



Children Who Stutter: Easy, Difficult, or Slow to Warm Up?

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Childhood Stuttering and Temperament

- Temperament is a psychological construct that relates to the style with which a person interacts with his/her environment (Kristal, 2005).
- Temperament has been considered a possible factor differentiating between children who stutter and children who do not stutter.
- In a variety of sources authors have suggested that the temperament of children who stutter differs from that of their normally fluent peers, and that temperament may contribute to the onset, development and maintenance of stuttering (Anderson, Pellowski, Conture, & Kelly, 2003; Conture, 2001; Embrechts, Ebben, Franke, & van de Poel, 2000; Guitar, 1998; Howell, Davis, Patel, Cuniffe, Au-Yueng, and Williams 2004; Sermas & Cox, 1982; Wakaba, 1997).
- Guitar (1998) suggested that the possibility of sensitive temperaments, combined with specific neural vulnerabilities, could lead to the development of stuttering. Guitar described a connection between this sensitive temperament, the child's increased reactivity to their environment, and early disfluencies.

Temperament

- "Temperament or behavioral style refers to the manner in which an individual interacts with the environment" (Fullard, McDevitt, & Carey, 1984).
- "Temperament can be equated to the term behavioral style. It refers to the *how* rather than the *what* (abilities and content) or the *why* (motivations) of behavior influenced by environmental factors in its expression and even in its nature as development proceeds." (Thomas & Chess, 1977 p.9).

New York Longitudinal Study

- While the individual nature of behavioral styles is recognized, there are nine identified dimensions of temperament posed by researchers in the area of child temperament. These dimensions were identified during the New York Longitudinal Study (NYLS) completed by Thomas, Chess, Birch, Gertzog, & Korn (1963). Thomas & Chess (1996) described the procedures of the NYLS.
- The NYLS was a longitudinal study which followed 138 children for a period of six years. Parents were interviewed about the behavioral style of their children beginning when the children were 2 to 3 months old. Follow-up parent interviews were completed frequently, and the participants were followed into adulthood. Parents were asked to describe their child's behavior and asked follow-up questions to specifically identify behavioral patterns. The data revealed nine temperament dimensions and three temperament constellations

The NYLS data revealed nine temperament dimensions and three temperament constellations

Temperament Dimensions

1. Activity Level
2. Rhythmicity
3. Approach/Withdrawal
4. Adaptability
5. Threshold of Responsiveness
6. Intensity of Reaction
7. Quality of Mood
8. Distractibility
9. Attention Span and Persistence

Temperament Constellations

1. Easy Child
2. Difficult Child
3. Slow to Warm-Up Child

Temperament & Stuttering Research

Lewis & Golberg (1997)

Strong separation between groups: mood, adaptability, rhythmicity, and activity level. The stuttering group was rated more positively for these dimensions. Stuttering group **best fit the temperament constellation: of the Easy Child.**

Embrechts, Ebben, Franke, and van de Poel (2000)

Children who stutter were found to be more active and impulsive than non stuttering children and the CWS had lower attentional focusing and inhibitory control and less perceptual sensitivity than CWNS. These dimensions can be compared to the NYLS dimensions of activity, adaptability, distractibility, and threshold of responsiveness.

Anderson, Pellowski, Conture, & Kelly (2003)

Children who stutter were:

1) slower to adapt, 2) had greater distractibility, and 3) had more irregular physiologic functions than children who do not stutter.

Howell, Davis, Patel, Cuniffe, Downing-Wilson, AU-Yeung and Williams (2004)

Children who stutter were found to be more active, more negative in quality of mood, and less adaptable and persistent than children who do not stutter.

Goodness of Fit

- It appears that findings have not been consistent with regard to temperament differences between CWS and CWNS. The most consistent finding across the four studies previously conducted is that adaptability differs between groups; however the direction of difference is not as clear.
- Three of the four investigations (Anderson et al., 2003; Embrechts et al. 2000; and Howell et al., 2004) found that children who stutter were less adaptable than non fluent peers. Lewis and Golberg (1997) found that the difference between groups was in the direction of children who are at risk for the development of stuttering appearing more adaptable than the control group.
- The findings have not been as consistent across investigations for the other dimensions found to differ across groups. Activity, rhythmicity, mood, persistence, distractability, and threshold were found to also found to differ among groups however, the direction of difference for this dimension was not consistent across investigations.
- Given the lack of consistent findings across studies it may be important to evaluate more global measures of temperament (e.g., goodness of fit, emotional reactivity, and temperament constellations)

- "Goodness of fit results when the properties of the environment and its expectations and demands are in accord with the organism's own capacities, characteristics, and style of behaving. When consonance between organism and environment is present, optimal development in a progressive direction is possible. Conversely, poorness of fit involves discrepancies and dissonances between environmental opportunities and demands and the capacities of the organism so that distorted development and maladaptive functioning occur" (p. 3).
- Guitar (1998) postulated that increased environmental reactivity could lead to added physical tension, and increased tension could compound initial disruptions and disfluencies and make them more distressing for the child. He described a scenario in which stuttering could result from a "poorness of fit" between constitutional factors and environmental factors. A parallel can be drawn between this concept of a poorness of fit between environmental and constitutional factors within the child who stutters and the demands capacity model viewpoint that the demands (e.g., linguistic, environmental, or developmental requirements) placed on the child who stutters are greater than his/her capacity or abilities.

Emotional Regulation/Reactivity

Karrass, Walden, Couture, Graham, Arnold, Hartfield, and Schwenk (2006) investigated emotional regulation and reactivity of preschool children who stutter with data adapted from the BSQ.

- **CWS** were more emotionally reactive to stressful, challenging, and exciting situations than fluent peers, they also had more intense levels of arousal when faced with these situations, and additionally
- **CWS** were less able to regulate their emotions following an emotional arousal than CWNS.

Temperament Constellations

The NYLS data revealed three temperament constellations made up of specific combinations of the nine temperament dimensions. The three temperament constellations were identified as Easy Child, Difficult Child, and Slow to Warm-Up Child.

- Temperament constellations Provide a more overall perspective on manageability and than individual dimensions.

Temperament Constellations

- The **Easy Child** constellation was categorized by regularity, positive approach, high adaptability, mild to moderately intense mood, and a moderately intense mood that is typically positive.
- The **Difficult Child** is on the opposite end of the temperament spectrum. This constellation is categorized by irregular biological functions, negative withdrawal from new stimuli, nonadaptability, and intense mood that tends to be negative. The Authors stressed that there are positive features expressed by a child whose temperament scores place them into this constellation. The terms "feisty" or "spirited" temperament were suggested as alternate terms that better represent children in this constellation.
- The third constellation is that of the **Slow to Warm Up** child. These children typically express mild negative intensity in adapting to new stimuli after repeated contact, mild intensity of reactions both positive and negative, and fewer tendencies for irregular body functions than the Difficult Child constellation.

Temperament Constellations and Stuttering

- The temperament constellations, (i.e., easy, difficult, and slow-to- warm- up) should be explored in order to provide a more general representation of the temperament of children who stutter.
- Lewis & Golberg (1997) found that children at-risk for stuttering best fit the temperament constellation of the easy child. This finding was at odds with the clinical assumptions made by Sermas & Cox (1982) that children who stutter possess a difficult child temperament profile. Clearly, further investigation of the temperament constellations of children who stutter is needed.

The Purpose of this investigation was to compare the temperament constellations of children who stutter and children who do not stutter with data reported by the NYLS study with regard to the temperament constellations of Easy, Difficult, and Slow to Warm Up.

Method

- **Participants:**
 - 20 CWS and their parents
 - 20 CNS and their parents
 - All participants ranged in age from 3 to 6
 - CWS mean age 4;2
 - CNS mean age 4;4
- | | |
|------------------------------|------------------------|
| CWS | CNS |
| 3 or more SLD | Less than three SLD |
| Concern (clinician & parent) | No concern re: fluency |

Participant Recruitment

- **Children who Stutter:** (Parents) sought a fluency evaluation at the University speech and hearing clinic due to concern about possible stuttering.
- **Children who do not stutter:** were recruited with an invitation letter from several area preschools/daycare centers. These parents volunteered to take part after the study was described in the invitation letter.

Rater agreement disfluencies coding

Agreement was established between a board certified fluency mentor and the investigator

Inter rater agreement

Presence/Absence
99.3% Agreement

Category of Disfluency (SLD vs. OD)
100% Agreement

Intra rater agreement

Presence/Absence
99.5 % Agreement

Category of disfluency
(SLD vs. OD)
100% Agreement

Temperament Assessment

- The temperament assessment used was largely based on the NYLS
- The Behavioral Style Questionnaire (BSQ) developed to assess children with a series of questions for each of the 9 dimensions.
- Parents complete questionnaires rating dimensions on a likert scale.

BSQ 110 Items

- Total of **100 objective statements** about child's typical behavioral style rated by caregiver.
 - Varying number of statements depending on dimension ranges from 9 to 13 statements per dimension.
- **Final section rate 10 statements.** These are more subjective based on **general impressions.**
 - General impressions rated for each of the nine dimensions.
 - Final item general impression about overall manageability of the child.

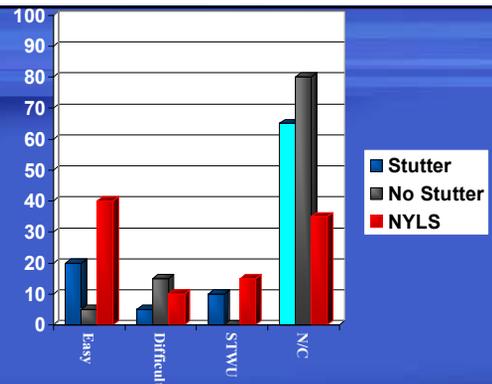
Temperament Dimension	Example Statement
Activity	The child runs ahead when walking with parents.
Rhythmicity	The child has bowel movements at the same time everyday.
Adaptability	The child can be coaxed out of a forbidden activity.
Approach/Withdrawal	The child is ready to try new things.
Threshold of Response	The child notices minor changes in the mother's dress or appearance.
Intensity	The child responds intensely to disapproval.
Mood	The child is moody for more than a few minutes when corrected or disciplined.
Distractibility	The child seems not to hear when involved in a favorite activity.
Attention Span/Persistence	The child spends over an hour reading a book or looking at the pictures.

Identification of Temperament Constellations

• Raw scores representing each of the nine temperament dimensions were evaluated and compared to the normative means provided by Carey (1996) scores were selected if they are greater than or less than the mean depending on the definition of each constellation.

• Children in each group were identified as fitting the **Easy child** temperament constellation if the individual raw scores were less than the means for the normative sample for the temperament dimensions mood, rhythmicity, adaptability, intensity, and approach.

- Children were identified as fitting the **Difficult child** temperament constellation if they had higher than normative mean dimension scores for rhythmicity, approach/withdrawal, adaptability, intensity, and mood.
- Children best fit the **Slow-to-Warm-Up** constellation if the mean temperament dimension scores for approach/withdrawal, adaptability, and mood were higher than the normative means, and the mean dimension scores for activity and intensity were lower than the normative means.



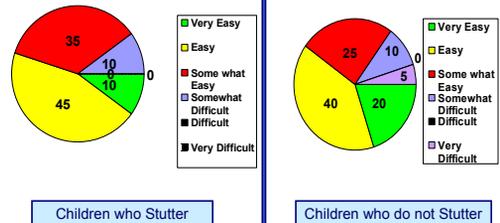
Discussion of Results

- The current investigation aimed to determine if children who stutter predominantly fit one temperament constellation, and if temperament constellations were different from the constellations identified for the non-stuttering group.
- For the current investigation 20% of the stuttering group, and 5% of the non-stuttering group fit the Easy child temperament constellation.
- The results of the current investigation appear to lend support to the findings of Lewis & Golberg (1997) in that more of the stuttering group fit the Easy child temperament constellation than the non-stuttering group.
- However, it should be noted that both the stuttering and non-stuttering groups had a smaller proportion of children who stutter fitting the Easy child constellation than the normative data provided by the NYLS suggests. Interestingly, the proportion of children in the Difficult and Slow to Warm Up temperament constellations was smaller than the NYLS normative sample for both the children who stutter and the children who do not stutter.

- More important than a difference between groups in this case however, is the comparison to the normative sample. Children who stutter did not have similar proportions of the sample in the Easy child temperament constellation, in fact there were fewer children in both the stuttering and non stuttering groups than the NYLS that fit the Easy child constellation.
- It is possible that the participant's motivation for taking part in the current study may account for this discrepant finding.
- Perhaps the parents of children (who both stutter and fit the Easy temperament constellation) did not seek treatment because, aside from the stuttering, the Easy child is very manageable.
- It is also possible that the greater number of non-stuttering children in the difficult group could be a function of the motivation for participation.
- Parents of children in the non-stuttering group may have agreed to participate because they felt their child's temperament was somehow different from peers and therefore had an interest in what kind of temperament their child possessed.

- Therefore, care should be taken when interpreting these results because of the possibility of non-representative samples used to generalize to the population at large.
- However, the presence of a non-representative sample is not supported by the general impressions of overall manageability.
- Parents in both the stuttering and non-stuttering group rated their child with a mean manageability score that would place them between easy and somewhat easy to manage.
 - One rated statement the final item of the BSQ which asks parents to rate how manageable their child is compared to other kids his/her age.
 - No Difference was found between groups Both groups had a mean of 2.45

Manageability Figures Percentage of children falling into each of the 6 overall manageability rating choice based on parental ratings of overall manageability



Conclusions

- Children who Stutter do not appear to be more difficult to manage or be more likely to have difficult to manage or slow to warm up temperament types than children who do not stutter.
- The constellation with the greatest number of children was that of Easy for the children who stutter and the NYLS sample.
- This seems to support findings by Lewis and Golberg (1997) that children who stutter are more likely to fit the Easy child constellation than the Difficult or Slow to Warm Up constellations.
- However, A large number of children in the current study could not be classified into any of the three temperament constellations identified by Thomas and Chess.
- Therefore, additional options for exploring global measures of temperament (e.g., goodness of fit, emotional reactivity & regulation) should be explored.

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