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Temperament and childhood stuttering: Theory, evidence, and clinical practice

Robin Jones, Ph.D., CCC-SLP
Assistant Professor
Department of Hearing and Speech Sciences
Vanderbilt University Medical Center

Email:
Robin.m.jones@vanderbilt.edu
Website:
http://kc.vanderbilt.edu/childhoodstuttering/

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Learner outcomes

1. After this course, participants will be able to define temperament and identify approaches that can be used to measure it.
2. After this course, participants will be able to discuss the role of temperament in theoretical models of stuttering and describe these characteristics in young children who stutter.
3. After this course, participants will be able to discuss potential clinical implications of temperament in the treatment of childhood stuttering.

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Purpose

The purpose of this presentation is to provide a brief overview on the construct of temperament, including individual differences in reactivity and regulation, especially with regard to childhood stuttering.

Empirical evidence and theoretical perspectives on the role of temperament in childhood stuttering will be discussed, with special emphasis on its relevance to clinical practice in speech-language pathology.

Key acronyms:

- CWS — Children who stutter
- CWNS — Children who do not stutter

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Articles

- ***Article 1***: Temperament, speech and language: An overview (Conture et al., 2013)
- ***Article 2***: Temperament dimensions in stuttering and typically developing children (Eggers et al., 2010)
- ***Article 3***: Temperament, emotion, and childhood stuttering (Jones et al., 2014)

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Overview of talk

- **Definitions and measurements of temperament** as well as its role in speech and language (Article 1)
- **Theoretical account** for the role of temperament in childhood stuttering (Article 1 & 3)
- **Empirical evidence** on the contribution of temperament to stuttering (Articles 2 & 3)
- Temperament and childhood stuttering: **Clinical Implications** (Article 3)
- Summary
- Questions and Answers

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Article 1: Temperament, speech and language: An overview

Journal of Communication Disorders 46 (2013) 125–142

Contents lists available at SciVerse ScienceDirect

Journal of Communication Disorders

Temperament, speech and language: An overview

Edward G. Conture [a,*], Ellen M. Kelly [a], Tedra A. Walden [b]

[a] Department of Hearing and Speech Sciences, Vanderbilt University, United States
[b] Department of Psychology and Human Development, Vanderbilt University, United States

Conture, E. G., Kelly, E. M., & Walden, T. A. (2013). Temperament, speech and language: An overview. *Journal of Communication Disorders*, *46*(2), 125–142.

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Temperament: Defined

- **Temperament:** "…individual differences in emotional, motor, and attentional reactivity measured by latency, intensity and recovery of response, and self-regulation processes such as effortful control that modulate reactivity" (p. 207) (Rothbart & Derryberry, 1981) as cited by Rothbart (2007)
- "These tendencies are **biologically based** and are linked to an individual's **genetic endowment**" (p. 207) (Posner, Rothbart, & Sheese, 1981) as cited by Rothbart (2007)
- "Temperament describes an individual's **tendencies**, dispositions, or capacities. These **tendencies are not continually expressed**, they **depend on the appropriate eliciting conditions**, that is, the **content of situations**" (Rothbart, 2011, p. 14)

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Emotion Reactivity and Regulation: Defined

- ***Reactivity*:** Emotional, motoric and attentional reactions
- ***Regulation*:** Processes that regulate reactivity, including the tendency to approach or withdraw from stimuli and/or direct our attention toward or away from the stimuli
- ***Measured/observed by*:** Latency, intensity, frequency, and/or duration of reactive or regulatory behaviors/processes
  - Measures may be based on (a) caregiver reports, (b) coded behavior observation of positive/negative reactivity or attention regulation (e.g., shifting away from stimulus, number or duration of regulatory attempts), and/or (c) physiological measures of sympathetic and parasympathetic nervous system activity

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Some possible relations between Emotional *Reactivity* (arousal) and Emotional *Regulation* (coping).

	High Regulation	Low Regulation
High Reactivity	Adaptive Outcome	*Less Adaptive Outcome*
Low Reactivity	*Less Adaptive Outcome*	Adaptive Outcome

"My point is, life is about balance. The good and the bad. The highs and the lows. The pina and the colada." – Ellen DeGeneres

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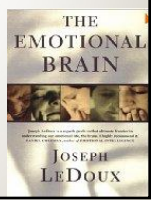
Emotion

- **"*Emotion*: a process, a constant, vigilant process…which periodically reaches a level of detection for the person (i.e., a feeling) or an observer" (Cole et al., 2004, p. 319)**
- ***Emotional behavior* can be unconscious, quick (LeDoux, 1996).**
- ***Feelings* can be conscious, slower (LeDoux, 1996).**

Cole, P. M., Martin, S. E., and Dennis, T. A. (2004). Emotion regulation as a scientific context: Methodological challenges and directions for child development research. *Child Development, 75, 317-333.*

LeDoux, J. E. (1996). *The emotional brain.* New York: Simon & Schuster.



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Temperamental versus Situational Emotion

Temperamental emotion: **relatively stable, trait-like aspects of emotional responding – here considered as a *diathesis*.**

Situational emotion: **relatively variable, state-like aspects of emotional responding - here considered in response to a *stressor.***

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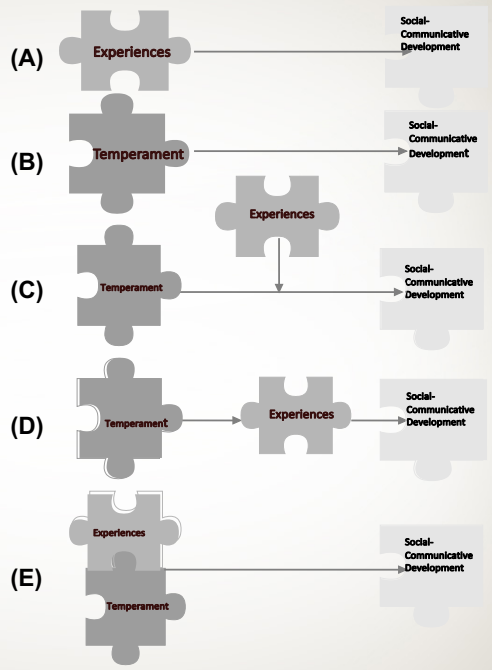
Five possible perspectives regarding *experiential-environmental* and *temperamental* influences on children's social-communicative development:

(A) Environmental perspective,
(B) General *temperamental* perspective,
(C) Experiences ***moderate*** temperament influence,
(D) Experiences ***mediate*** temperament influence and
(E) Goodness of fit between child's *experiences* and child's temperament.

After Conture, Kelly & Walden (2013) .



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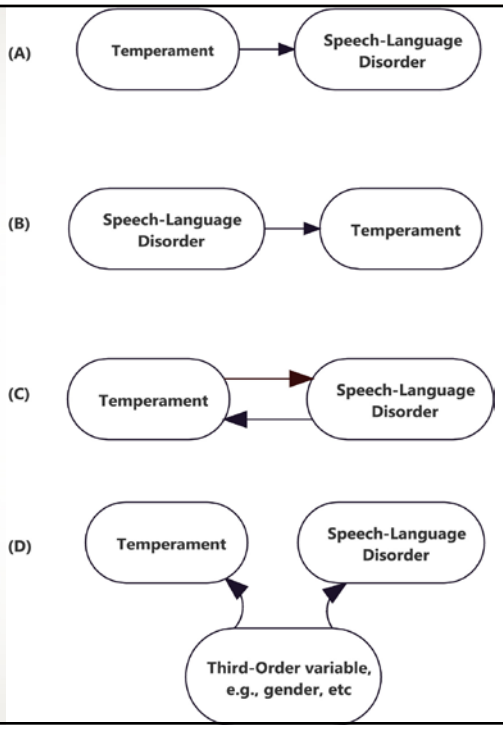
(a) Causal:
Temperament causes Stuttering

(b) Consequential: Temperament consequence of stuttering

(c) Bi-directional:
Temperament causes stuttering and stuttering causes temperament

(d) Correlation:
Temperament related to stuttering because both related to a third variable (e.g., gender, maternal education)

After Conture, Kelly & Walden (2013) .



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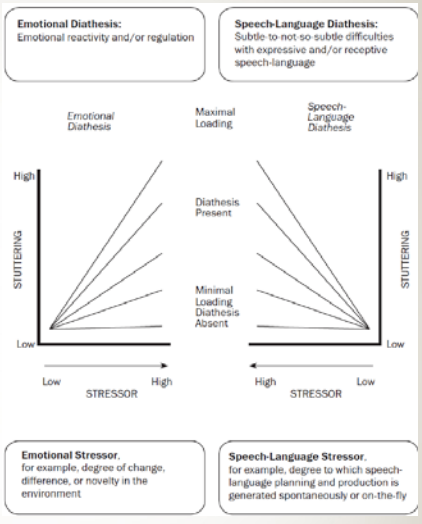
Emotions and developmental stuttering

One theoretical account of childhood stuttering (Conture & Walden, 2012), suggests that **emotional reactivity**, **emotional regulation** and **their interaction** are associated with the onset and the development of childhood stuttering.

The association between emotion and childhood stuttering has been examined by means of:

- **-Caregiver reports**
- **-Coded behavioral observations**
- **-Psychophysiology**



After Conture, E.G. &, Walden, T.A. (2012). Dual Diathesis-Stressor Model of Stuttering. In Y.O. Filatova (Ed.), *Theoretical Issues of Fluency Disorders* (pp. 94-127). Moscow: National Book Centre. ISBN: 978-5-4441-0005-9

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Temperament, Emotion and Childhood Stuttering:

Empirical study of a complex relationship

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Article 2: Temperament dimensions in stuttering and typically developing children (Eggers et al., 2010)

Temperament dimensions in stuttering and typically developing children

Kurt Eggers [a,b,*], Luc F. De Nil [b,c], Bea R.H. Van den Bergh [d,e,f]

[a] *Department of Speech-Language Therapy and Audiology, Lessius University College, Belgium*
[b] *Experimental Otorinolaryngology, Department of Neurosciences, University of Leuven, Belgium*
[c] *Department of Speech-Language Pathology, University of Toronto, Canada*
[d] *Department of Psychology, Tilburg University, The Netherlands*
[e] *Department of Welfare, Public Health, and Family, Flemish Community, Belgium*
[f] *Department of Psychology, University of Leuven, Belgium*

Received 16 July 2010; received in revised form 23 October 2010; accepted 27 October 2010

Eggers, K., De Nil, L. F., & Van den Bergh, B. R. (2010). Temperament dimensions in stuttering and typically developing children. *Journal of Fluency Disorders*, *35*, 355–72.

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Purpose

- "The purpose of this study was to investigate the relationship between temperament and developmental stuttering, using the Children's Behavior Questionnaire—Dutch (CBQ-D; Van den Bergh & Ackx, 2003), a parental temperament questionnaire." (p. 356)

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Children's Behavior Questionnaire

- ***Children's Behavior Questionnaire (CBQ)*: Rothbart, M., Adadi, S., Hershey, K & Fisher, P. (2001). Investigations of temperament at 3-7 years: The Children's Behavior Questionnaire. *Child Development*, 72, 1394-1408).**
- **CBQ versions available for nearly all age ranges (i.e., 3 months – adults) and are available in "short" and "very short" lengths**
- **Available at:**
  - **http://www.bowdoin.edu/~sputnam/rothbart-temperament-questionnaires/instrument-descriptions/childrens-behavior-questionnaire.html**

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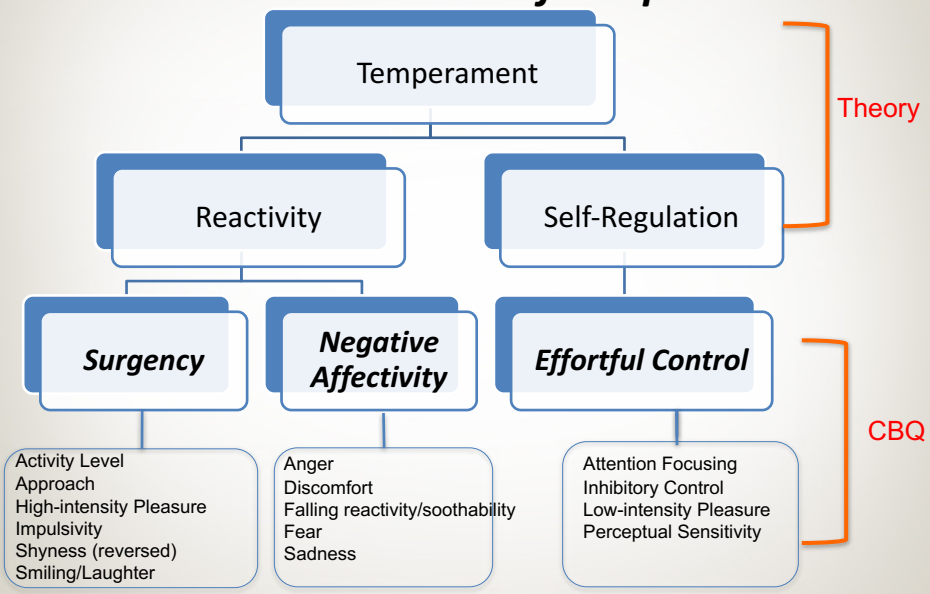
Rothbart's (2011) model of temperament



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Three broad factors arising from factor analysis of CBQ:

- **Surgency:** disposition to the positive emotions, rapid approach to potential awards and high activity level (similar to extraversion)
  - Example item from ***Approach*** subscale:
    "Becomes very excited when planning for trips."
- **Negative affect:** fear, angry, frustration, discomfort, sadness and slowness to recover from distress
  - Example item from ***Anger/frustration*** subscale:
    "Gets quite frustrated when prevented from doing something s/he wants to do."
- **Effortful control:** inhibitory control, attention focusing, low-intensity pleasure, and perceptual sensitivity.
  - Example item from ***Inhibitory control*** subscale:
    "Can easily stop an activity when s/he is told 'no'."

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Eggers et al. (2010): Temperament and Stuttering

- Theoretical perspectives and empirical evidence suggest that temperament may be importantly involved in the ***onset and development of stuttering (e.g., heightened reactivity and decreased regulation)***
  - However, at the time of the Eggers et al. (2010) study, no other study had specifically conceptualized both ***positive/negative reactivity and self-regulation*** in such a highly integrated manner.
- Similar temperament characteristics in other disorders play significant roles in ***disorder onset***, ***stress responses***, ***conditioning processes***, and ***treatment outcomes***

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Eggers et al. (2010): CBQ in the study of childhood stuttering

- ***Hypotheses:***
  - CWS, compared to CWNS, will exhibit ***heightened*** scores on ***negative/positive reactivity*** and on some of the individual reactivity-related scales
  - CWS, compared to CWNS, will exhibit ***lower*** scores on ***effortful control (i.e., self-regulation)*** and on some of the individual scales related to self-regulation
  - Temperament in CWS will be ***associated*** with ***length of therapy and/or stuttering severity***

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Method

- **Participants** (matched for age and gender):
  - Children who do not stutter (n = 68)
  - Children who do stutter (n = 68)
  - Age: 3;04 – 8;11
- **Temperament** assessed via **CBQ**
- **Stuttering severity** assessed via **Stuttering Severity Instrument**
- **Length of therapy** was recorded for the CWS who had received treatment

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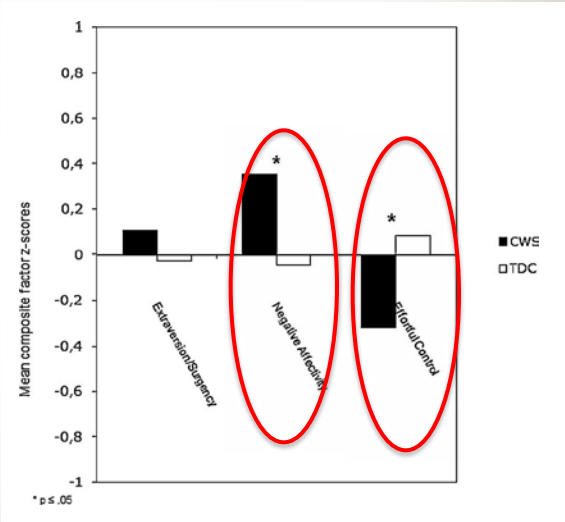
Results and Discussion: Composite Temperament Factors

- CWS, compared to CWNS, scored:
  - ↑ Negative Affect
  - ↓ Effortful Control
- Caveat: Composite factors provide broad overview in given areas



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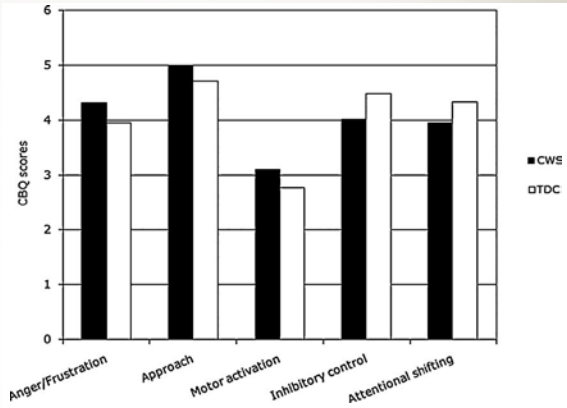
Results: CBQ Subscales

CWS, compared to CWNS, scored

- ***Higher*** on anger/frustration, approach, and motor activation
- ***Lower*** on inhibitory control and attentional shifting



- Eggers et al. speculate that these differences (composite and subscale factors) ***may be related to disorder progression as well as symptomology***

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Temperament relationship with therapy duration and stuttering severity

- There were no significant correlations between therapy duration and stuttering severity
- Caveats:
  - Treatment or type of treatment was not directly controlled in this study, conclusions are "tentative at best"
  - Emotional reactivity and regulation was not assessed immediately prior to, during, or preceding communicative situations in which stuttering frequency/severity was assessed

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Conclusions

- CWS, compared to CWNS, exhibit heightened negative reactivity and decreased regulation.
- Given that temperament is relatively stable over time, it may offer a way to capture pre-onset, contributing or triggering factors as opposed to purely representing reactions to stuttering
- ***Preliminary clinical implications, results:***
  - ***May validate the use of desensitization (when age appropriate) to reduce reactivity to stuttering or other stimuli***
  - ***Illustrate the use of parental guidance in working with young CWS***

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Article 3: Temperament, emotion, and childhood stuttering (Jones et al., 2014)

Temperament, Emotion, and Childhood Stuttering

Robin Jones, Ph.D.,[1] Dahye Choi, M.A.,[1] Edward Conture, Ph.D.,[1] and Tedra Walden, Ph.D.[2]

Jones, R. M., Choi, D., Conture, E., & Walden, T. (2014). Temperament, Emotion, and Childhood Stuttering. *Seminars in Speech and Language*, *35*(2), 114–131.

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***Research questions* assessing the role of temperament and emotion in childhood stuttering**

1. **Are there differences in temperament and emotion between CWS and CWNS?** (between-group comparisons)
2. **Are temperament and emotion associated with stuttering for CWS?** (within-group comparisons)
3. **Are temperament and emotion associated with developmental trajectories of childhood stuttering** (i.e., recovery vs. persistence)**?**

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1. Are there differences in temperament and emotion between CWS and CWNS?

Young CWS, compared to CWNS, exhibit:

- ***Higher*** *emotion reactivity* and *negative* affect
- ***Higher*** *ratings that speaking is difficult*
- ***Less*** environmental *adaptability*
- ***Less*** ability to *regulate* their attention and emotions
- ***Lower*** *parasympathetic activity* (physiological regulation) at rest

(e.g., Andeson et al., 2003; Clark et al., 2012; Karrass et al., 2006; Jones, Buhr et al., 2014; Ntourou et al., 2013)

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1. *Are there differences in temperament and emotion between CWS and CWNS during arousing conditions?*

Young CWS, compared to CWNS, exhibit:

- ***Increased*** *negative* affect in *frustrating* emotional condition
- ***Increased*** *sympathetic* activity during *positive* speaking condition
- ***Increased*** *cortical reactivity* during *negative* condition

(e.g., Johnson et al., 2010; Jones, Conture et al., 2014; Jones, Buhr et al., 2014; Zengin-Bolatkale et al., 2015)

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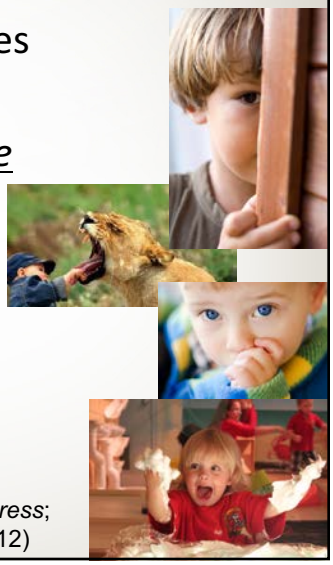
2. *Are temperament and emotion associated with stuttering for CWS?*

Young CWS's stuttered disfluencies are associated with:

- ***Increased*** *positive and negative* affect as well as *behavioral inhibition*
- ***Decreased*** *emotion* regulation
- Emotionally-arousing ***positive*** conditions



(e.g., Arnold et al., 2011; Choi et al., 2013; Choi et al., *in press*; Johnson et al., 2010; Jones et al., 2014; Walden et al., 2012)

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3. Are temperament and emotion associated with developmental trajectories of childhood stuttering (i.e., recovery vs. persistence)?

Young CWS exhibiting persistent stuttering, compared to CWS who recover and CWNS, exhibit:

Caregiver report (preliminary results)

- ***Lower*** *effortful control* at time point 1 (close to onset of stuttering)
- ***Increasing*** *negative affect* over the course of the longitudinal study

Physiological data (preliminary results)

- ***Increased*** *sympathetic reactivity* during a fast-paced picture naming task.

(e.g., Hitti et al., 2015; Zengin-Bolatkale et al., 2015)

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What we've learned…

- Taken together (caregiver report + behavioral observations + psychophysiology), empirical results suggest that temperament and emotion are associated with childhood stuttering.
- Relations are varied—there is NO ***one size fits all*** account of temperamental and emotional contributions to stuttering
  - Results are varied and depend on the measures (e.g., physiological vs. caregiver report) as well as the eliciting conditions (e.g., positive vs. negative)

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A few important considerations…

We are ***not*** suggesting that stuttering is associated with psychopathology***.***

These emotional processes discussed today are generally within the normal range for children in this age range.

We are suggesting that these processes likely contribute to childhood stuttering (e.g., may assist in the **expression of instances of stuttering** or contribute to **persistence of childhood stuttering**).

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Clinical recommendations: Temperament and childhood stuttering

- ***Goodness of fit*** between the child in treatment and the type of treatment
- Temperament as a predictor of ***treatment outcome***
- ***Promoting resilience*** in young children
  - e.g., behaviorally inhibited vs. uninhibited CWS

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"Goodness of fit"

- "Goodness of fit" results when the environmental expectations (e.g., parental performance requirements) are in accord with the child's expressed temperament (e.g., emotional vulnerability).
- Example: Indirect vs. Direct treatment for emotionally reactive vs. less reactive children
  - Caveat: Empirical studies are necessary prior making more firm recommendations
- An understanding of a child's temperament and his/her reaction to treatment may also inform the clinician's decision to adjust a treatment regimen when necessary (progress is not being made or relapse has occurred)

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Treatment outcome

- Based on temperamental characteristics, some CWS may be at:
  1. Greater risk for persistent stuttering
  2. Less able to benefit from the positive effects of treatment
- Richels and Conture assessed the utility of temperament in predicting short- and long-term treatment outcome

Richels & Conture (2010)

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Treatment outcome

- Results indicated that children with more expressive temperaments (i.e., lower levels of behavioral inhibition) exhibited the greatest decrease in stuttered and total disfluencies as a result of treatment.
- Clinically, SLPs may consider assessing temperament to predict treatment outcome and plan for therapy.

Richels & Conture (2010)

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Working with CWS and their families

- ***Temperament*** impacts and is impacted by ***resilience***.
- **Assessing behavioral inhibition** (one aspect of temperament to consider when working with CWS)
- ***Working with*** behaviorally inhibited and uninhibited CWS

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Resilience

- What is resilience?
  - The capacity of complex and dynamic systems to withstand and rebound from significant difficulty and/or distress.
  - Positive outcomes despite serious threat to adaptation or development.

(Masten, 2001; 2007; Chen, 2012)

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*How are temperament and emotion related to **resilience**?*

Temperament as a risk factor

- Impulsivity, inhibition, negative emotionality ***can*** serve as developmental risk factors

Temperament as a building block of resilience

- Self-regulation, sociability, task orientation ***can*** serve to increase children's resilience

However, all of these temperamental characteristics interact with the environment—there are things we can do to promote resilience!

(Wachs, 2006)

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- Temperament - The trait itself is not inherently a vulnerability or protective factor; the function arises in the interplay of individual and context. Masten, 2014

- Skills that promote resilience can be learned.

Seligman, 2007; Reivich & Shatté, 2002; RIRO, 2014

See "Reaching in…Reaching out" (http://www.reachinginreachingout.com) for resources and information on promoting resilience

After Pearson (2015), "Resilience Training…leveling the playing field" from Zebrowski et al., 2015 ASHA presentation.

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Behavioral Inhibition

- **Behavioral inhibition:** a temperamental characteristic that is expressed as initial avoidance, distress, or subdued emotion when a person is exposed to unfamiliar people, places, and situations (Kagan et al., 1984)

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Assessing Behavioral Inhibition

- **Behavioral Style Questionnaire** (BSQ; McDevitt & Carey, 1996)
- **Behavioral Inhibition:**
  - Temperament Characteristics Scale (e.g., Ntourou, Oyler, & Conture 2013)
  - Latency to the child's 6th spontaneous comment (e.g., Kagan, 1994; Choi et al., 2013)

After Kelly (2015), "Incorporating resilience strategies into stuttering therapy for children" from Zebrowski et al., 2015 ASHA presentation.

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Temperament Characteristics Scale

(TCS; e.g., Ntourou, Oyler & Conture, 2013)

- **Parent-completed** - Describe child from **birth to 4** years of age
- **7 items** scored from **1 to 5**; Totals range from **7-35**
  - Lower scores indicate higher levels of **behavioral inhibition** and higher scores indicate lower levels of behavioral inhibition or a more "outgoing" temperament
- Questions relate to:
  - Responses to **unfamiliar** people or situations
  - Heightened **fears** (or not)
  - **Reactions** to the environment or changes in it

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Results with Children Who Stutter (CWS)

(Ntourou, Conture, & Oyler, 2013)

- **Preschool CWS** score significantly lower on the TCS (i.e., **are more behaviorally inhibited**; BI) than do children who do not stutter (CWNS)

CWS	CWNS
19.72 (3.46)	24.6 (3.75)

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Promoting Resilience: What Helps?

- **Educate** parents about their children's temperament characteristics and implications.
- Help parents explore their **parenting styles**.
- Guide parents in identification of **stressors** and their implications for parent-child relations.

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Profile of Behaviorally INHIBITED Children

Children Who Stutter

- Slow-to-warm-up
- Does not respond well to **change**
- Builds tolerance for **novelty** slowly
- May **stutter more** when dealing with **novelty, change, or difference**
- Will **talk less** or even little in the clinical setting until comfortable

Children in General

- Under stress, inhibited children practice **avoidant coping** (e.g., expression of **negative emotions**; adult proximity seeking).
- **Parents** of shy, inhibited children are **less likely** to try **to promote** a sense of **independence** in their child, thereby increasing their child's inhibitory tendencies. (e.g., Wachs, 2006)

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Promoting Resilience in the Behaviorally INHIBITED CWS

- (Help parents) prepare him/her for "newness"
  - Start early
  - Take **small steps**
  - Follow the child's lead

Stuttering Foundation
www.stutteringhelp.org

- **Build rapport** (in therapy) before increasing "talking" demand
  - Comment rather than question (**"I wonder…"**)
  - Begin with "**side-by-side**" activities that don't require talking, thereby decreasing the emotional "stressor"
  - Gather data regarding **extra-clinic** talking and stuttering

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Profile of the Behaviorally UNINHIBITED CWS

- Doesn't know a "stranger"
- May **talk nonstop** without breaking for pauses or turns
- **Talks a lot** and stutters as he does so, taxing or **stressing** cognitive, linguistic and motor aspects of communication
  - Might this be why parents say "**slow down**" or "**take you time**"?

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Promoting Resilience: Behaviorally UNINHIBITED CWS

- Help parents **model** and teach child about **turn-taking** in conversation
  - Start with simple turn-taking game with **visual cues** (e.g., a microphone or object to hold)
  - Use movement (e.g., "musical chairs")
- Introduce "**thinking" pauses** before speaking
  - **Model pausing** to think before answering a question
  - Find "clues" and put them together before solving a word "puzzle"
- **Build** linguistic and conversational **complexity gradually** as child becomes better at pausing and taking turns

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Building Resilience: Balancing Reactivity and Self Regulation

- **Flexibly regulating emotion helps to "check" more extreme/inflexible reactivity.**
- How do we help young CWS do this?
  - **Addressing Reactivity**:
    - **Acknowledging**:
      - **Feelings**
      - Stuttering/talking **difficulties**
  - **Enhancing regulation**:
    - **Preparing for change**
    - "**Looking** before leaping"
    - **Pausing** before speaking
    - **Planning**/taking "**small steps**"

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Summary

- ***Temperament*** is an umbrella term for a constellation of individual differences in ***emotional reactivity*** and ***regulation*** that is expressed in the context of the environmental condition.
- ***Empirical results*** suggest that temperament and emotion are associated with childhood stuttering
- As clinicians, we can ***translate these findings*** to ***assessment*** and ***treatment*** and have a significant impact on children who stutter and their families

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QUESTIONS?

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