

# ***A Multidimensional Approach To Assessment and Treatment of Stuttering in School-Age Children***

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## **Assumptions and Perspectives:**

1. “One of the most striking things about stuttering is its individual variability” (Starkweather, 1999).
2. The variability of stuttering underscores the importance of focusing on individual differences from a multidimensional perspective.
3. Unfortunately, the variable patterns of stuttering in children create major challenges for the clinician when assessing and treating the disorder.



## ***Some Recent Multidimensional Models of Stuttering***

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- Starkweather (1987, 1997) & Starkweather, Gotwald, & Halfond (1990): **Demands & Capacities Model**. This model focuses on the relationship between self-imposed or environmental speech demands and the speaker's capacities (speech motor, language formulation, social-emotional maturity, and cognitive skills).



## ***Some Recent Multidimensional Models of Stuttering***

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- Smith (1999): Proposed that stuttering is a dynamic disorder, with many processes can be observed at multiple levels, within a wide range of time, with multiple tools. The main feature of Smith's model is that all individuals who stutter experience a breakdown in speech motor processes that are influenced by a variety of factors.



# ***Our Multidimensional Model of Stuttering***

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- Susca & Healey (2001) and Healey, Scott Trautman, & Panico (2001): Stuttering is related to a complex interaction of five factors which include **Cognitive**, **Affective**, **Linguistic**, **Motor**, and **Social** components. We refer to this model as the CALMS Model.



# ***Conceptual Framework for the CALMS Model***

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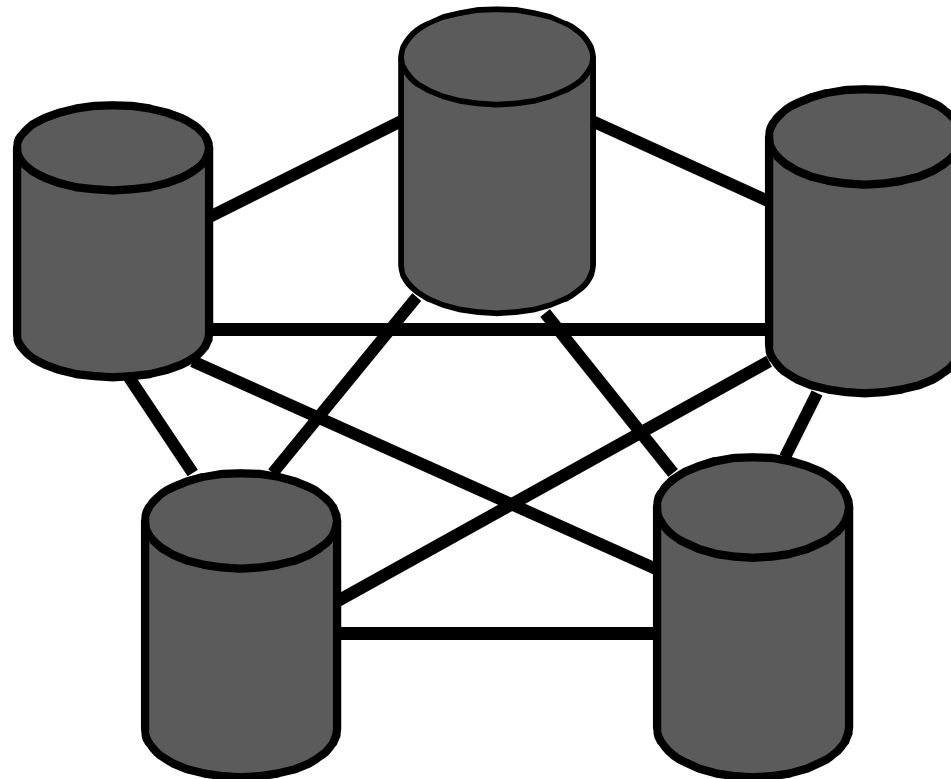
- This model borrows elements from existing multidimensional models of stuttering:
  - 1. Stuttering is a dynamic disorder and changes over time.
  - 2. Multiple factors (cognition, emotions, motor speech processes, social, language) interact in a complex way to maintain stuttering.
  - 3. Children's capacity for fluency is influenced by their capacities or performance in a variety of demanding speech situations.
  - 4. A multidimensional model accounts for the heterogeneity of the stuttering.

# The CALMS Model of Stuttering

**Affective** - feelings, emotions, attitudes

## **Cognitive**

- thoughts
- perceptions
- awareness
- understanding



## **Linguistic**

- language skills, lang. formulation demands & discourse

**Social** - effects of type of listener & sp. situation

**Motor** - Sensori-motor control of speech movements

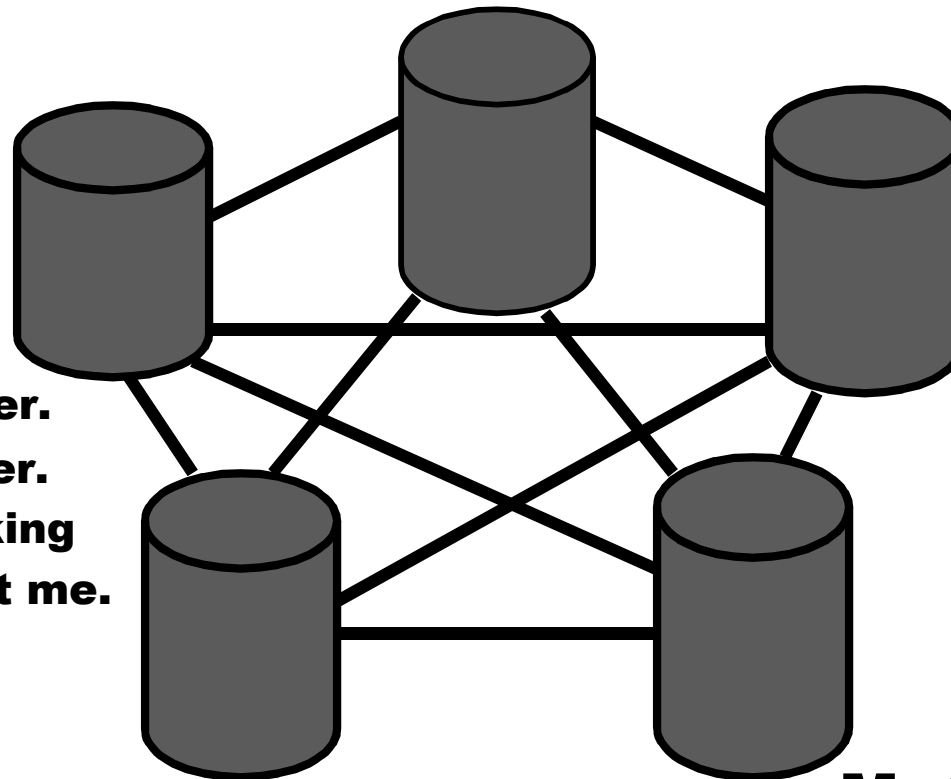
# An Example of How the CALMS Factors Interact During a Speaking Situation

**Affective** - I feel embarrassed, I'm confused, I'm afraid, I hate my stuttering.

## Cognitive

- I hope I don't stutter.
- I'm not a good talker.
- I want to avoid talking
- People will laugh at me.

**Social** - I really don't want to talk with this person. I feel pressure to talk in this situation.



## Linguistic

- What am I going to say? How will I say this and be fluent?

**Motor**- I wonder if my fluency targets will work? My tongue and voice feel tense.

# ***Using the CALMS Model as a Framework for Assessment & Treatment.***

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- Using the factors that comprise the model, we have developed a preliminary rating scale to document a child's performance in all five areas.
- Ratings are based on a 7 point scale, where 1 = normal and 7 = severely abnormal.
- The rating scale accounts for both subjective and objective measures of performance. Data based judgments should be the focus of as many ratings as possible.

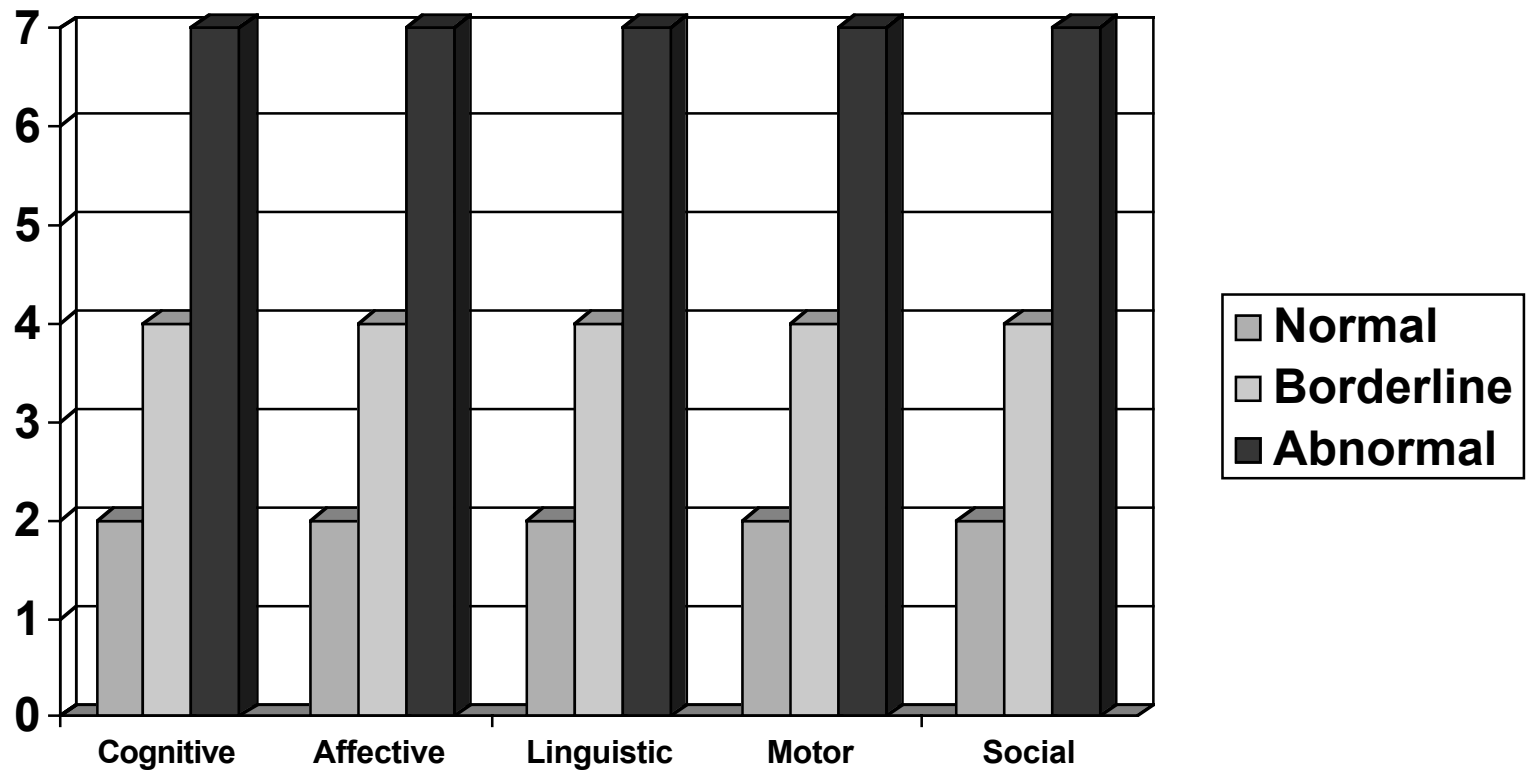


# Rating Scale (con't)

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- When values from standardized tests or measures are used, the ratings are similar to those used in a scale developed by Riley and Riley (2000). (refer to handout on the quantification of the 1-7 ratings)
- Ratings are based on levels of performance based on how children who stutter compare to how normal speakers would perform in each area.
- Each rating has its own category and we include 2 levels within the normal range, 2 levels that are considered borderline, and 3 levels of abnormal performance.

# *Rating Scale Framework*





## Rating Scale (con't)

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- Items selected for use under each CALMS component are based on typical information obtained in an evaluation of stuttering.
- The number of items varies across components and is related to how much information one could obtain in each area.
- A mean score is obtained for each component. Each average score will be used to develop a graphic CALMS profile of performance.



# ***Case Example #1***

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- **Cory: Age 12**
- **Cognitive (Mean Score = 5.5)**
  - Moderate difficulty recognizing when and where disfluencies occurred.
  - Minimal understanding of stuttering.
  - Minimal understanding of why speech modification strategies help.
  - Thinks that stuttering is not acceptable.



# ***Cory's Profile***

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- **Affective** (Mean Score= 6.2)
  - Stated that he “hates stuttering a lot” and “stuttering is awful.”
  - Moderately negative perceptions about being a person who stutters.
  - Feels bad about being teased when he stutters.
  - CAT score = 26 (mean for CWS= 17.3, SD = 7.7)  
His score is between 1 and 2 standard deviations from mean for CWS so his CAT score is rated a “6.”



# ***Cory's Profile***

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- **Linguistic (Mean Score = 4.0)**
  - Stuttering significantly impacted by changes in utterance length and complexity.
  - Becomes highly disfluent when speech context is decontextualized.
  - Difficulty creating stories in oral and written for.



# ***Cory's Profile***

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- **Motor** ( Mean Score = 4.25)
  - Multiple part-word repetitions and silent sound prolongations characterize stuttering pattern.
  - Tense articulatory posture during prolongations.
  - SSI-3 score = 18 (rating = “6”)
  - Frequency of stuttering with various partners unverified, therefore, not rated.

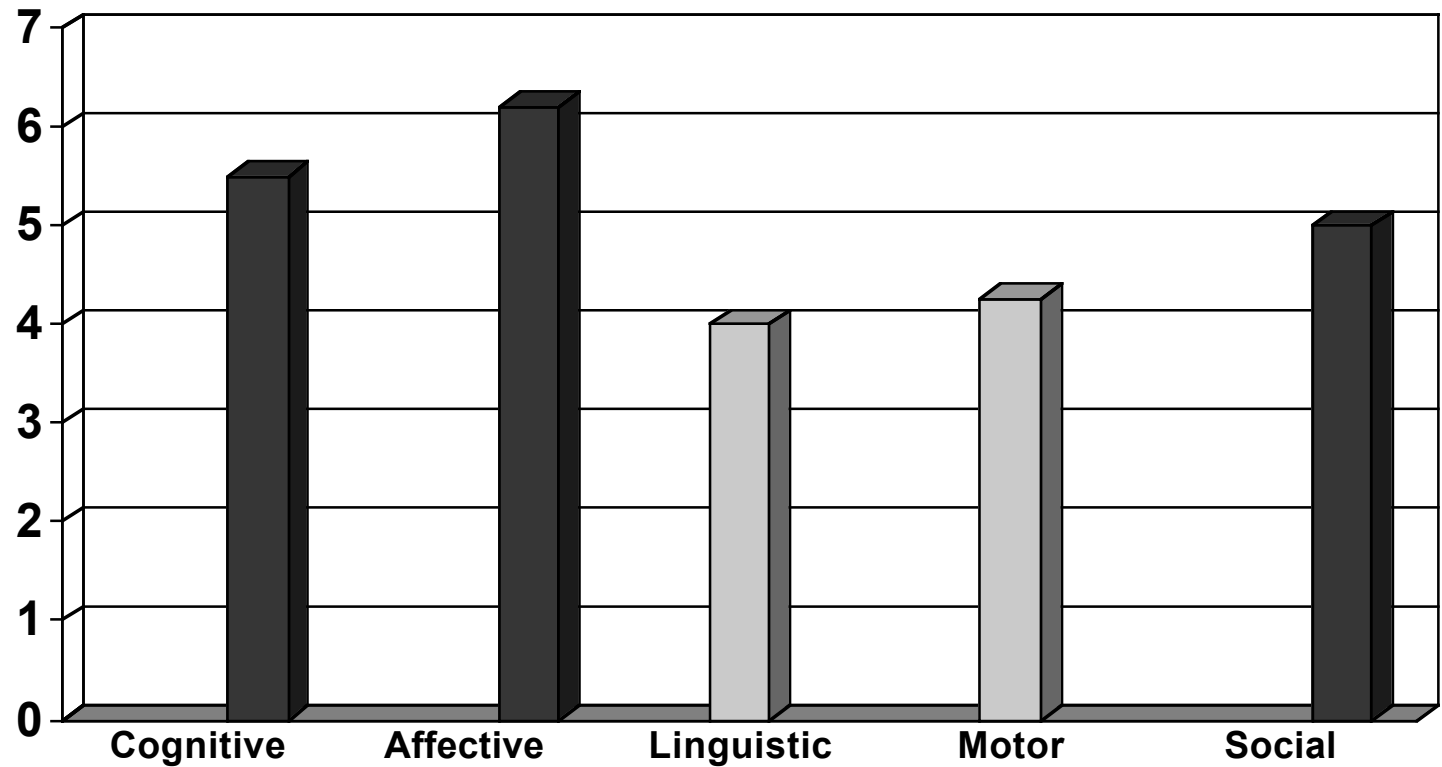


# ***Cory's Profile***

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- **Social** (Mean Score = 5.0)
  - Stuttering frequency varies considerable according to type of listener and speaking situation.
  - Self conscious about stuttering around friends.
  - Small circle of friends.
  - Becoming less social because of stuttering.

# Cory's CALMS Profile





# Case Example #2

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- **Colby: Age 5**
- **Cognitive: (Mean Score = 6.75)**
  - Hypersensitive to his stuttering and to high frequency of normal disfluencies.
  - Thought that repetitions were not acceptable.
  - Father's negative reaction to stuttering resulted in significantly reduced talking.
  - Colby had little, if any, understanding of his speaking difficulty.



# Colby's Profile

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- **Affective** (Mean Score = 6.4)
  - Colby's perceptions were quite negative
  - Colby had stopped talking to peers and his father.
  - Strong feelings that stuttering is bad.
  - Embarrassed, ashamed, and worried about his speech.
  - Fearful of talking in front of others, including clinician.



# Colby's Profile

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- **Linguistic (Mean Score = 4.5)**
  - Stuttering highly reactive to changes in utterance length and complexity.
  - Overall language ability: PLS-3; receptive lang.=93; exp. lang.=70; total lang.score=80.
  - Articulation/phonology was within normal limits.
  - Considerable difficulty with exp. language



# Colby's Profile

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- **Motor** (Mean Score = 3)
  - Some PWR and also lots of INTJ, REV, & PHR.
  - Rapid PWR, ave. 3 unit reps
  - Rating of freq. of stuttering with:
    - Teacher = 2
    - Peers = 4
    - Clinician = 2



## Motor (con't)

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- No observable secondary coping behaviors.
- SSI-3 score = 14 (rating = 3)
- Overall motor control within normal limits.

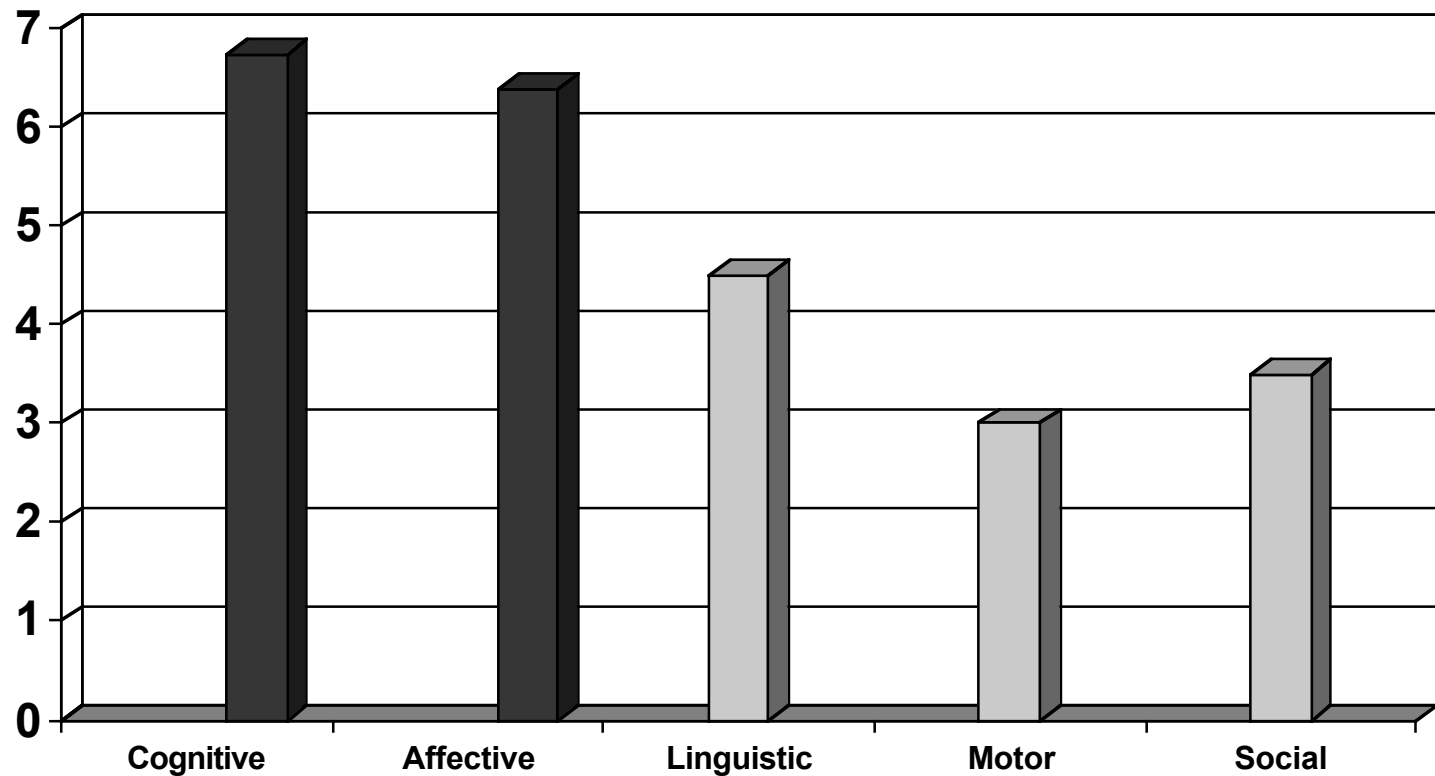


# Colby's Profile

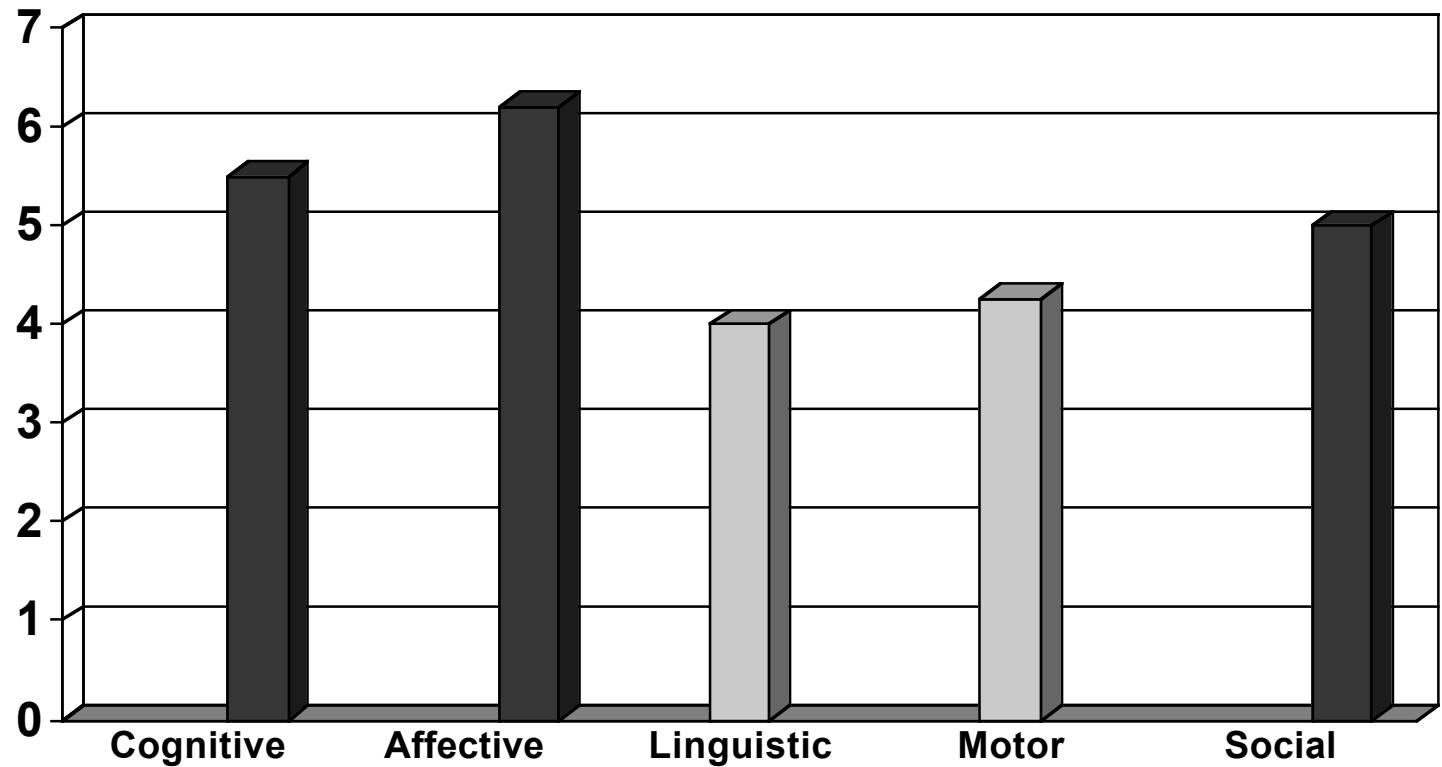
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- **Social** (Mean Score = 3.5)
  - Strong avoidance of father and certain peers.
  - Moderate stuttering in classroom but speech within normal limits in nonacademic and extracurricular activities.
  - Hesitant to participate in oral activities which could have been due to language and fluency problems.
  - Stopped interacting with peer who asked Colby about his speech.

# Colby's CALMS Profile



# Cory's CALMS Profile



# ***Some General Principles of Treatment***

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- Stuttering takes a long time to change.
- Our relationship with the client is key. We need to be counselor, coach, and friend.
- Be a good model for the child...show different ways to think, feel, react, & use the speech mechanism.
- Your attitude makes a big difference.

# ***General Principles of Treatment***



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- Chose topic or theme that will facilitate responses from the child.
- Begin each treatment session at a level where the child can be successful but also challenge client's skills.
- Build a strong relationship with the child and have fun!
- Model everything you want the child to do.



# ***Treatment Goals***

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- When planning treatment, goals should be:
  - A) Meaningful and attainable
  - B) Broad enough to cover multiple aspects of the disorder.
  - C) Individualized rather than standardized
  - D) Educationally relevant

# ***Possible Goals for Children Who Stutter***

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- n 1. Decrease freq., severity, and duration of stuttering.
- n 2. Decrease word and situation avoidance.
- n 3. Decrease negative emotional responses and sensitivity to stuttering.
- n 4. Increase awareness stuttering and self-monitoring.
- n 5. Decrease feelings of fear, anxiety, and tension related to stuttering.
- n 6. Educate peers, teachers and parents about stuttering and the treatment of



## ***Goals (con't)***

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7. Increase child's understanding of stuttering and how speech is produced.
8. Increase the child's ability to cope with teasing.
9. Improve child's self-esteem and self-confidence.
10. Increase use of speech modification techniques during structured and spontaneous speaking situations.
11. Reduce struggle and tension during stuttering.



## ***Goals (con't)***

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- n 12. Increase child's social-pragmatic skills.
- n 13. Increase verbal participation in class.
- n 14. Increase ability to discuss stuttering problem with others.
- n 15. Increase the number of opportunities a child has to use new speech skills in a variety of realistic speaking situations



# ***Treatment Using CALMS Model***

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- Cognitive
  - Affective
  - Linguistic
  - Motor
  - Social
- Better thinking and understanding
  - Reduce negative feelings and attitudes
  - Control & shift linguistic demands to improve fluency
  - Focus on speech skills that enhance fluency and modified stuttering
  - Use of skills in realistic speaking situations, transfer/maintenance

# ***Relating CALMS Profiles to Treatment***

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- Given the dynamic, unique profiles of each child, the next question is, “How does the profile assist in the development of treatment goals and objectives?”
- The profile shows area(s) of concern that may need to be addressed more specifically than other components. The decisions a clinician has to make relates to which areas need addressing in treatment.



# ***Cognitive Treatment Goals***

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- ***Cognition Component: Thoughts, Awareness, Knowledge, Understanding, and Perceptions:***
  - ✓ Help child develop positive thoughts, perceptions, and awareness of stuttering and fluency.
  - ✓ Focus on what the child does or does not know and understand about his/her stuttering.
  - ✓ Explore the child's reactions to and perceptions of listeners to the stuttering. Survey family, peers, teachers.



# ***Cognitive Treatment Activities***

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1. Explore and discuss the differences between normal fluency, normal nonfluencies, and stuttering. Use voluntary stuttering to produce imitations of child's stuttering pattern.
  
2. Use books/websites about stuttering:
  - a) Children: Sometimes I Just Stutter (SFA)
  - b) Adolescents: A Guide for Teens (SFA)
  - c) Main website: [www.stutteringhomepage.com](http://www.stutteringhomepage.com)
  
- 4  
4 3. Understand how the speech mechanism works- focus on how physiology of speech is connected to feelings.
  - a) a). Diagram of speech system
  - b) b). Speech Pizza



# ***Cognitive Component Treatment Activities***

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4. Changing Thinking: List negative thinking and discuss a more positive way to look at each statement listed.
5. Question of the Week- clinician and/or client driven questions.
6. Journal with older children: respond to certain questions or issues in journal.



## ***Cognitive Component Benchmarks***

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- Collect, date, and save any charts, drawings, and/or diagrams used during this stage of therapy.
- Collect and date statements by child, parent, teacher, peer that address issues for this component.
- Collect data on self-monitoring and self awareness of stuttering. Note amount of progress and level of support needed to demonstrate skill.
- Change in rating for this component in the CALMS rating scale.

# ***Affective Component Treatment Goals***

## ■ ***Affective Component: Feelings & Attitudes***

- ✓ Normalize feelings, emotions, and attitudes about stuttering. Desensitization and “De-awfulizing” stuttering
  - It’s OK to stutter, It’s OK to fail, It’s OK to feel bad about stuttering.
- ✓ Create an understanding of emotional reactions to stuttering. Help them accept emotional reactions.
- ✓ Improve self-esteem and positive reactions to stuttering



# ***Affective Component Activities***

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- Use books pamphlets that address emotions and attitudes.
- Use voluntary stuttering to reduce anxiety, sensitivity, and fear of stuttering.
  - Teach child to stutter in different ways and play with stuttering
- Teach others how to stutter-grade response.
- Use objects to represent stutters and emotional reactions. Create a “stutter monster.”
  - Clay figures, balloons, paper toss



# ***Affective Component Benchmarks***

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- Time-interval changes in CAT scores and other paper and pencil scales from Chemla and Reardon book from the SFA
- Comments/statement from child, parent, teacher, peer that indicates a more positive reaction to stuttering and feelings of improved self-esteem.
- Change in rating for this component in the CALMS rating scale.

# ***Linguistic Component Treatment Goals***

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## ■ ***Linguistic Component: Language Formulation and Discourse***

- ✓ Support responses with contextualized speech contexts and then move to decontextualized speaking tasks. Also, increase the flexibility in language use through changes in semantic complexity.
  - ✓ (See website for 2001 ISAD paper on manipulating linguistic context in stuttering therapy...[www.unl.edu/fluency](http://www.unl.edu/fluency))



# Linguistic Component Treatment Goals (con't)

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- ✓ Increase speech performance relative to a range of linguistic levels
  - ✓ (Across sessions, build on success but also challenge the child to managing speech at higher levels of language use).
- ✓ Improve story retelling and other discourse skills.
  - ✓ (Note how the level of fluency and language formulation proficiency change as the situational, discourse, and semantic levels change).



## ***Linguistic Component Benchmarks***

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- Assess stuttering frequency across various levels of contextualization, discourse, and semantic difficulty.
- Assess types of discourse and levels of linguistic support that take place in the classroom.
- Change in the rating for this component in the CALMS rating scale.

# ***Motor Component Treatment Goals***

- *Motor Component: Improvement in the Motor Control of Speech Movements*
  - ✓ **1. Increase use of speech modification strategies**
    - ✓ ***THE 3 D's (Shapiro, 1999)***
      - ✓ **Discuss (explain) how fluency and stuttering are produced. Draw it and map it out.**
      - ✓ **Repeat explanations often. Have child put into own words.**
      - ✓ **Demonstrate (show) what happens during fluency and stuttering.**
      - ✓ **Drill (practice) skills that promote fluency. When a stuttered moment occurs, have child explore what needs to change. Make technique sound natural.**



## ***Motor Component (Con't)***

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2. Increase use of a combination of fluency shaping and stuttering modification treatment techniques.
3. Increase knowledge of how and why any technique makes talking easier.
4. Develop a core set of strategies the child likes best and feels are the most effective in helping him/her talk in an easier way.

# ***Motor Component Treatment Activities***

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- Draw/label key parts of the speech mechanism. Make “Speech Dude.”
- Use diagrams, words, or analogy for teaching each type of speech modification strategy:
  - Mountains or slide for easy onsets of phonation.
  - Stretched words and hooked words for continuous phonation.
  - Four wheel drive out of mud or gradual opening of clinched fist for pullouts.
  - Butterfly landing on flower or any light touch for light articulatory contacts.

# ***Motor Component Treatment Activities***

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- Use “Tool box” analogy for selecting core set of strategies.
  - Easy onsets of phonation, rate reduction, light contacts, easy-relaxed & smooth movements, voluntary stuttering, pullouts and cancellations.
- Use 1-5 rating scale for evaluating success of performance.
- Teach variations of how the strategy or technique can be produced.
- Have a plan of gradually decreasing the obvious use of each strategy..work on speech naturalness yet self-managed fluency control.



# ***Motor Component Benchmarks***

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- Test knowledge and understanding of components of the speech mechanism.
- Measure the use of a strategy in structured and spontaneous speaking tasks.
- Measured improvement of speech when using specific speech strategies.
- Number of times strategy is used in a specific way in specific speaking situations.
- Changes in the SSI-3 score from previous administration.
- Change in rating of this component in the CALMS rating scale.

# Social Component Treatment Goals

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## ■ *Social Component: Pragmatics of Social Interactions and Use of Speech Strategies in Realistic Speaking Environments*

- ✓ 1. Improve general communication skills:
  - ✓ A. Being a good listener and maintaining eye contact.
  - ✓ B. Not interrupting someone else who is talking.
  - ✓ C. Dealing with different listeners and situations that impact the frequency of stuttering.

# ***Social Component Treatment Activities***

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- Develop speech activities that are based on a hierarchy of realistic speaking situations.
- Role play speaking situations.
- Do problem solving for difficult speaking situations.
- Work on teasing and how to deal with bullies.
- Practice speech skills with different communicative partners.
  - Peers
  - Teachers
  - School secretary
  - School Nurse
  - Paraeducators



## ***Social Component Benchmarks***

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- Client comments about success in various speaking situations.
- Parent reports
- Teacher reports
- Charts showing objective changes in communication effectiveness.



# ***How will I know if therapy is successful?***

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- ✓ There are many different ways to define “successful therapy.”
  - ✓ A. Client has achieved 100% fluency in all speaking situations.
  - ✓ B. Client shows a reduction of “X %” of stuttering for “X” minutes of speaking without increasing other undesirable speaking behaviors.
  - ✓ C. Client has been able to change severe stuttering into mild stuttering.



# Defining Success

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- ✓ D. Negative reactions, emotions and attitudes have been reduced. Child's beliefs and thought patterns have lead to less avoidance and increased acceptance of stuttering.
- ✓ E. Child has improved language skills which has facilitated improved fluency.
- ✓ F. Parents have become more comfortable, patient, and less critical of their child's stuttering.
- ✓ G. Child has improved his self-monitoring and self-directed use of speech strategies that improve fluency.
- ✓ H. Child perceives and experiences being more relaxed about stuttering and in a little more control of his speech.



# Final Thoughts

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- ✓ **Approach therapy as a dynamic, multidimensional process. Many factors interact to maintain the disorder and multiple factors need to be addressed in therapy.**
- ✓ **There isn't one approach that will work for all children who stutter. Tailor the therapy to the needs of the child through decision making and problem solving.**
- ✓ **Children who stutter need to see that they should not hide from their stuttering, that it's OK to stutter, and with time and effort, they can learn to talk in an easier way.**
- ✓ **The ultimate treatment goal is to help a child believe, feel, and talk in a way that's comfortable for him/herself.**