A behavioral study of emotional reactivity and emotion regulation in preschool-age children who stutter

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European Symposium on Fluency Disorders
Antwerp, 2012
The purpose of this study was to experimentally assess whether emotional reactivity and emotion regulation differ between preschool-age children who do (CWS) and do not (CWNS) stutter and whether such emotional processes impact these children’s speech disfluencies/stuttering.
Emotional reactivity refers to an individual’s threshold and intensity of emotional arousal in response to internal and/or external stimuli.

Emotion regulation refers to the control and modification of emotional arousal.
Background Information
Parent-report questionnaire studies

* CWS are less adaptable to change, more emotionally reactive, and more negative in quality of mood than CWNS (Anderson, Pellowski, Conture, & Kelly, 2003; Eggers de Nil, & van den Bergh, 2010; Karrass et al., 2006; cf. Lewis & Goldberg, 1997)

Behavioral observation studies

* CWS are significantly more reactive to environmental stimuli and less able to quickly habituate to them (Schwenk, Conture, & Walden, 2007)

* CWS exhibit more negative emotional expressions than CWNS when receiving a disappointing gift (Johnson, Walden, Conture, & Karrass, 2010)

* CWS who use regulatory strategies less frequently and for shorter durations are more apt to exhibit increased stuttering-like disfluencies (Arnold, Conture, Key & Walden, 2011; Walden et al., 2011)
Research Questions
1. Do CWNS and CWS significantly differ in the amount of exhibited emotional reactivity (i.e., positive and negative affect) and emotion regulation (i.e., self-speech and off-task) behaviors during a neutral (control) and a frustrating (experimental) task?

2. Do CWNS exhibit greater increase in negative affect and emotion regulation behaviors, and greater decrease in positive affect during the frustrating than the neutral task?

3. Is there a relation between emotional processes (emotional reactivity and emotion regulation) exhibited during the tasks and the frequency of stuttering-like (SLDs) and non-stuttering-like, or other disfluencies (ODs) produced in subsequent narratives for CWS and CWNS?

4. Do CWS, when compared to CWNS, exhibit greater increase in the frequency of SLDs and ODs during the narrative following the frustrating task than during the narrative following the neutral task.
Methods
• 18 CWS (4♀, 14♂) and 18 CWNS (4♀, 14♂) between 3;0 – 5;11 years of age (CWS: M = 51.67, SD = 9.71; CWNS, M = 53.61, SD = 9.49)

• Participants completed a control and an experimental condition in a counterbalanced order. Each condition started with a 3-min emotion manipulation task followed by a narrative. At the beginning of the session, participants were presented with six gifts/prizes and were asked to select their favorite one. The selected gift was locked in a transparent box.
**Emotional Reactivity** during each of the emotion-eliciting tasks:
- Duration of *Negative Affect* / Duration of Task *100
- Duration of *Positive Affect* / Duration of Task *100

**Emotion Regulation** during each of the emotion-eliciting tasks:
- Duration of *Self-Speech* / Duration of Task* 100
- Duration of *Off-Task* / Duration of Task *100

**Disfluencies** during each of the narratives
- Percentage of Stuttering-Like Disfluencies (*SLDs*)
- Percentage of Other Disfluencies (*ODs*)
Main Findings
Positive Affect & Off-Task

No condition effect
No talker-group effect
No talker-group x condition interaction effect
**Negative Affect**

- **Condition effect**: The experimental manipulation was effective for both talker-groups.
- **Talker-group effect**: CWS exhibited significantly more negative affect than CWNS.
- **No Talker-group x Condition interaction**: CWS and CWNS responded similarly to the experimental manipulation.
Self-Speech

- CWS exhibited more self-speech than CWNS only in the control condition
- Only CWNS exhibited a significant increase in the amount of self-speech produced from the control to the experimental condition
• For CWS proclivity to *Self-Speech* during the control and experimental tasks was associated with greater percentage of *Stuttering* during the narrative tasks, est. $\beta = .04, p = .05$.

• For CWS greater duration of *Off-Task* behaviors during the tasks was negatively related to the percentage of *Stuttering* during the subsequent narratives, est. $\beta = -.04, p = .03$. 
Between-group Differences

* **Emotional Reactivity:** Finding that CWS were more emotionally reactive and exhibited *more negative emotional behaviors* than CWNS is consistent with previous results based on parent-report questionnaires and behavioral observations.

* **Emotion Regulation:** Contrary to previous research and initial hypotheses, CWS exhibited *more self-speech*. This increase in CWS’ s self-speech appeared to be ineffective in decreasing emotional reactivity.
* **Self-Speech:** The more CWS engaged in self-speech during the tasks, the more they stuttered during the narratives tasks. This relation might be:
  * Mediated by heightened emotional arousal
  * Attributed to concurrent/competing communicative intents

* **Off-Task:** The more CWS shifted their attention away from the tasks, the less they stuttered during the narratives. This finding might suggest that attention shifting facilitates speech fluency by:
  * Modulating heightened emotional responses
  * Diverting attention away from overmonitoring of the ongoing speech act.
CONCLUSION

Findings from this study support the notion that emotional processes are associated with childhood stuttering and likely contribute to the difficulties that at least some CWS have establishing normally fluent speech.