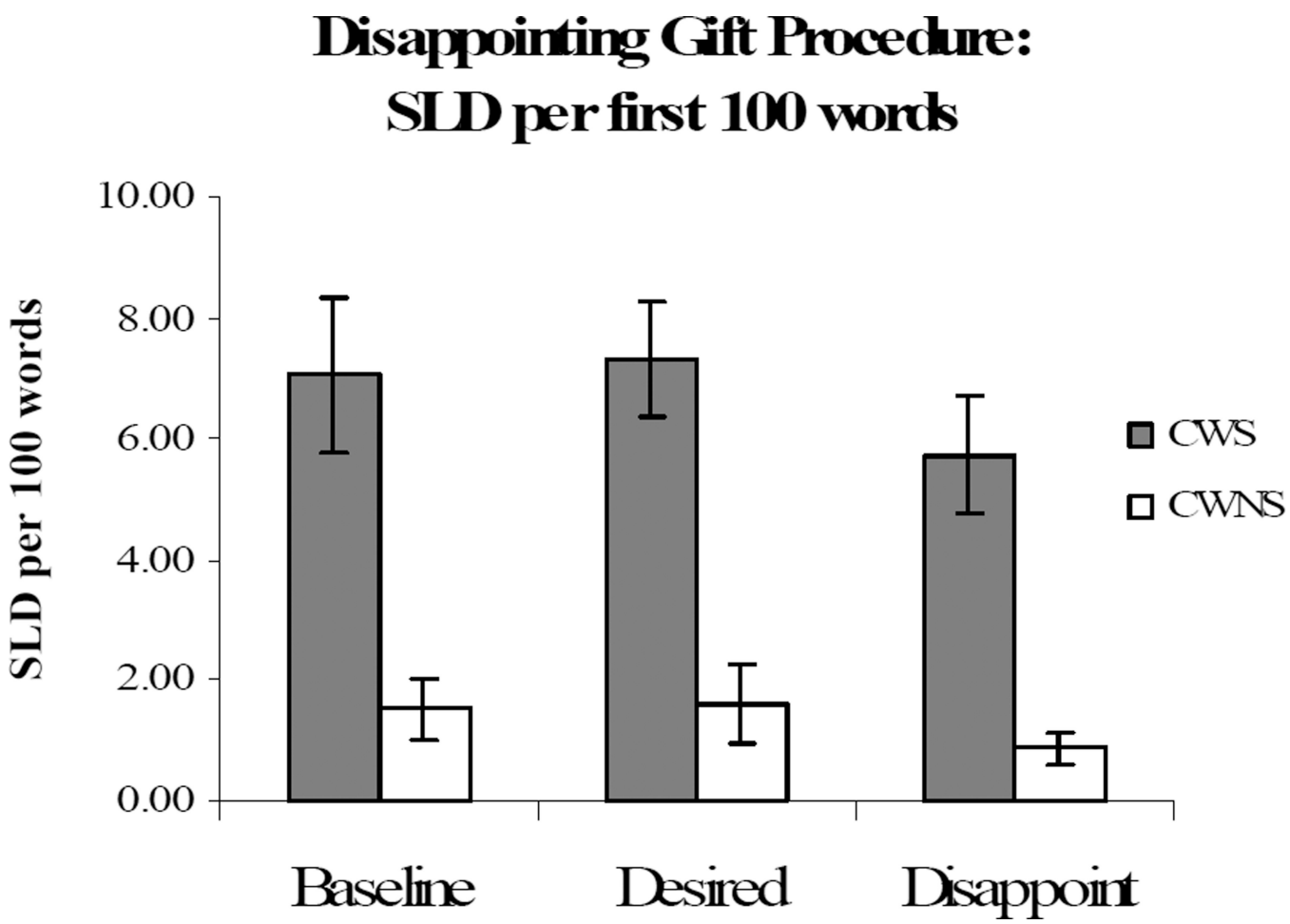

Figure 2.
Mean stuttering-like disfluencies (SLD) per the first 100 words of speech (± standard error) in each conversational task (baseline, desired, and disappoint) for CWS (n = 16) and CWNS (n = 16); although not significant, CWS exhibited more SLD per 100 words, $F(1,15) = 4.25$, $p = .057$. CWNS exhibited no significant difference, $Z = -1.42$, $p = .16$, in SLD per 100 words during the conversation following receipt of a desired versus following a disappointing gift.

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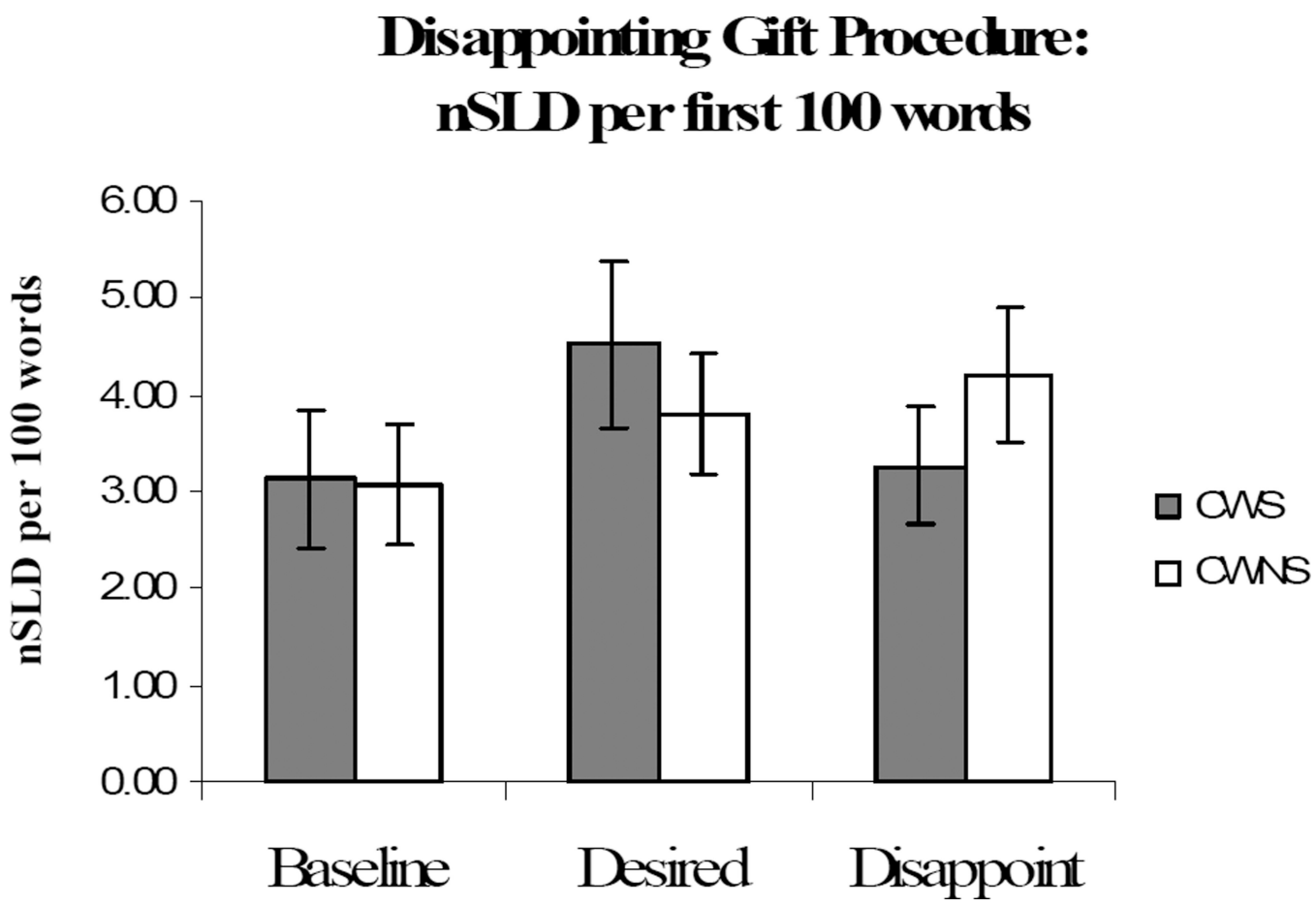

Figure 3.
Mean nonstuttering-like disfluencies (nSLD) per the first 100 words of speech (± standard error) in each conversational task (baseline, desired, and disappoint) for CWS (n = 16) and CWNS (n = 16); CWS exhibited significantly more nSLD per 100 words, $F(1,15) = 4.77$, $p < .05$, during conversation following receipt of a desired gift than following receipt of a disappointing gift; CWNS exhibited no significant difference, $Z = -.60$, $p = .55$, in nSLD per 100 words during the conversation following receipt of a desired versus following a disappointing gift.

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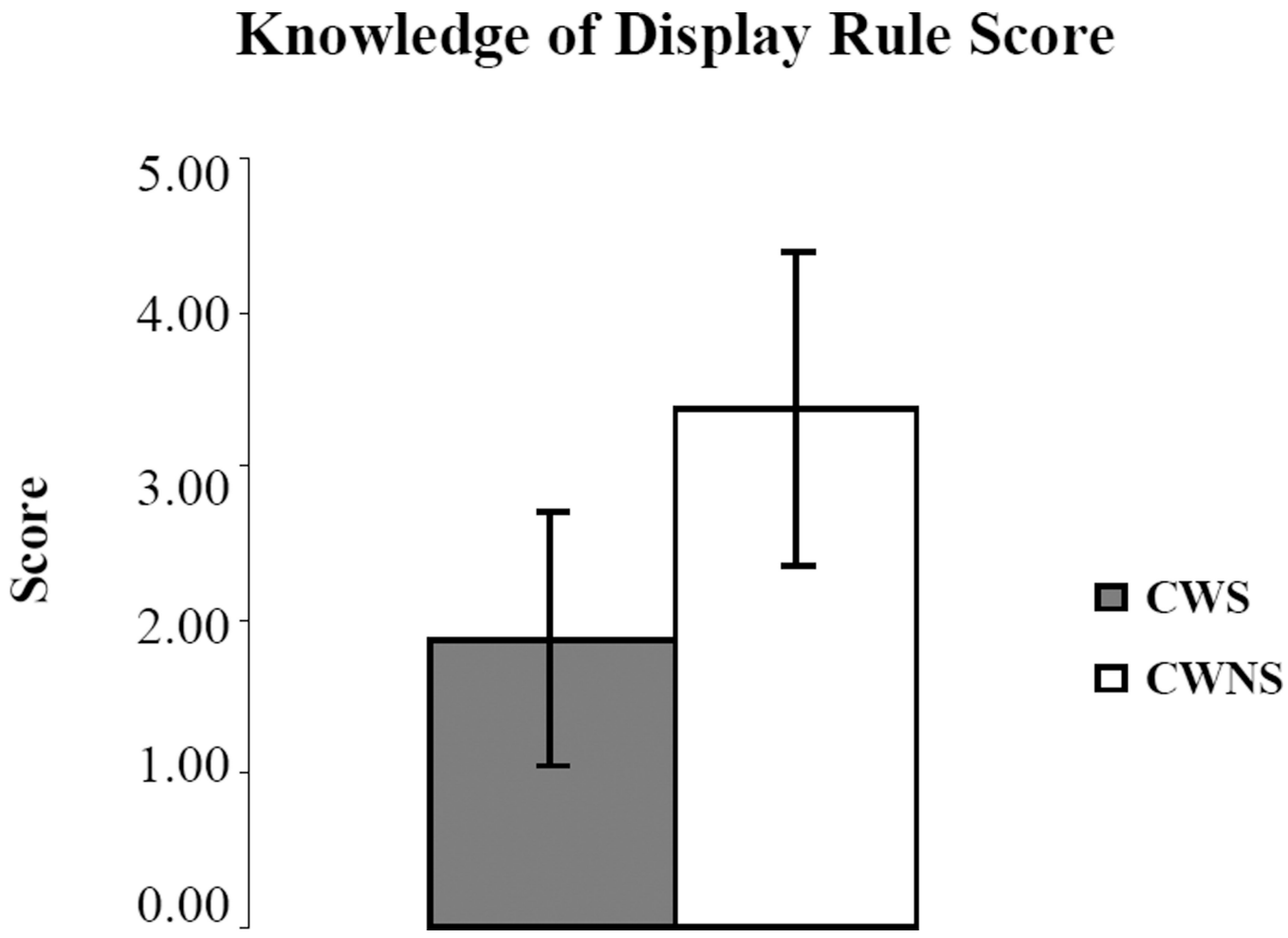

Figure 4.
Mean knowledge of display rules (KDR) score for CWS (n = 16) and CWNS (n = 16); no significant difference between CWS and CWNS in KDR scores, $U = 85.00$, $p = .11$.

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Table 1

Outline of study design. The dependent variables collected in Desirable Gift Tasks 2 and Disappointing Gift Task 3 were compared to dependent variables collected in Baseline Task 1.

Baseline Task (1)	**Desirable Gift Condition**			**Desirable Gift Task (2)**	**Disappointing Gift Condition**			**Disappointing Gift Task (3)**
Disfluency Data	*Positive Expressive Behavior*	*Negative Expressive Behavior*	*Engage With Gift*	Disfluency Data	*Positive Expressive Behavior*	*Negative Expressive Behavior*	*Engage With Gift*	Disfluency Data

Note: Positive Expressive Behaviors coded: (1) Related broad smile (teeth showing); (2) Closed lip smile; (3) Giggling, laughing; and (4) Use of expressive hand gestures while talking. Negative Expressive Behaviors coded: (1) Tense, square-looking smile (lips open, teeth may show); (2) Down-turned mouth (i.e., frown/ grimace); (3) Sharp breath exhalation, snorting, groaning; and (4) Sighing.

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Table 2

Standard Scores (means and standard deviation) by talker group (CWS and CWNS) for all four standardized speech-language tests

	CWS		CWNS		MANOVA
Speech-language test	**M**	**SD**	**M**	**SD**	
PPVT-III *	107	9.91	114	8.35	$F(1,30) = 5.45$, $p < .03$
EVT	112	8.77	113	13.12	$F(1,30) = .11$, $p = .74$
TELD-3					
Expressive subtest	104	11.92	108	9.31	$F(1,30) = 1.16$, $p = .29$
Receptive subtest	112	13.76	112	13.72	$F(1,30) = .02$, $p = .89$
GFTA-2	109	7.79	105	10.22	$F(1,30) = 1.50$, $p = .23$

Note.

* Significant between-group difference at $p < .05$.