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Suzanne Hungerford
SUNY Plattsburgh, hungersm@plattsburgh.edu

Katharine Gonyo

Shasta Whitford

Nancy Bassendowski

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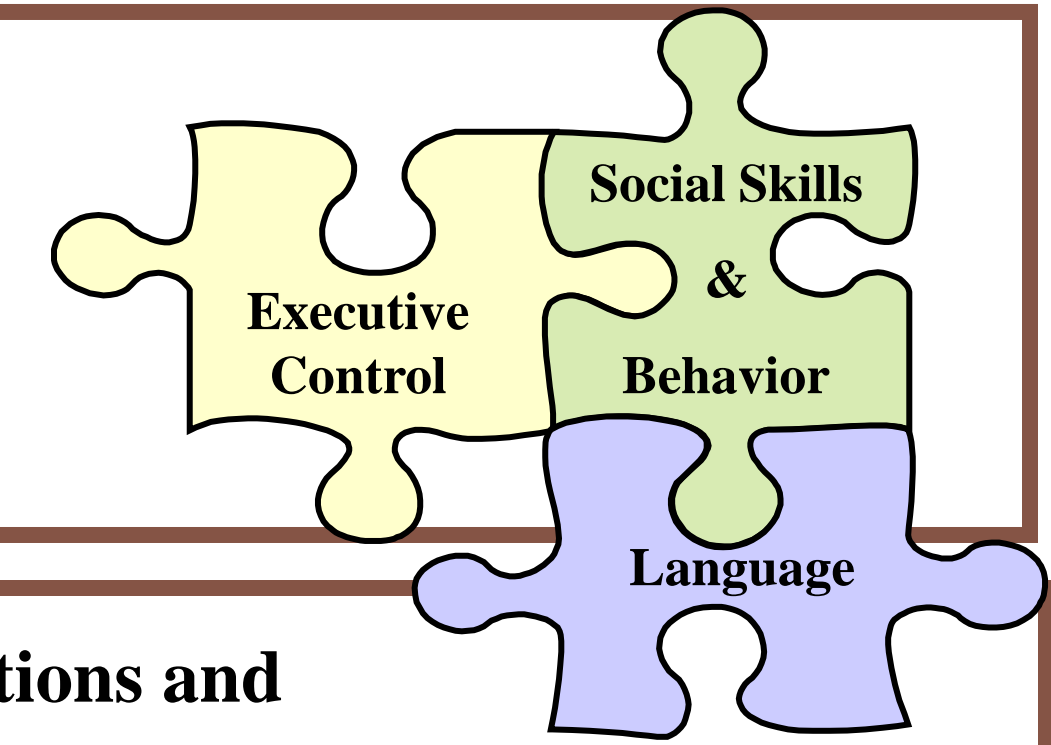
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Executive Functions and their Relationship to Social Skills and Problem Behaviors

Suzanne Hungerford, Katherine Gonyo, Shasta Whitford, and Nancy Bassendowski
Plattsburgh State University of New York, Department of Communication Disorders and Sciences



Introduction

- Research shows that children with language disorders are at high risk for social skill deficits and problem behaviors (Baltaxe & Simmons, 1990; Beitchman et al., 1996; Camarata, Hughes & Ruhl, 1988; Cantwell & Baker, 1987; Cohen, 1996; Fujiki & Brinton, 1996; Hart, Fujiki, Brinton, & Hart, 2004; Gallagher, 1999), although the reasons for this are not entirely clear.

- Children with executive dysfunction disorders are also prone to exhibiting social skill deficits and problem behaviors (Schonfeld, Paley, Frankel, & O'Connor, 2006; Wahlstedt, Thorell, & Hohlin, 2008).

- Executive functions (EFs) "allow us to organize our behavior over time and override immediate demands in favor of longer-term goals" (Dawson & Guare, 2004, p.1). EF skills include the ability to:
 - initiate actions when appropriate;
 - inhibit impulses and emotions when necessary;
 - plan actions;
 - organize behavior and materials;
 - regulate one's attention appropriately;
 - hold information in memory to complete tasks;
 - self monitor.

- EFs may mediate several aspects of social and behavioral functioning (Riggs, et al., 2006), although few studies have examined specifically which executive functions are most related to social functioning and behavioral regulation (Kiley-Brabeck & Sobin, 2006; Wahlstedt, Thorell, & Bohlin, 2008).

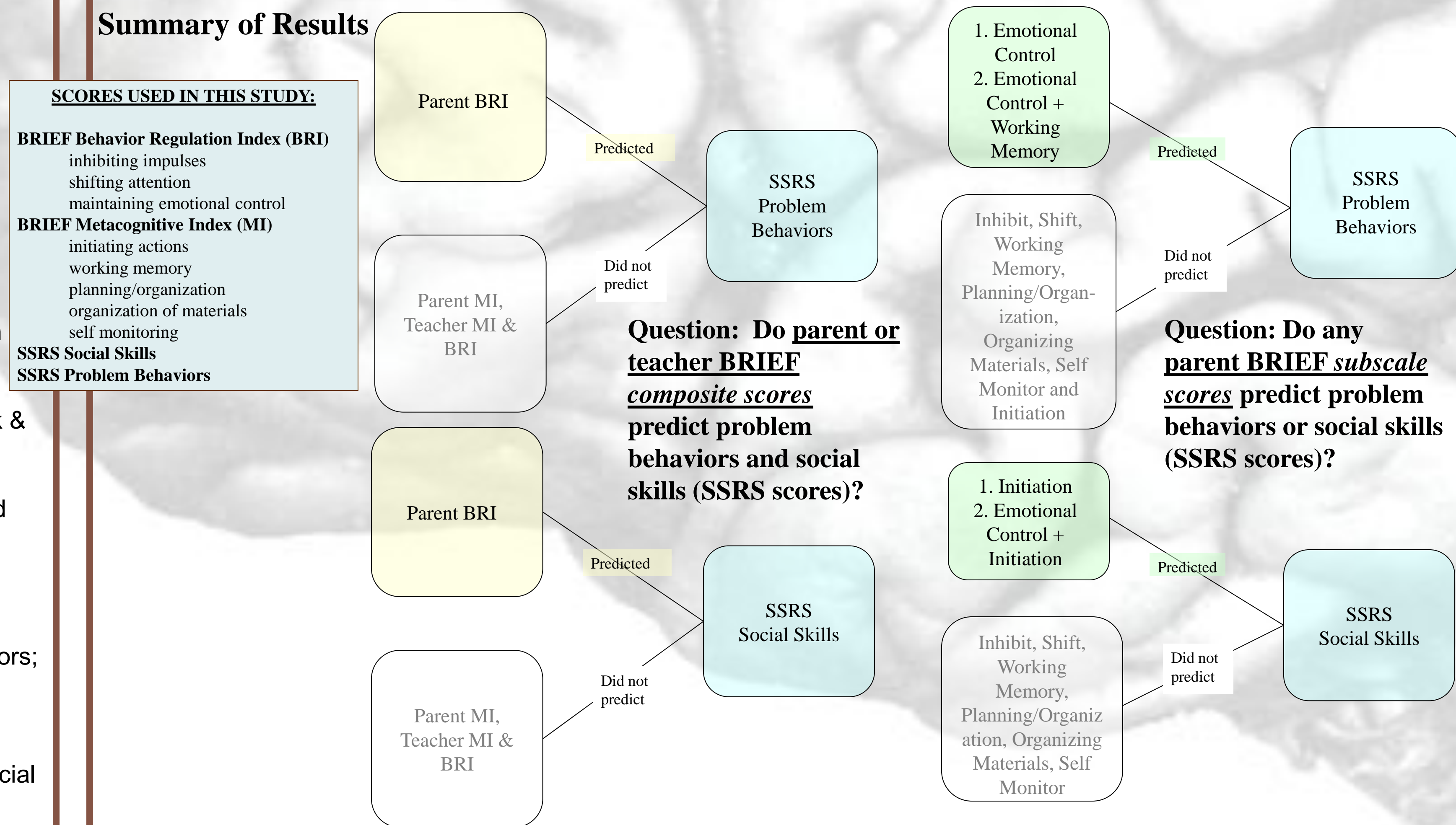
- We examined executive functions, social skills, and problem behaviors in children referred for auditory-language processing assessment to determine:
 - if executive dysfunction predicts deficits in social skills;
 - if executive dysfunction predicts problem behaviors;
 - if teachers' or parents' ratings of executive dysfunction have more predictive value for social skills and problem behaviors;
 - which executive functions are most related to social skills and problem behaviors.

Methods

- The data for this study were gleaned from the records of 45 children (average age, 9.6 years) who had been referred to the Plattsburgh State University for auditory and language processing assessment. The study was approved by the university's Committee on the Protection of Human Subjects. Recorded from the files were scores from the Parent and Teacher forms of the Behavior Rating Inventory of Executive Functions (BRIEF; Gioia, Isquith, Guy, & Kenworthy, 2000), as well as the Parent form of the Social Skills Rating System (SSRS; Gresham & Elliott, 1990). Very few of the children received Teacher versions of the SSRS, so these were not included in this study.

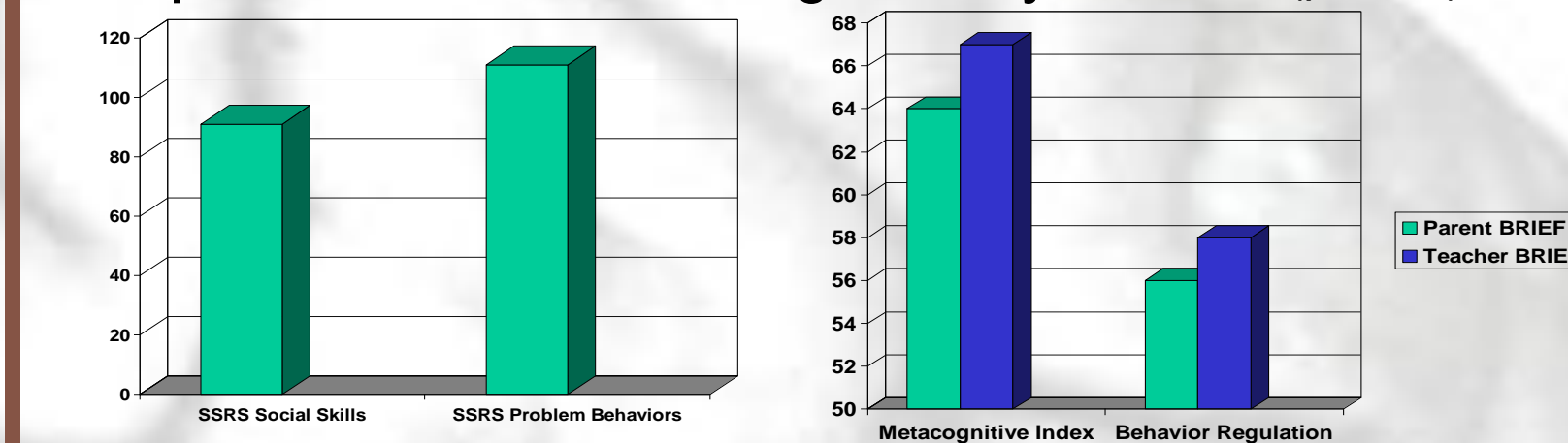
- A series of stepwise linear regressions were performed using SPSS for Windows 10.0. Alpha level set at .05. Independent (or predictor) variables were composite or subscale scores from the Teacher or Parent forms of the Behavior *Rating Inventory of Executive Functions* (BRIEF) (Gioia, Isquith, Guy & Kenworthy, 2000). Dependent variables were Social Skills and Problem Behavior standard scores from the Parent form of the *Social Skills Rating System* (SSRS; Gresham & Elliott, 1990). T-tests and descriptive statistics were also used to make comparisons and describe the data.

Summary of Results



Results

First, a one sample t-test revealed that these children, referred for auditory and language processing assessment, did have significantly fewer social skills ($p < .05$) and significantly more problem behaviors ($p < .0005$), and more executive dysfunction ($p < .0005$) than the normative population, as measured by the SSRS and BRIEF scores. T-tests also revealed that Parent and Teacher BRIEF composite scores were not significantly different ($p > .05$).



- Research Question:** Do parent or teacher ratings of executive dysfunction predict problem behavior scores?
Answer: Again, only Parent BRI alone is a very strong predictor of SSRS problem behaviors ($R^2 = .396$, $R^2_{adj} = .376$, $F(1, 29) = 19.05$, $p < .0005$).

- Research Question:** Do parent or teacher ratings of executive dysfunction predict social skills scores?
Answer: Of parent and teacher BRIEF composites (MI and BRI), only Parent BRI predicted social skills scores from the SSRS ($R^2 = .385$, $R^2_{adj} = .363$, $F(1, 29) = 18.12$, $p < .0005$).

- Research Question:** Which specific executive dysfunctions (subscale scores) are related to problem behaviors?
Answer: One predictor of SSRS problem behaviors is Parent Emotional Control ($R^2 = .299$, $R^2_{adj} = .275$, $F(1, 30) = 12.77$, $p < .0005$), and the other is a combination of Emotional Control and Working Memory ($R^2 = .417$, $R^2_{adj} = .376$, $F(2, 29) = 10.35$, $p < .0005$).

- Research Question:** Which specific executive dysfunctions (subscale scores) are related to social skills?
Answer: Of parent BRIEF subscale scores Initiation predicted Social Skills scores from the SSRS ($R^2 = .473$, $R^2_{adj} = .456$, $F(1, 30) = 26.94$, $p < .0005$). Furthermore, another model which includes Initiation and Emotional Control emerged as a significant predictor ($R^2 = .547$, $R^2_{adj} = .516$, $F(2, 29) = 17.51$, $p < .0005$), however, the addition of Emotional Control scores did not add much predictive value.

Clinical Questions and Implications

Are the social skill weaknesses observed in our population the result of executive function weaknesses?

- Difficulty developing a plan of action
- Difficulty starting a task
- Inflexibility
- Weak problem solving skills
- Inability to learn from consequences
- Weak working memory
- Weak emotional control

Or, is a child's inability to contain emotions or to initiate and participate appropriately in social activity due to:

- Poor communication skills
- Weak core language
- Weak social/ emotional language
- Diminished capacity to read or project appropriate social emotion.

- Our study shows that EFs are strongly associated with social skills and problem behaviors. We did not examine language in this study, but it may be that social and behavioral difficulties are a combination of these two problem areas - language and executive function.

- The answers to these questions will help to determine how best to treat these clients so as to improve social communication and behavioral regulation.

Resources on Executive Function Training

- Several sources for teaching executive function or social skills are available. School curriculums on executive function and social skills training may be paired with community support. Some programs are individual class courses, and some are individual or group sessions.

See **handout** for resources and references.

