

Temperament, Emotion and Stuttering: Evidence, Assessment and Treatment



Photo of sculpture, wall of home in Dornbusch, Frankfurt am Main, Germany, Wikimedia Commons (alletemp.de)

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Friday October 19, 2018



<http://vkc.mc.vanderbilt.edu/childhoodstuttering/>

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Disclosures:

R. Jones & E. Conture

• DISCLOSURES

• Financial:

- Edward G. Conture has financial relations regarding thoughts/ideas/material from two of his published books which are included in the content of this October, 2018 Fullerton Fluency Conference, a cooperative offering from the Center for Children Who Stutter in collaboration with California State University (CSA), Fullerton and the California Speech-Language-Hearing Association.
- Robin M. Jones receives salary from Vanderbilt University Medical Center. Dr. Jones is also the principal investigator on grants that relate to the thoughts/ideas/material in this presentation from NIH/NIDCD and the Vanderbilt Kennedy Center.

• Non-financial:

- Both presenters - Edward G. Conture and Robin M. Jones - have non-financial relations with those publications they have (co)authored that are part of the content of this October, 2018 presentation to the Fullerton Fluency Conference, a cooperative offering from the Center for Children Who Stutter in collaboration with California State University (CSA), Fullerton and the California Speech-Language-Hearing Association.

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Where in the world is the
Vanderbilt Children's Stuttering
Project located:

South-Central USA; specifically
Nashville, Tennessee; and
housed in the Vanderbilt
University Medical Center
(VUMC) Bill Wilkerson Center
(VBWC)

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Learner Outcomes Friday 10/19/2018

1. After this course, participants will be able to define and describe temperamental characteristics as well as emotional processes from a theoretical as well as an empirical perspective.
2. After this course, participants will be able to describe a holistic model of developmental stuttering, including the possible contribution of temperament/emotion to developmental stuttering.
3. After this course, participants will be able to identify key findings (based on caregiver reports) from research on temperament and emotion in children who stutter.
4. After this course, participants will be able to identify some of the key aspects of assessment and treatment of childhood stuttering, with reference to individual differences in children's emotional/temperamental characteristics.

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I. INTRODUCTION: GENERAL, SPECIFIC PURPOSES AND OUTLINE

"...a varying effect may not be accounted for by reference to an unvarying cause" (Johnson, W. & Associates, 1959, p. 5)

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Motivation

To move the association between Temperament and Stuttering



From the realm of the *theoretical* to



The reality-based world of *fact*, empirical evidence, and clinical assessment and treatment

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General Purpose

- To provide evidence-base information about temperament in young children and its association to as well as implications for the diagnosis and treatment of childhood stuttering.



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Specific Purpose(s)

The **specific** purpose(s) of this presentation are as follows:

- Childhood stuttering: Definitions and descriptions:** What is it, who does it, how much do they do it, and some of the processes thought to cause it?
- Temperament, The construct:** A brief, selective **overview** of (a) the construct of temperament, (b) definitions and description, (c) relevant history, (d) relevant theory and (e) individual differences in emotion reactivity and regulation.
- Temperament, Evidence:** Review of recent empirical **evidence** and theoretical perspectives on the role of temperament in childhood stuttering.
- Assessment of childhood stuttering:** A **synopsis** of **assessing** childhood stuttering, including measurement of temperamental processes
- Treatment of childhood stuttering:** A **synopsis** of one time-tested **treatment** approach to children, including consideration of children's temperamental characteristics

Key acronyms:

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



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Outline: Temperament and Stuttering Friday 10/19/2018

- I. GENERAL AND SPECIFIC PURPOSES
- II. DEFINITIONS AND DESCRIPTION OF CHILDHOOD STUTTERING
- III. DEFINITIONS AND DESCRIPTION OF EMOTION, TEMPERAMENT, EMOTIONAL REACTIVITY AND REGULATION
- IV. TEMPERAMENT: A VERY BRIEF HISTORY
- V. POSSIBLE RELATIONS AMONG EMOTION, TEMPERAMENT, AND STUTTERING
- VI. ROTHBART'S (2011) THREE TEMPERAMENTAL FACTORS AND RELATED 15 (MEASURABLE) SCALES
- VII. TWO MODELS OF CHILDHOOD STUTTERING INVOLVING EMOTIONAL/TEMPERAMENTAL PROCESSES
- VIII. RESEARCH FINDINGS (2003-2018) RE TEMPERAMENT AND STUTTERING: AN ORIENTATION TO OUR MULTI-METHOD APPROACH
- IX. RESEARCH FINDINGS (2003-2018) RE TEMPERAMENT AND STUTTERING: EVIDENCE FROM CAREGIVER REPORTS
- X. SYNOPSIS OF ASSESSMENT OF CHILDHOOD STUTTERING
- XI. SYNOPSIS OF TREATMENT OF CHILDHOOD STUTTERING
- XII. SELECTED REFERENCES

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Okay, what is this presentation about?

- First, childhood stuttering
- Second, theory and evidence regarding emotion and temperamental processes in young children
- Third, theory and evidence that **emotion and temperament** (both to be subsequently defined in this section) may or may not be **associated with childhood stuttering**
- Fourth, how during the process of assessing/diagnosing childhood stuttering clinicians may consider and measure children's emotion and temperament

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Possible association of temperament, emotion and stuttering

Stuttering is known to change over time, within and between situations.



Emotion also changes over time, within and between situations.



Therefore, changes in emotion may be associated with changes in stuttering.

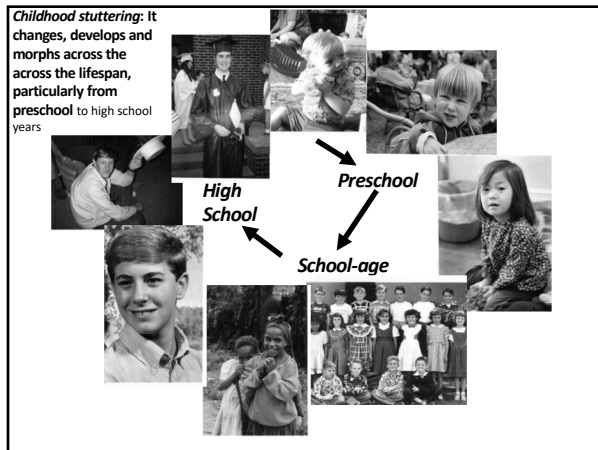
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II. DEFINITIONS AND DESCRIPTION OF CHILDHOOD STUTTERING

...a varying effect may not be accounted for by reference to an unvarying cause" (Johnson, W. & Associates, 1959, p. 5)

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Childhood Stuttering

What is It?

- Stuttering = a developmental communication disorder where the forward flow of speech is disrupted or broken, resulting in:
- Repetitions of sounds/syllables (“li-li-li-like this”),
- Repetitions of single-syllable words (“I-I-I like this”)
- Prolongations (“Iillike this”), or
- Abnormal stoppages (no sound) on sounds and syllables.
- Unusual facial and body movements may associated with or occurring before, during and/or after instances of stuttering

Persistence, prevalence, incidence, and impact of Childhood Stuttering

Childhood Stuttering: Persistence: Comes and goes for some (recover) and for others comes and stays (persists) ~70-80% of children “grow out of stuttering”

Childhood Stuttering, Prevalence: Approximately 1% prevalence among young children.

Childhood Stuttering, Incidence: Approximately 5% incidence, that is, stuttering occurring sometime during the life span.

Childhood Stuttering, Impact: Significantly impacts children’s academic, emotional, and social abilities as well as their later vocational potential and achievements

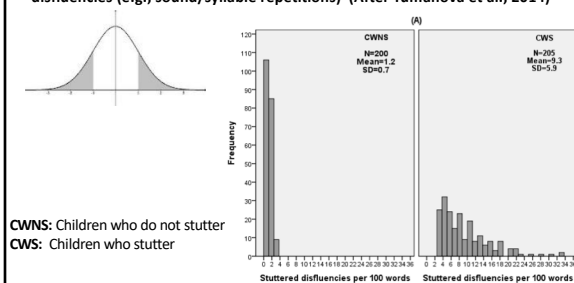
Some basic info about Childhood Stuttering

- Onset of stuttering: Starts in childhood and develops over time.
- Variability of Stuttering: Variable but not random: its occurrence varies from sentence to sentence but tends to occur at certain places within an utterance, especially the beginning.
- Gender and Stuttering: More apt to occur boys than girls (3 boys for 1 girl on average, closer to 2 boys for 1 girl below 3 years of age)
- Genetics and Stuttering: Runs in families, just as does depression, ADHD, temperament, etc.; however, the “genetic roots” of stuttering are not simple like eye or hair color.



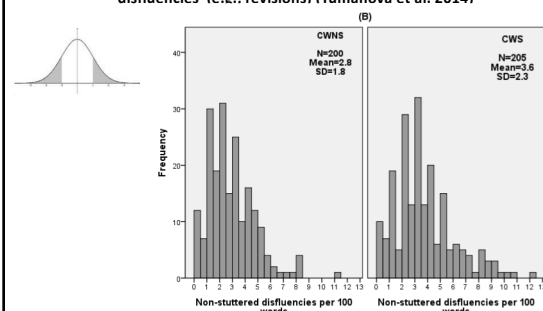
What is the average and range of stuttered disfluencies exhibited by preschool-age children?

As expected, preschool-age CWS and CWNS significantly differ re stuttered disfluencies (e.g., sound/syllable repetitions) (After Tumanova et al., 2014)



What is the average and range of non-stuttered disfluencies exhibited by preschool-age children?

Less expected, CWS and CWNS also significantly differ re non-stuttered disfluencies (e.g., revisions) (Tumanova et al. 2014)



Childhood Stuttering:
What is its associated non-speech, physical concomitant or accessory behaviors? And what could these events be related to?

(1) **Motoric Overflow?**



Photos after Conture & Kelly (1991), *Journal of Speech and Hearing Research*.

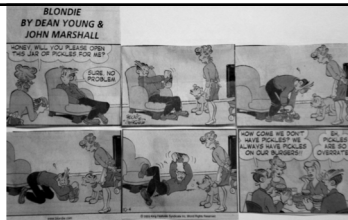
(2) **Cognitive/Linguistic planning?**

(3) **Emotional Reaction?**



Or, (4) **Some combination of (1), (2), and/or (3)?**

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Polyolith vs. Monolith

More than one variable contributes: First thing we're guessing is that more than one variable contributes to the "cause" of stuttering and that such variables more than likely interact among each other

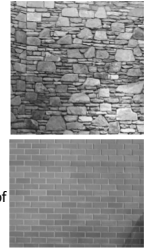
Causal Matrix: Second thing we're guessing, is that we talking about a **causal matrix** or **causal nexus** rather than a **one-size-fits-all cause**



Polyolith: The "cause" is probably more like a **polyolith**, e.g., a wall made of **stones** of differing weights, shapes, colors and material, with no one-size-likely-to-fit-all.

Versus

Monolith: The "cause" is less likely to be a **monolith**, or a wall made of one size, weight, shape, color and material, with one-size-likely-to-fit-all



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Assumption 1: The "distal" causes of stuttering most likely involve those that are (1) inherited (genetic) (2) environmental (experiential), and (3) represent interactions between (1) and (2)*

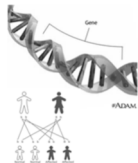
Kraft, S. J. & Yairi, E. (2011). The genetic basis of stuttering: State of the art, 2011. *Folia Phoniatr Logop.*, 64(1): 34-47.

Starkweather, C. (2002). The epigenesis of stuttering. *Journal of Fluency Disorders*, 27, 269-288.

(1) **Environmental (experiential)**

(2) **Inherited (genetic)**

(3) **Interactions between (1) & (2)**

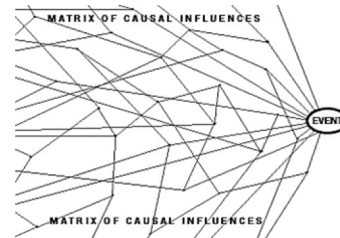


*Schuijs, M., Willart, M., Vergote, K., Gras, D., Deswarte, K., Ege, M., et al. (2015). Farm dust and endotoxin protect against allergy through A20 induction in lung epithelial cells. *Science*, 349, pp. 1106-1110

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Assumption 2: When we are talking about "the cause" of stutter, I believe we are talking plural (causal matrix) rather than singular (cause)

Weber-Fox, C. & Smith, A. (2014). Update from Purdue. *The Stuttering Foundation*, Summer 2014, pp. 1, 16

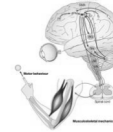


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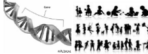
Assumption 3:

We assume genetics and/or experience impact most commonly discussed causal contributors to stuttering, with all such contributors involving the brain, at least at some point in the process.

Speech Motor



Genetics + Experience



Cognitive/Linguistic



Emotion



Learning



Choleric Melancholic Sanguine Phlegmatic



Delayed undelayed

Time

Time

Time

Time

Time

Time

Time

Time

Time

Time

Time

Time

Time

Time

Time

Time

Time

Time

Time

Time

Time

Time

Time

Beal, D., Lerch, J., Cameron, B., Henderson, R., Gracco, V., DeNil, L. (2015). The trajectory of gray matter development in Broca's area is abnormal in people who stutter. *Front. Human Neuroscience*, 9: 89, PMID: PMC4347452

Chang, SE & Zhu, D. (2013). Neural network connectivity differences in children who stutter. *Brain*, 136, 3709-3726.

Chang, SE, Zhu, D., Choo, A., & Angstadt, M. (2015). White matter neuroanatomical differences in young children who stutter. *Brain*, 138, 694-711.

These temperamental proclivities serve to **actively filter** one's experiences/environment

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III. DEFINITIONS AND DESCRIPTION OF EMOTION, TEMPERAMENT, EMOTIONAL REACTIVITY AND REGULATION

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Temperament (an umbrella term for a constellation of individual differences): Definition

Temperament (English) the word:

- Comes from **temperamentum** (Latin) or "mixture", which comes from *temperare* or "mingle in due proportion"
- Conture E., Kelly E., Walden T. (2013). Temperament, speech and language: An overview. *Journal of Communication Disorders*, 46, 46 125–142. .PMCID: PMC3630249
- Kefalianos, E., Onslow, M., Block, S., Menzies, R., & Reilly, S. (2012). Early stuttering, temperament and anxiety: Two hypotheses. *Journal of Fluency Disorders*, 37, 151-163.

Temperament the definition:

- Temperament:** "Constitutionally (biologically) based individual differences in reactivity and self-regulation" (Rothbart & Derryberry, 1981) as cited by Rothbart (2011), p. 5
- Temperamental "...refers to stable individual differences that **appear from birth onward** and that presumably **have a strong genetic and neurobiological basis**." (Mervielde & De Pauw (2012). In Zentler & Stinner (Eds.) *Handbook of Temperament*. New York: The Guilford Press, p. 23).

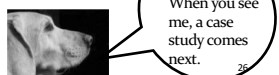


Choleric Melancholic Sanguine Phlegmatic

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Temperament defined: Cont'

- "...individual differences in **emotional, motor, and attentional reactivity** ...and **self-regulation**" (p. 207) (Rothbart & Derryberry, 1981) as cited by Rothbart (2007)
- "These tendencies are:
 - biologically based**
 - linked to an individual's **genetic endowment**" (p. 207) (Posner, Rothbart, & Sheese, 1981, as cited by Rothbart, 2007), and,
 - not continually expressed,** but "**... dependent on the appropriate eliciting conditions, that is, the content of situations**" (Rothbart, 2011, p. 14).



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Video "case study" examples of a:

Relatively non-talkative child

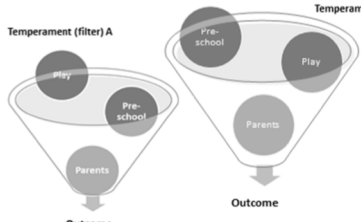
versus

Relatively talkative child

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Assumption 4: We assume that children's temperament actively filters their environment

"...children's lives are experienced only as they are filtered through the individual child's nervous system, so that an environmental event is not the same for all." (Rothbart, 2011, p. 30, explaining Escalona's (1968) notion of "effective experience")



Conture, E., Kelly, E., & Walden, T. (2013). Temperament, speech and language: An overview. *Journal of Communication Disorders*, 46(2), 125–142. .PMCID: PMC3630249

"Nearly all temperament theories presume a **biological basis** to individual differences in early appearing, enduring behavioral tendencies considered to be temperamental." Saudino (2005)

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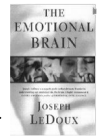
Emotion defined

- "**Emotion** is 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. (1996). *The emotional brain*. New York: Simon & Schuster.

LeDoux, J. (2015). *Anxious: Using the brain to understand and treat fear and anxiety*. New York: Viking



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Emotion Reactivity and Regulation: Definition

Emotion REACTIVITY:

- Reactivity:** Disposition to emotional, motor and attentional reactions
- Measured/observed by:** Latency to reaction, reaction intensity (e.g., peak intensity), duration of the reaction
 - For example, caregiver report of negative affect, coded behavior observation of negative affect, and physiological measure of sympathetic activity

Emotion (SELF)REGULATION:

- Self-regulation:** Processes that act on reactive tendencies, increasing or moderating them
- Measured/observed by:** Intensity, direction (i.e., increase vs. decrease), and duration of regulatory response
 - For example, caregiver report of effortful control, coded behavior observation of attention regulation (e.g., shifting away from stimulus), and physiological measure of parasympathetic activity

Emotional Reactivity and Regulation: *Measurement*

- Measures may be based on:
 - Caregiver reports**, e.g., Children's Behavior Questionnaire (CBQ)
 - Coded behavior observation** of positive/negative reactivity or attention regulation (e.g., shifting away from stimulus, number or duration of regulatory attempts), and/or
 - Psychophysiology**: Measures of sympathetic and parasympathetic nervous system activity
 - Cortical Activity**, e.g., Late Positive Potential
- Each of these sources of evidence can be measured by means of latency, intensity, frequency, and/or duration of reactive or regulatory behaviors/processes

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IV. TEMPERAMENT: A BRIEF HISTORY

...a varying effect may not be accounted for by reference to an unvarying cause" (Johnson, W. & Associates, 1959, p. 5)

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Temperament: *A Brief History* (3 slides adapted from Rothbart, 2011)



Choleric Melancholic Sanguine Phlegmatic

Galen (2nd Century): Observed consistent differences in infants and young children, leading him to argue that children differ from one another from their earliest days

Vindician (4th Century physician) fourfold typology:

- Choleric**: Touchy, aggressive and active (predominance of yellow bile)- Characters played by **Joe Pesci**
- Melancholic**: moody, tendency to fear and sadness (predominance of black bile)-Characters played by **Woody Allen**
- Sanguine**: Sociable and easygoing (predominance of blood)-**Bill Clinton**
- Phlegmatic**: Calm, even tempered and slow to emote (predominance of phlegm) – **Labrador Retriever**

Temperament: *Brief History Cont'*

Twentieth Century

– Holland:

- Heyman and Wiersma (1906): Three broad factors (antedate Rothbart's: surgency (activity), negative affect (emotivity) and primary-secondary function (effortful control):
- Activity**: Express or act out what is thought or desired
- Emotivity**: Show bodily symptoms, to be fearful or shy
- Primary-Secondary Function**: React immediately versus postponed,

– USA

- Cattell (1957) discusses notion of "**press**" (situational dependency): The extent to which the environment creates a press upon (i.e., tends to elicit) those characteristics
- If there is no "press" for fear, the trait of fearfulness will not be relevant to the situation (Rothbart, 2011, p. 26)
- Evidence of temperamental disposition requires: **Press + Disposition**
- The potential for expression of the disposition exists regardless of whether situations press for the trait

In 2018, what do we know, about temperament, especially that of children?

- Temperament appears to be a **biological/constitutional** set of behaviors/proclivities, that are there from birth, but are "open" to environmental influences.
- The way that people behave and react to situations is influenced in part by their temperament.
- Children's temperament influences:
 - their **level of activity**
 - their level of fear, frustration, sadness and discomfort
 - how **readily they approach** new people and situations
 - their ability to **pay attention**, focus on and complete a task, and manage impulses
 - their **social competence** and mental health

Centre of Excellence for Early Childhood Development Strategic Knowledge Cluster on Early Child Development; Website: www.excellence-earlychildhood.ca

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V. POSSIBLE RELATIONS AMONG EMOTION, TEMPERAMENT, AND STUTTERING

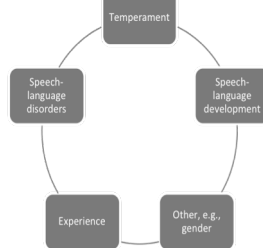
"What is life without a dream?" (Rostand, 1895)
"What is research, without a theory?" (Conture, 2001).

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Relation of temperament to other processes:

Based on current findings: Temperament, emotion, and emotion reactivity and regulation **interact with** children's experience, speech-language development/disorders, and other variables, for example, gender.

The number and nature of such interactions remain unclear, but basic and applied research findings are providing increased clarity.



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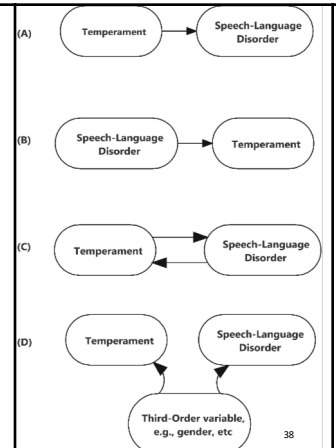
Directionality of Effect:

(A) **Causal:**
Temperament causes Stuttering

(B) **Consequential:** Temperament
consequence of stuttering

(C) **Bi-directional:**
Temperament impacts
stuttering and stuttering
impacts temperament

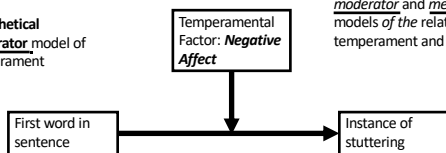
(D) **Correlation:**
Temperament related
to stuttering through
a third variable (e.g., gender,
maternal education)



After Conture, Kelly & Walden
(2013).

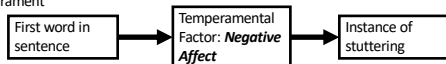
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Hypothetical
Moderator model of
temperament



HYPOTHETICAL examples of
moderator and *mediator*
models of the relation between
temperament and stuttering

Hypothetical
Mediator model of
temperament



Theory: (1) Social-, (2) Bio-psychological or (3) Their Bi-directional
Interaction

• **Social-oriented Theory - Child *Passive***

- "...environmental influences were seen as almost entirely responsible for personality differences, especially the child's history of rewards or punishments" (Rothbart, 2011, p. 30)...individual differences thought almost entirely related to parental rewards and punishment



• **Biological-oriented theory - Child *Active***

- Effective Experience (Escalona, 1968): "...events in children's lives are experienced only as they are filtered through the individual child's nervous system, so that the environmental event is not the same for all" (Rothbart, 2011, p. 30)...individual differences thought mainly related to constitution or biology
- In large part, researchers into temperament, especially early researchers, were "...reacting against the idea that individual differences were solely the result of parental influences" (Rothbart, 2011, p. 35)
- Interaction between bio-psychological and social forces: *Child Active and Passive* (bi-directional middle ground)
- Influence of socialization is bidirectional...variations in children's behavior elicit differences in parents and teachers behavior and attitudes which influence child's behavior which...

How is any of the above associated with stuttering?

- First, all humans have a temperament.
- Second, all people who stutter, including preschool-age CWS, are humans
- Therefore, CWS have a temperament not because they stutter, but because they are human.
- The issue, therefore, is not whether CWS, at or near the onset of stuttering, **have** a temperament (because **all** CWS [and CWNS] DO have a temperament)
- Instead, the issue is whether: ***CWS's temperament is associated with the onset, exacerbation and/or maintenance of their stuttering***

One way to think about association between Emotional Reactivity (arousal) & Emotional Regulation (coping): **Adaptive** Outcomes

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

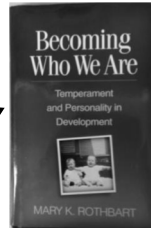
"My point is, life is about balance. The good and the bad. The highs and the lows. The pina and the colada." – Ellen DeGeneres

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Temperament: One modern-day, widely-cited Model (Rothbart, 2011)

- For purposes of this talk, we've selected:
- Rothbart's (2011) psycho-biological model of temperament, because of its:
 - (1) inclusiveness,
 - (2) currency,
 - (3) empirical support and
 - (4) frequent citations within the literature regarding temperamental contributions to childhood development
- Our talk will focus on *preschool-age children*, the age group when stuttering begins for the vast majority of people who stutter

Excellent overview/review of temperament: Rothbart, M. (2011). *Becoming Who We Are: Temperament and Personality in Development*. New York: The Guilford Press.



One other thing about *temperament*: Temperament is related to *personality* but it is not personality.

- "Temperament and experience together 'grow' a personality" (Rothbart, 2007 p. 207).

Rothbart, M. (2007). Temperament, development and personality. *Current Directions in Psychological Science*, 16, 207–212.

- "As such, the resulting *personality* reflects the person's cognitions about others, self and the physical and social world, including variables such as attitudes and values." (Conture, Kelly & Walden, 2013).

Conture, E., Kelly, E., & Walden, T. (2013). Temperament, speech and language: An overview. *Journal of Communication Disorders*, 46, 125-142. PMID 23273707

VI. ROTHBART'S (2011) THEORY OF TEMPERAMENT, ITS THREE FACTORS AS WELL AS RELATED 15 (MEASURABLE) SCALES

"...THE CHILD'S EFFECTIVE EXPERIENCE...HER [SYBIL ESCALONA'S] IDEA WAS THAT EVENTS IN CHILDREN'S LIVES ARE EXPERIENCED ONLY AS THEY ARE FILTERED THROUGH THE INDIVIDUAL CHILD'S NERVOUS SYSTEM, SO THAT AN ENVIRONMENTAL EVENT IS NOT THE SAME FOR ALL" (ROTHBART, 2011, P. 30)

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Employing factor analysis, Rothbart et al (2001) reported three unobserved variables - called factors - that describe variability among a larger number of observed, correlated variables

The resulting test Children's Behavior Questionnaire (CBQ) (Rothbart et al., 1994; 2001) is a validated caregiver-rating report, with various forms differing in numbers of questions.

Reactivity



Negative (Negative Affect)



Positive (Surgency)

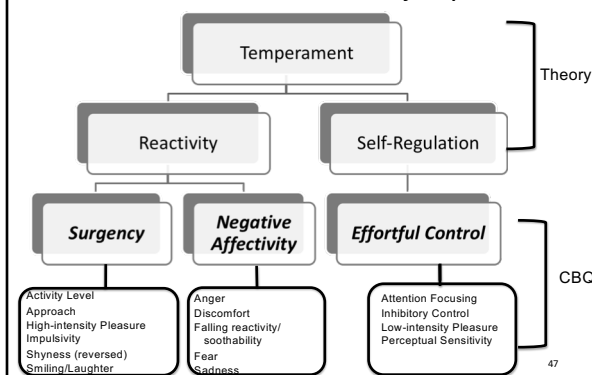
Regulation



Effortful Control

46

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)



- Negative affect:** fear, angry, frustration, discomfort, sadness and slowness to recover from distress



- Effortful control:** inhibitory control, attention focusing, low-intensity pleasure, and perceptual sensitivity.



Caregiver report studies:
Some selected, norm-based tests of
temperament/emotional reactivity and regulation:

- *Behavioral Style Questionnaire (BSQ)*: McDevitt, S & Carey, W. (1978). The measurement of temperament in 3-7 year old children. *Journal of Child Psychology, Psychiatry and Allied Disorders*, 19, 245-253; Psych. Corp., 19500. ORDER: www.b-di.com

- *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).

- *CCS*: Eisenberg, N. et al. [1993]. The relations of regulation and emotionality to preschoolers' social skills and sociometric status. *Child Development*, 64, 1418-1438).

- *Short Behavioral Inhibition Scale (SBIS)*: Oyster, 1996; Ntouriou, Oyster, Conture, & Walden, 2018).



Zach and
Nick are
next

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**Parent's description of
temperamentally-related
behaviors of their twin sons:
Zach and Nick**

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**Takeaway messages from parents description of their
two twin son's (Zach and Nick)
temperamentally-related behaviors**

Zach (blue):

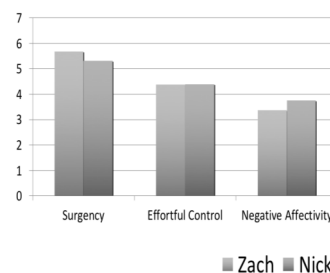
- Laid back
 - Easy going
 - Adaptable
- Outgoing
- Distractible
 - Attention diverted in 5 minutes
- Less inhibited
- Funny
 - Happy-go-lucky

Nick (red):

- Intense
 - 100% all day every day
- Does everything fast
 - Moves fast
 - Talks fast
- Hyper-focused
 - Hears nothing around him
 - Stays with what he's doing
- Verbal
 - Often
 - Early

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**Zach and Nick's Emotional Reactivity and Regulation
from their parent's report on the Children's Behavior Questionnaire (CBQ)**



- **Surgency/Extraversion:**
 - Positive Emotionality
 - Activity
- **Effortful Control:**
 - Attentional Control
 - Inhibitory Control
 - Activational Control
- **Negative Affectivity:**
 - Negative Emotions

(e.g., Rothbart, 2011; Full-Scale CBQ)

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Our two - 1 early (2006) and 1 more recent (2012) - **models** of emotion, temperament and childhood stuttering

**VII. CHILDHOOD STUTTERING AND
EMOTIONAL/TEMPERAMENTAL
PROCESSES: TWO MODELS**

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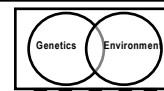
53

**Model 1:
Communication-
Emotional Model of
Stuttering**

One theoretical account of childhood stuttering (Conture et al., 2006) that suggests that **emotional reactivity**, **emotional regulation** and **their interaction** are associated with the onset and the development of childhood stuttering.

DISTAL

CONTRIBUTORS

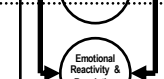


PROXIMAL

CONTRIBUTORS



EXACERBATION



OVERT BEHAVIOR



After Conture, E., Walden, T., Arnold, H., Graham, C., Karrass, J., & Hartfield, K. (2006). Communicative-emotional model of stuttering. In N. Bernstein Ratner (Ed). *Stuttering: New Research Directions* (pp. 17-45). Mahwah, NJ: Erlbaum.

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IX. RESEARCH FINDINGS (2003-2018) RE TEMPERAMENT, EMOTION AND CHILDHOOD STUTTERING: EVIDENCE FROM CAREGIVER REPORTS

"...while parent report measures do contain some subjective parental components, available evidence indicates that these measures also contain a substantial objective component that does accurately assess children's individual characteristics" (Henderson & Wachs, 2007, p. 402).



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Example CBQ subscale questions for caregivers

- "Is very difficult to soothe when s/he becomes upset"
- "Likes to go high & fast when pushed on a swing"
- "Is slow & unhurried in deciding what to do next"

Reactivity



Negative (Negative Affect)



Positive (Surgency)

Regulation



Effortful Control

62

Caregiver report studies: Some selected, norm-based tests of temperament/emotional reactivity and regulation:

- **Behavioral Style Questionnaire (BSQ):** McDevitt, S & Carey, W. (1978). The measurement of temperament in 3-7 year old children. *Journal of Child Psychology, Psychiatry and Allied Disorders*, 19, 245-253; Psych. Corp., 19500. ORDER:: www.b-di.com
- **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).
- **CCS:** Eisenberg, N. et al. [1993]. The relations of regulation and emotionality to preschoolers' social skills and sociometric status. *Child Development*, 64, 1418-1438).
- **Short Behavioral Inhibition Scale (SBIS):** Oyster, 1996; Ntourou, Oyster, Conture & Walden, 2018).

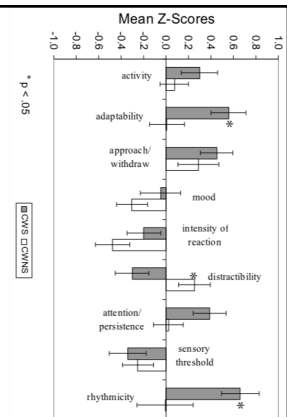
63

BSQ Caregiver Report (Cross-Sectional):

Question: Do CWS ($n = 31$) differ from CWNS ($n = 31$) regarding temperamental characteristics measured using the Behavioral Style Questionnaire (BSQ)?

Answer: Yes, for some temperamental characteristics. They were less adaptable to change, hypervigilant (i.e., less distractible), and less rhythmic in daily routines (i.e., irregular biological functions).

(Anderson, Pellowski, Conture, & Kelly, 2003)

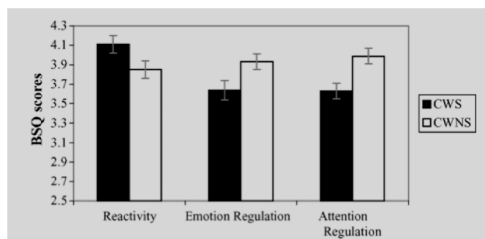


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BSQ Caregiver Report (Cross-Sectional):

Question: Do CWS ($n = 65$), compared to CWNS ($n = 56$), differ in emotional reactivity, emotion regulation, and attention regulation measures derived from the BSQ?

Answer: Yes. CWS exhibited higher emotional reactivity, lower emotion regulation, and lower attention regulation.



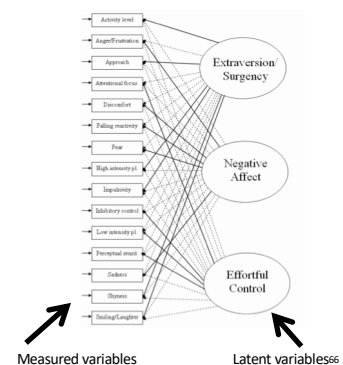
(Karras, Walden, Conture, Graham, Arnold, Hartfield, & Schwenk, 2006).

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CBQ Caregiver Report (Cross-Sectional): Association between "Measured" and "Unobservable" (latent) variables from the CBQ



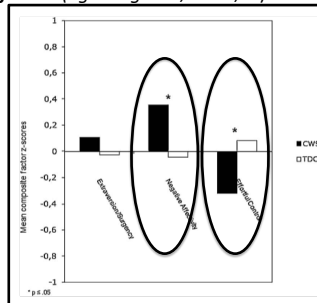
(Eggers, 2012). *Temperamental characteristics of children with developmental stuttering: From parent questionnaire to neuropsychological paradigms*. (Doctoral thesis, Katholieke Universiteit, Leuven, Belgium and Tilburg University, Tilburg, The Netherlands). Retrieved from https://iris.kuleuven.be/bitstream/123456789/350447/1/Thesis_Eggers_dru_inroef.pdf



CBQ Caregiver Report (Cross-Sectional):

Question: Do CWS ($n = 68$) differ from CWNS ($n = 68$) regarding composite temperamental factors (age range = 3;04 – 8;11)?

Answer: Yes. CWS exhibit greater reactivity (i.e., negative affect) and lower emotional regulation (i.e., effortful control)



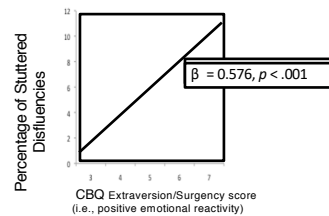
(Eggers, De Nil, & Van den Bergh, 2010)

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CBQ Caregiver Report (Cross-Sectional):

Question: Is positive emotional reactivity associated with more stuttering for CWS ($n = 47$), across all conditions (neutral, positive, negative emotion)?

Answer: Yes. CWS's positive reactivity is positively correlated with their stuttering frequency across all conditions



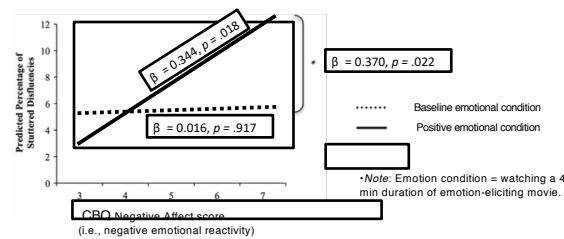
(Choi, Conture, Walden, Jones & Kim, 2014)

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CBQ Caregiver Report (Cross-Sectional):

Question: Is negative emotional reactivity associated with more stuttering for CWS ($n = 47$) in a positive when compared to a neutral emotion condition?

Answer: Yes. CWS with higher negative emotional reactivity exhibit more stuttering during a narrative after a positive, compared to a neutral, emotionally arousing condition.



(Choi, Conture, Walden, Jones & Kim, 2016)

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Does temperament impact other aspects of CWS's speech and language (e.g., vocabulary)?

The following study investigated the relation between vocabulary and temperament in young children who stutter

(1) Standardized speech-language tests**(2) Caregiver reports of temperament**

Children's Behavior Questionnaire:



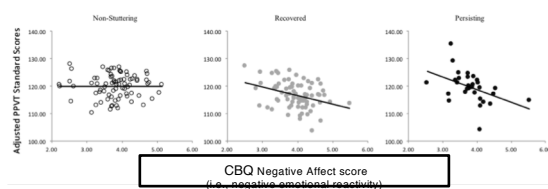
Effortful Control

Surgency

Negative Affectivity

CBQ Caregiver Report (Longitudinal):

Question: Does the association between emotional reactivity and receptive vocabulary differ between talker groups?



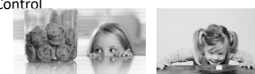
Answer: Yes. Both CWS-persisting and CWS-recovered differed from CWNS in the relation between emotional reactivity and receptive vocabulary.

(Singer et al., under review)

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What have we learned from caregiver reports?

- Compared to CWNS peers, CWS exhibit:
- Greater Reactivity**
 - More Emotional Reactivity, Negative Affect and Extreme Behavioral Inhibition
- Lesser Regulation**
 - Less Attentional and Emotional Regulation as well as Inhibitory Control
- Negative affect relates to receptive vocabulary**
 - Compared to CWNS, CWS-Recovered and CWS-Persistent exhibit a inverse relation between negative affect and receptive vocabulary



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**Parting thoughts: recommendations:
Emotion reactivity, regulation, and childhood
stuttering**

- **Much more information is needed regarding:**
 - The relation between **emotion reactivity** and **regulation** and the impact this relation has on stuttering.
- **Consider that:**
 - **Emotion regulation** may be one key piece to the puzzle, that is, our attention to reactivity may make us overlook regulation (over or under), to the detriment of effective diagnosis and treatment.
 - ALL forms of **self-control/self-regulation** (e.g., dieting, anger management, persistence) "draw on a common resource" (Muraven & Baumeister, 2000) – possibly glucose – which is of limited supply and can be readily depleted
- **The child's effective experience:**
 - "Her (Sybil Escalona's) idea that events in children's lives are experienced only as they are filtered through the individual child's nervous system so that an environmental event is not the same for all" (Rothbart, 2011, p. 30)

***X. SYNOPSIS OF ASSESSMENT OF
CHILDHOOD STUTTERING,
INCLUDING REFERENCE TO
TEMPERAMENT AND EMOTION***

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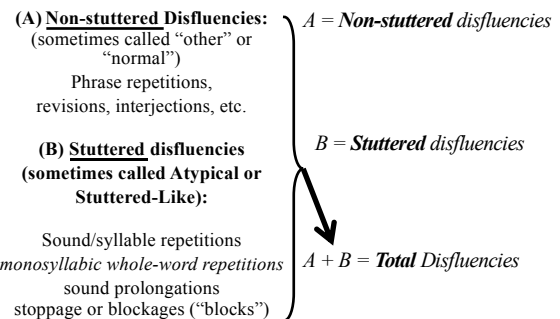
**Some Basic Goals of Stuttering
Assessment**

- Does the person stutter?
- How is the stuttering affecting communication? Family? Social interactions outside home/school? Behavioral management?
- Is the stuttering likely to be transient or chronic? [for children]
- Is therapy indicated?
 - If so, what type of approach is best?

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Types of Speech Disfluency



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Initial Evaluation

Speech/Language Sample:

- family
- clinician
 - free play/ conversation
 - Alter response demands (e.g., TOCS; reading vs. speaking)



**Speech/Language
Testing:**

- **Stuttering** (e.g., SSI; TOCS)
- **Language**
- **Phonology**
- **Self-perceptions** (e.g., KiddyCAT; CAT-R; CAI; LCB)
- **Oral-Motor**
- **Temperament** (e.g., SBIS, CBQ-VSF)
- **Other**

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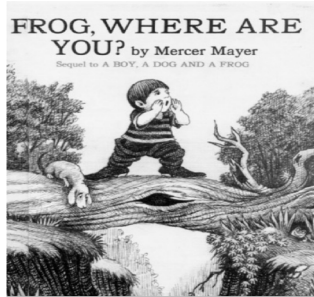
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***Selected Assessment Tools re SPEECH,
LANGUAGE & HEARING:***

- **Receptive vocabulary:** Peabody Picture Vocabulary Test (PPVT)
- **Expressive vocabulary:** Expressive Vocabulary Test (EVT)
- **Receptive & expressive language:** Test of Early Language Development (TELD)
- **Conversational language usage:** Mean Length of Utterance (MLU)
- **Articulation:** Goldman-Fristoe Test of Articulation (GFTA) & Phonology: Khan-Lewis Phonological Analysis (KLPA)
- **General & oral motor functioning** (if possible, history of first year of life, especially transition from bottle/breast to sippy cup and then sippy cup to regular cup)
- **Hearing abilities:** Pure tone screen & tympanometry



**For pre-literate/pre-reader children:
Narrative, e.g., Wordless Storybook (FWAY)**



Berman, R. & Slobin, D. (1994). *Relating events in narrative: A crosslinguistic developmental study*. Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers

**Selected Assessment Tools re
STUTTERING:**

Behavior:

- **Stuttering Severity Instrument (SSI)**
www.mayer-johnson.com
- **Test of Childhood Stuttering (TOCS)** www.mayer-johnson.com/TOCS
 - Tumanova, V., Choi, D., Conture, E. G., & Walden, T. A. (2018). Expressed parental concern regarding childhood stuttering and the Test of Childhood Stuttering. *Journal of Communication Disorders*, 72, 86-96.

Feelings/Thoughts/Cognitions:

- **Communication Attitude Test for Preschool & Kindergarten Children Who Stutter (KiddyCAT)**
www.pluralpublishing.com/publication_kiddycat.htm
- **Children's Attitudes About Talking (CAT-R)**
• Denil & Bruten (1991). *Journal of Speech and Hearing Research*
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**Selected Assessment Tools re
Temperament/Emotional Reactivity and Regulation:**

- **Behavioral Style Questionnaire (BSQ):** McDevitt, S & Carey, W. (1978). The measurement of temperament in 3-7 year old children. *Journal of Child Psychology, Psychiatry and Allied Disorders*, 19, 245-253; Psych. Corp., 19500. ORDER:: www.b-di.com
- **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).
- **CCS:** Eisenberg, N. et al. [1993]. The relations of regulation and emotionality to preschoolers' social skills and sociometric status. *Child Development*, 64, 1418-1438).
- **Short Behavioral Inhibition Scale (SBIS):** Oyler, 1996; Ntourou, Oyler, Conture, & Walden, 2018).

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**CBQ-VSF (Very
Short Form):**



Negative Affectivity

- **Parent-report**
- **Age Range:** 3 months through Adult
- **Items:** 36
- **Forms:** Parent; Teacher
- **7-point scale** (1=extremely untrue of your child; 7 = extremely true of your child)
- **Examples:**
 - "Is slow & unhurried in deciding what to do next"
 - "Likes to go high & fast when pushed on a swing"
 - "Is very difficult to soothe when s/he becomes upset"

HOW CAN I OBTAIN THE ROTHBART TEMPERAMENT MEASURES (E.G., CBQ) ? INFO BELOW TAKEN FROM:

<https://research.bowdoin.edu/rothbart-temperament-questionnaires>

We do not charge researchers to use our temperament measures. Dr. Rothbart believes that the free exchange of scientific information is essential to research improvement. Access permission to the questionnaires can be repaid by sharing with us the results of your studies.

To request access to the questionnaires, please complete and submit the request form, providing your email, name, institutional affiliation, and a brief description of your intended study, including age ranges and which questionnaire(s) you plan to review or use. Sam's email reply will arrive within 48 hours and provide access codes and information on how to obtain copies of the measures.

You may also contact Sam Putnam by email at sputnam@bowdoin.edu or by postal mail at Department of Psychology, Bowdoin College, 6900 College Station, Brunswick, ME 04011.

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Short Behavioral Inhibition Scale

(SBIS; Ntourou, Oyler, Conture, & Walden, 2018)

- **What:** An evidence-based five-question screening test used to assess behavioral inhibition tendencies in young children who do and do not stutter.
- **Parent-Report:** Parents are asked to circle responses that describe their child from **birth to 4 years of age** compared to other children of the same age.
- **Age range:** 3;0-6;0 years of age
- **5 items** scored from **1 to 5**; Totals range from **5-25**
 - Lower scores indicate higher levels of **behavioral inhibition** and higher scores indicate lower levels of behavioral inhibition or a more "expressive" temperament
- **SBIS Questions** relate to:
 - Responses to **unfamiliar** people or situations
 - **Reactions** to the environment or changes in it

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Caregiver's Form: SBIS (SBIS; Ntouriou, Oyler, Conture, & Walden, 2018)

1. Retreats immediately from unfamiliar people or objects OR Approaches people and objects:

1 usually retreats 2 retreats somewhat 3 average 4 approaches somewhat 5 approaches easily

2. Stays close to the parent OR Easily separates from parent

1 difficult to separate 2 hesitant to separate 3 average 4 separates easily 5 separates very easily

3. Takes a period of time to warm up to or to interact with unfamiliar people OR Quickly warms up and interacts with with unfamiliar people

1 long time to warm up 2 somewhat hesitant to warm up 3 average 4 approaches fairly easily 5 approaches and warms up very easily

4. Stops play and vocalizing when unfamiliar person approaches OR Continues to play and vocalizing when unfamiliar person approaches

1 stops 2 quieter and hesitant 3 average 4 plays and notices 5 plays and unaffected by one's approach

5. Stays alone and away from other children OR Engages and easily mixes with children or care giver/teacher in a group

1 isolates 2 quieter and hesitant 3 average 4 mixes fairly easily 5 mixes very easily

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Examiner Information Form: SBIS (Ntouriou, Oyler, Conture & Walden, 2018)

- Sum the five scores from the Caregiver's Form. This summation constitutes the child's SBIS score
- Minimum possible SBIS score = 5; Maximum possible SBIS score = 25
- As a group, children who stutter (CWS) score significantly lower on the SBIS than peers (children) who do not stutters (CWNS). This finding suggests that, as a group, CWS tend to be more behaviorally inhibited
- SBIS Means and (Standard Deviations) for the two talker groups (CWS vs. CWNS) are as follows:

CWS (n = 206)	CWNS (n = 221)
17.37 (4.20)	18.39 (3.96)

- **Important Note: The SBIS is to be used as an augment to NOT replacement for a comprehensive assessment of temperament re childhood stuttering**

Caregiver Interview: Some basic areas to address whether in person, over phone, on Facetime or Skype

- Caregiver(s) main concern(s) with child
- Age at onset (if both parents provide, note each estimate)
- Interval since onset (Time Since Onset, TSO)
- Changes in frequency and type since onset
- Child's apparent awareness/child's concern
- Parents and family members reactions and responses, that is, what do they do to help?
- Family history of speech, language, voice and hearing problems, particularly stuttering;
- Family history of learning disabilities, ADHD, psycho-social adjustment concerns
- Child's developmental history (including health)
- CHAOS and Life Situation Checklist

Potentially Stressful Life Events (after Guitar, 1998, p. 69)

- The child's family moves to a new house, neighborhood, or city
- The child's caregivers remodel, fix or otherwise renovate part of the child's house, possibly including but not restricted to child's bedroom (Conture addition).
- The child is on vacation and something unusual happens (e.g., a 2 foot snowfall restricts family from leaving vacation house) (Conture addition).
- The child's parents separate or divorce.
- A family member dies.
- A family member, or the child, has a medical procedure (e.g., surgery), is hospitalized or gets sick (Conture partial addition).
- A parent loses his or her job.
- A baby is born or another child is adopted.
- An additional person comes to live in the house.
- One or both parents go away frequently or for a long period of time.
- A change in routine, excitement, or anxiety occurs (e.g., holiday, visit, start of school, etc.).

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Recommendations

- Prior to meeting with the client and/or parents:**
 - Evaluate the child's risk
 - Determine priorities
 - stuttering
 - concomitant delay/disorder
 - reactions
 - Decide what you would recommend

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Recommendations continued

- Meet with the client and/or parents:**
 - Summarize results
 - Answer questions:
 - [Is my child stuttering?] How severe is my stuttering?
 - Does s/he/ Do I need therapy?
 - If so, what kind of therapy, how often, where, with whom, etc.?
 - Provide information requested
 - Allow them to make a decision about the next step

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XI. SYNOPSIS OF TREATMENT OF CHILDHOOD STUTTERING, INCLUDING REFERENCE TO TEMPERAMENT AND EMOTION



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Three Basic Goals for Treating Stuttering in Children:

1. Change Home/School Speaking Environment
2. Change Child's Thoughts/Beliefs About Speaking
3. Change Time/Tension of Child's Speech-Language Production



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For Parents of Children Who Stutter

What to Do All the Time
Accept your child and your child's speech - in word and deed - your child is doing the best job possible right now

Things to Do Every Day
(10 - 15 minutes per day at the same time, for example, at breakfast, bedtime, etc.)

1. **Pause** (about 1 sec.) before responding to child's statements, questions, etc.
2. Let child begin and/or select topic(s) of conversation, and after the child speaks, you rephrase his/her remarks, for example, child: "I like the dog," parent: "Yes, you like the dog...he's very nice."

Other Things to Do Routinely

1. Reduce length and complexity of your sentences when child is stuttering
2. Speak at normal to slow normal rate, try to resist the urge to speak rapidly, to rush your speech when talking with your child
3. Spend nonverbal (non-talking) time with the child, for example, playing catch, kicking soccer ball back and forth, riding bikes, swimming, etc.

STUTTERING FOUNDATION
1700 West 10th Street, Suite 100 • Minneapolis, MN 55408
1-800-992-9392
www.stutteringhelp.org

Produced by Edward S. Conture, Ph.D.
Vanderbilt University Center for Child Language and Communication Sciences
1-435-536-3888

Listen While Others Are Talking



Wait Your Turn While Others Are Talking



Be Quiet While Others Are Talking



After Richels &
Conture, 2007,
Fig. 5-7

Helping the Behaviorally INHIBITED CWS

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

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Helping the 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")
 - "Play" with the concept of fast and slow
- 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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Summary: Therapy

Some Basic Goal(s)

1. Normal Disfluency not Total Fluency
2. Change Outside not merely Inside Clinic
3. Provide child with speech that is USABLE in everyday communication situations
4. Where appropriate, help child and child's caregivers better adapt to child's strong negative affect or surgent temperamental proclivities.

Summary: Therapy *K.I.S.S.*

When in doubt, with parents or children: Keep it Simple Stupid (K.I.S.S.). In essence, what won't get done/completed are the following: elaborate home work assignments, expectations of 24/7 monitoring of speech fluency (Dial 1-800-GETREAL), turning in all written assignments at beginning of each treatment session, etc

What might get done: Break down all outside-of-school-assignments to essentials, for example, one particular time/place per day, one activity, for finite period

Keep in mind: Fifteen minutes/day 5-6 days per week is better than 1 hour on Sunday, the day before Monday's treatment session

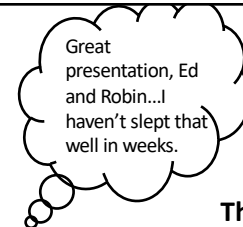
Summary: Therapy

Above all: Keep on Keeping On:

SLPs can and do make positive differences in the lives of children who stutter and their families;

Try to learn what our positive contributions are and become involved in making them

"The only thing I knew how to do was to keep on keeping on..." Bob Dylan



The End
The End
The End

The End
The End



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Questions? comments?

Selected References

Temperament and emotion:

- *Rothbart, M. (2011). *Becoming Who We Are: Temperament and Personality in Development*. New York: The Guilford Press.
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