ASHA.org Published in Perspectives on Language and Learning March 1, 2014

Executive Functioning and Social Pragmatic Communication Skills: Exploring the Threads in Our Social Fabric

Michelle Garcia Winner

Founder, Social Thinking
San Jose, CA

Pamela Crooke

Social Thinking
San Jose, CA

Financial Disclosure: Michelle Garcia Winner is a speech-language pathologist and the founder of Social Thinking and Social Thinking Publishing. Pamela Crooke is the Director of Research and Clinical Operations and Senior therapist at the Social Thinking Center.
Nonfinancial Disclosure: Michelle Garcia Winner has previously published in the subject area. Pamela Crooke has previously published in the subject area.

Abstract

The development of treatment plans and related strategies to help our students with social pragmatic challenges improve upon their social communicative competencies requires us to explore how Theory of Mind (ToM), Central Coherence (CC), and Executive Functioning (EF) are interwoven. In this article, we will deconstruct elements of social learning to explore how EFs play a critical role in face-to-face communication and how this information is not captured on any current standardized assessment currently available in our field. Addressing the need to teach our students to be stronger social observers or "detectives" in order to socially problem solve and the practice adapting their behaviors based on the situation and the people within it is key to teaching social EF. Treatment philosophy encouraging the use of systematic social communication frameworks, such as Carol Gray's Social Stories (Gray & Garand, 1993) and Social Thinking's Social Behavior Mapping (Winner, 2007b) is explored to assist our students' in their development of social and self-regulatory strategies.

In today's educational and clinic arenas, *executive functioning* (EF) has morphed into an umbrella term that can represent many different things to many different people. At a core level, most of us think about it from a functional standpoint: the abilities that allow us to plan, problem solve, and organize our lives—the "doing" processes we undertake. But what exactly are we supposed to plan, organize, and problem solve? The things we do or the thoughts in our heads? How about our social relationships? To what extent is EF part of the dynamic and synergistic social learning process we all experience day-to-day?

Furthermore, if we acknowledge that EF and social learning are, in fact, fibers in the same cloth that is our social nature, how does this notion impact how we teach social skills? Are we only teaching social *skills*, or do we "teach social" as a broader goal that encompasses not just an emphasis on the social behaviors we exhibit, but includes teaching the necessary EF abilities that facilitate the mental processing that precedes the behavior? At a practical level, is "thinking social" actually a social EF process that needs to be taught? This paper will take on the challenge of honing in on the role of *social* in EF that has been overlooked, in part, by contemporary research (Barkley, 2012). While common sense combined with professional judgment tells us that EF plays a role in social functioning across the home and school day, it does not give us a pathway for treatment. Our hope it to keep common sense as our guidepost while connecting the current literature to guide practical treatment strategies for the interplay between social learning and EF.

Historical Perspective

Back in the 1980s, many speech-language pathologists (SLPs) learned about EF through their work with clients with head injuries and strokes. At that time, the treatment community had a more traditional perspective on EF. We, the authors, remember learning that EF encompassed the skills that executives (or their secretaries) needed to help them do their jobs well: creating effective action plans to help accomplish short- and long-term goals, coupled with the necessary time management skills and other organizational strategies to support that objective. We primarily thought about EF as it related to task completion and planning.

The treatment strategies we developed to help our traumatic brain injured clients proved equally useful in the 1990s as we all began working with higher functioning students on the autism spectrum, or with specific language impairment, as well as others whose diagnostic labels included social learning challenges. Many of these individuals needed to work on their EF skills to be successful in academics and get through the school day. They lacked organizational skills, had problems breaking down large assignments into smaller, manageable chunks, and grappled with time management. Interestingly, we also began to see a connection between what we were teaching them about their academic organizational skills and the social skills they needed to relate to peers.

A major "aha" moment occurred in the early 1990s with the realization that by the time our students were in middle school, the "skill" of making and keeping a friend required many of the same EF organizational abilities involved in independently completing homework and remembering to turn it in. Think about it. By the upper elementary school years, adults expect students to actively use their EF skills to make their own "play dates" and maintain their social relationships minus any adult supervision. This involves everything from paying attention to the student at school to making first contact, learning more about the person (his/her interests) as their friendship gets underway, gathering information to say in touch (Facebook, phone number, email), initiating an invitation, thinking about what to say, etc. At some point, the "getting together" part of the social experience happens: making a group plan about what to do (hang out, play video games together, go to a movie or the mall), and then following through to get together at the mutually agreed upon time and execute the plan—or change it up at any point and still stay connected!

In addition, students need a strategy to sustain contact when not in face-to-face communication so the friendship doesn't die out. And, throughout it all, they need to be socially savvy to keep the relationship inviting and engaging. This involves showing interest in the other person, considering their thoughts and feelings, and regulating behavior in a manner that the other person interprets as friendship-worthy, while staying true to one's own social values and personality. It is social awareness, social and emotional regulation, creating plans, managing time, taking initiative, all paired with perspective taking. It's EF on steroids—that's really what social EF is!

Helping our clients with limited social pragmatic communication skills establish and maintain the type of friendship described above is a task fraught with challenges. There is no simple formula for making and keeping friends or sharing space effectively with others. There is no simple formula for anything that is social in nature. Instead, our students have to learn social thinking, social problem solving, and self-regulatory skills to be able to approach even the initial stages of adapting effectively with their same age peers.

The Research Thread

Before we can create effective treatment lessons for our students with social learning challenges, it is necessary to consider the complex fibers that weave together as part of EF to form the fabric of social learning. These include theory of mind (ToM) and central coherence (CC), among others.

Most SLPs are now familiar with the core concept of ToM and its relationship to perspective taking, narrative language, and conversation (Astington & Hughes, 2013; Hale & Tager-Flusberg, 2005; Spek, Scholte, & Van Berckelaer-Omnes, 2010). Central coherence (CC) theory, first described by Uta Frith (1989) in her book, *Autism: Explaining the Enigma*, describes how those with autism tend to have a specific weakness in their ability to form cognitive cohesion around central thought processes. In 2006, Happé and Frith further explained that weak CC represents a processing bias for local information (i.e., details) and a relative failure to extract the gist or see the big picture in activities of everyday life. We often describe our students as having a "conceptual learning disability" and some of the many challenges noted with students who lack CC are their difficulty maintaining a conversation, summarizing what they read in class, or sharing the main idea of a movie they enjoyed watching.

EF has long been considered a core fiber in the social learning fabric, yet it has received less direct attention over the years than these other two concepts. Today however, it is clear to us that EF involves active social thinking and self-regulation, and has a powerful role in all of our social processes and related social competencies. In the last 10 years, research has also established the interrelationship between EF, CC and ToM (Happé & Frith, 2006; Landa & Goldberg, 2005; Pellicano, 2010).

Barkley (2012) calls our attention to the important, but elusive, nature of defining EF. EF exists in the abstract and is difficult to define easily and to test empirically. Welsh and Pennington (1988) penned an early and often cited definition of Ef as "the ability to maintain an appropriate problem solving set for attainment of a future goal" (p. 201). They explain that this includes but is not limited to: (a) an intention to inhibit a response or to defer it to a later, more appropriate time; (b) a strategic plan of action sequences; and (c) a mental representation of the task, including the relevant stimulus information encoded in memory and the desired future goal-state. In their book, *Executive Function and Child Development*, M. Yeager and Yeager (2013) explore how working memory, response inhibition, shifting focus, cognitive flexibility, self-monitoring (which requires a basic level of self-awareness), and goal orientation are at the heart of academic success, social competencies, and emotional well-being.

Barkley (2010) adds in another key ingredient to success that stems from our executive functioning abilities: self-motivation. He asks us to consider: "If you can't motivate yourself, how can you persist?" and suggests that a lack of motivation combined with weaknesses in other elements described above, lead our students to have "exceptional nearsightedness about the future," or what we describe as being "stuck in the newness of now" (p. 56).

Research supports the idea that EF is an important contributor to cooperative social behavior in children (Best, Miller, & Jones, 2009; Ciairano, Visu-Petra, & Settanni, 2007) and that children with attention issues (including working memory) often have associated significant social issues (Kofler et al., 2011). EF and social abilities seem to go hand in hand. Rossano (2011) summed up the importance of linking social to EF constructs by stating that current and future "theories of cognitive control are likely to be seriously incomplete unless they incorporate relevant social/emotional factors" (p. 238).

Current thinking related to EF divides the concept into organizational and regulatory abilities (Heatherton & Wagner, 2011; UCSF Memory and Aging Center, 2012). The organizational EF aspects of friendship were explored earlier in this article. Less obvious, but equally important,

is how we use our EF abilities to regulate the social experience in face-to-face interactions to actively encourage others to want to be our friends or at least include us in group work activities.

The Tangle of Social Regulation and EF

Our social regulatory abilities refer to a combination of processes that are responsible for our purposeful, goal-directed, problem solving behavior (Gioia, Isquith, Guy, & Kenworthy, 2000). While it is easy to recognize that accomplishing a homework assignment is a goal directed activity, we are less familiar with thinking through goal directed activities that are social in nature, such as a student greeting people he passes at school. The goal is to appear friendly or approachable to select people on campus. Yet, even something that sounds quite "simple" requires problem solving at many different levels:

- Who to greet and who to ignore?
- What's the best way to greet the person – verbal, nonverbal, a combination of both?
- What's the context of the situation? Who is the person (peer, adult, principal?), what's the setting (hallway, bathroom, school grounds?), has the student already greeted the person that day?

Furthermore, making things even more complex, we have to recognize that we don't simply teach a person to greet another in one standard manner, but instead go through a progression of social greeting responses across each day that depend on the context and culture of the person. When we see someone for the first time we often verbally acknowledge him. "Hi," "What's up?" or "How are you?" are common verbal acknowledgements. As we verbally greet a person we simultaneously look at his or her face and offer a friendly facial expression as well as some type of physical gesture. This could include raising a hand to gesture "hi" or tossing your chin up in the air to accompany your verbal "What's up?" The second time we see the same person in the same day, we often remove the verbal greeting and just use the simultaneous eye contact, facial expression, and physical gesture. After that, if we see that person again we often act like something we're holding (such as a cell phone) or something on the floor or wall has stolen our social attention to avoid over-greeting people. Take a minute to think about this and you'll probably realize that we have uncomfortable thoughts about people who seem too zealous in acknowledging us every time with big social greetings. Greetings aren't all that simple, it seems! It's up to our students to judge the why, when, how, how much, and how often of a greeting. Now imagine the social EF thinking and actions involved in something even more complex, like asking someone out on a date, playing on the playground in a group, or working on a team project in class! For our students not born with auto-navigation of their social minds, this is more complex than learning trigonometry or advanced physics.

Unraveling the Social Learning and Self-Regulatory Connections

From a social perspective, all this is interesting to consider, but from a functional perspective, how do we possibly provide treatment to address all the needs wrapped into CC, ToM, and EF?

We begin by clearly defining what it means to be *social* and acknowledging that it is far more than establishing and maintaining friendships. Consider this definition we developed: a social behavior is anything a person does in the presence of others which can potentially lead others to have a thought and/or emotion about this person's social behavior and ultimately about the person.

Note that social behaviors do not necessarily require social interaction. For this reason we describe a "socially competent person" not only as one who interacts with others in a socially expected manner, but also as someone who shares space effectively even when not actively

engaged in reciprocal social interactions. Examples of sharing space effectively include sitting in a classroom quietly while a teacher is explaining a lesson, sharing the playground with others away from direct social interaction, standing in line, shopping in a store, etc.

We consider people who use "pro-social" skills to be those who are able to adapt their own behaviors to align with the social expectations of a given situation and what they know about the people within it. By adapting our social behaviors to do what is expected, we influence how and when people are paying attention to us. This, in turn, helps us control what people think and feel about us. Our organizational and regulatory EF abilities are front and center in these interactions, helping us problem solve our social encounters from start to finish.

What this means to those of us who work with students with social learning/EF challenges is that we have to develop treatment goals and related strategies that teach students how to regulate their own behavior in situations where they are *not* actively socially engaged with others, in addition to teaching them how to socially interact with others.

One barrier SLPs encounter to providing this two-pronged treatment is that our field tends to narrowly define social pragmatic skills as those that involve verbal language. Most of the tests we commonly use evaluate pragmatic language based primarily on the student's interpretation of what a person or group of people may mean by what they say or what they are doing based on the test item prompts. We then score these imagined responses without ever scoring how a student actually handles himself or herself in real time social situations, which can include the treatment or assessment room.

We have no tests in our field, or for that matter any related field (psychology, education, behaviorism), that measure how our students adapt —or don't adapt—their social behavior in the milliseconds to two seconds they have to respond to social stimuli to interact or share space effectively with others. So, how accurate are our test-based assessments?

Social competence is a judgment made by onlookers or social participants who are relating or sharing space with a student in the here and now. There can be a significant and compelling discrepancy between a student's score on a social pragmatic language-based test and how he or she adapts socially in real time. We (the authors) describe this gap by saying, "the student looks good on paper, but might not look as good in person." In our opinion this gap exists because the current set of tests used by SLPs to measure social pragmatics actually remove the need to use social and self-regulatory executive functions, while real time interactions demand the use of regulatory skills. For this reason, it is important for SLPs to recognize they cannot evaluate a student's true social competence with a standardized test!

So What Are We to Do?

First, recognize that social competency has everything to do with social and self-regulation, and that this is a judgment, not a test score. This is social EF!

Second, acknowledge the judges in our students' lives. The best assessors of a student's social competencies are his or her peers, not the parents and not we, the professionals. The peers are the real and best judges of whether or not, or to what extent, a student is socially competent, and they tend to be far more unforgiving than adults in their world.

Third, as professionals assessing a child's social pragmatic communication skills, take the time to understand the social competencies of same age peers, as well as the cultural and contextual norms for the school, community, or setting. If the student is 10, observe typically developing 10-year-olds to understand the level of expected social and self-regulation in order to better understand the socio-development norms for the student. This type of analysis aligns with the Common Core State Standards Initiative anchor standard for "Speaking and Listening" which states that students in grades K-12 should "prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing

their own clearly and persuasively" at the level expected of their same age peers (NGA Center and CCSSO, 2010).

Fourth, develop systematic methods to deconstruct abstract social concepts so as to teach from a solidly concrete base.

Deconstructing the Social Concepts to Develop Treatment Strategies

Baron-Cohen (2009) introduced his E-S theory that proposes that each person falls somewhere on an empathizing to systematizing spectrum. He contends many people are highly empathetic—some are a blend of empathetic as well as systematic in their approach to the world, and others are highly systematic without a strong empathetic base. On this basis, he postulates that individuals with significant social learning challenges (e.g., people on the autism spectrum, etc.) tend to be more systematic in how they navigate the world and therefore our treatments related to social concepts need to be more systematic to align with their learning style. The good news is that prior to publication of his now well-regarded theory, SLPs and autism specialists were moving in this direction for years.

Carol Gray's Social Stories™ (1993) were ground breaking in moving treatment for people with social learning challenges away from simply teaching "how to do" the correct skills (social skills training) toward teaching them how to systematically evaluate why a person would use the skill. Social Stories introduced a three paragraph process which involved exploring the social behavioral expectations in a situation (paragraph 1), how people think and feel when others do what is expected (paragraph 2), while helping students focus on demonstrating the expected behaviors (paragraph 3).

Social Thinking® (Winner, 2000), a treatment framework inspired in part by Gray's work, was introduced in an effort to explore teaching abstract social communication concepts and skills to individuals with solid language skills and verbal IQ. The focus of Social Thinking is to help students develop stronger social cognitive foundations to interpret others' intentions, as well as communicate more effectively through their own social behavioral responses.

At a core level of processing, it is our social thinking that helps us adapt our social behaviors effectively so that people react and respond to us in the manner we had hoped. We think of social thinking as the social engine that helps us navigate socially and at the same time, teaches us about the larger social world. In turn, this helps not just in social situations, but also with reading comprehension of literature, narrative language for written expression, and in other academic tasks (Winner & Crooke, 2009a).

The Social Thinking® conceptual framework is put into practice through the use of a wide variety of systematic social teaching tools that deconstruct abstract social concepts into more specific and relatable lessons. For example, rather than expect our literal students to grasp the abstract concepts like *cooperate*, *negotiate*, and *respect*, we developed Social Thinking Vocabulary that include: *think with your eyes, keep your body in the group, keep your brain in the group, follow the plan*, be a *thinking of you kid* rather than a *just me* kid (Winner, 2005). Other Social Thinking frameworks explore these and other social concepts more deeply and are not within the scope of this paper, but interested readers are encouraged to explore other social thinking concepts and strategies such as: The Four Steps of Communication, The Four Steps of Perspective Taking, the Peer-a-Mid of Friendship, and The Spirals of Success and Failure (Winner, 2007a; Winner & Crooke, 2009b).

Our students also struggle with core understanding of their own and others' emotions. Tony Attwood's strategies to systematize emotional learning (2004) provide key stepping stones toward social emotional self-regulation. It is also important to recognize that our social emotional behaviors are not static but evolve with age; it is expected that the manner in which people express their emotions also evolves. While a preschool or kindergarten student can get away with

being mad and showing it, adolescents are considered threatening if they show strong signs of anger when in a school, community, or workplace. In our work, we describe this decrease in tolerance toward extreme expression of emotions as people age as "emotional expression compression" (Winner & Crooke, 2011) and we teach tweens/teens about their own emotions and how and when to regulate them. Through the use of comics and targeted lessons, students are encouraged to "feel it big on the inside, express it small in public" and annotate it as "FBI-ESP" (Crooke & Winner, 2011).

One of our more comprehensive teaching tools is Social Behavior Mapping (SBM; Winner, 2007b), which was developed to help teach our students social cause and effect through exploring how each of our social behaviors impact how others feel, which affects how they treat us and in turn, how we feel about ourselves. Using a systematized and visual graphics approach, adults guide students through the SBM process by first identifying a situation to explore the *expected* social behaviors (p. 1) and *unexpected* behaviors (p. 2) associated with it. Each page contains four columns. Column 1 details the expected or unexpected behaviors in that context, column 2 encourages the user to list how people feel in response to another person's social behaviors, column 3 requires students to explain how people are likely to respond to these social behaviors based on how they feel, and column 4 encourages the user to explore how the person who produced the social behavior now feels based on how he or she was treated by these other people. The tool directly teaches social responsibility by systematically explaining that what you do affects how others feel, which affects how they treat you, which affects how you, yourself feel. This then leads to a social boomerang effect: if you end up feeling angry because of how someone treats you, it is likely you will produce more negative social behaviors, which sets off another chain reaction to map on the SBM. Like many Social Thinking teaching concepts, SBM's have been used broadly in middle and high school to help illuminate the steps involved in social executive functioning and the related social-emotional regulation (refer to http://www.socialthinking.com/what-is-social-thinking/social-behavior-mapping to access a blank social behavior map and instructions for how to use with clients).

Summary

EF is woven throughout the social learning process and is critical to consider as we plan treatment strategies for clients or students on our caseloads with autism spectrum disorder (ASD), attention deficit disorder (ADD/ADHD), brain injury, language disorder, nonverbal learning disorder (NVLD), behavioral or emotional disability—all of whom often experience difficulty with both social learning and EF skills. And, this connection isn't just common sense; it's substantiated in the literature. Yet when we think of providing EF oriented treatment, we routinely generate strategies to teach *organization* and planning related to academics, homework, and completing tasks—with little if any emphasis on social. To help our students develop more sophisticated social-emotional competencies to improve their social pragmatic communication skills, SLPs have to explore the *role of EF at the social level*, and how it intersects with perspective taking/theory of mind and central coherence theory. With this awareness, we can then adapt our teaching strategies to systematically deconstruct the social experience for our students with social learning challenges and help them develop cognitive, as well as social skills to meet their goals.

References

Astington, J. W., & Hughes, C. (2013). Theory of mind: Self-reflection and social understanding. In P. D. Zelazo (Ed.), *Oxford Handbook of Developmental Psychology*. New York, NY: Oxford University Press.

Attwood, T. (2004). *Exploring feelings: Anger: Cognitive behaviour therapy to manage anger*. Arlington, TX: Future Horizons, Inc.

Barkley, R. (2010). *Taking charge of adult ADHD*. New York, NY: The Guilford Press.

Barkley, R. (2012). *Executive functions: What they are, how they work and why they evolved*. New York, NY: The Guilford Press.

Baron-Cohen, S. (2009). Autism: The empathizing-systemizing (E-S) theory. *Annals of the New York Academy of Sciences*, *1156*, 68–80.

Best, J. R., Miller, P. H., & Jones, L. L. (2009). Executive functions after age 5: Changes and correlates. *Developmental Review*, *29*(3), 180–200.

Ciairano, S., Visu-Petra, L., & Settanni, M. (2007). Executive inhibitory control and cooperative behavior during early school years: A follow-up study. *Journal of Abnormal Child Psychology*, *35*, 335–345.

Crooke, P., & Winner, M. G. (2011). *Social fortune or social fate*. San Jose, CA: Think Social Publishing, Inc.

Frith, U. (1989). *Autism: Explaining the enigma*. Massachusetts: Basil Blackwell, Inc.

Gioia, G. A., Isquith, P. K., Guy, S. C., & Kenworthy, L. (2000). *The behavior rating inventory of executive function*. Lutz, FL: Psychological Assessment Resources.

Gray, C., & Garand, J. (1993). Social stories: Improving responses of students with autism with accurate social information. *Focus on Autistic Behavior*, *8*, 1–10.

Hale, C., & Tager-Flusberg, H. (2005). Social communication in children with autism: The relationship between theory of mind and discourse development. *Autism*, *9*(2), 157–178.

Happé, F., & Frith, U. (2006). The weak coherence account: Detail-focused cognitive style in autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *36*(1), 5–25.

Heatherton, T. F., & Wagner, D. D. (2011). Cognitive neuroscience of self-regulation failure. *Trends in cognitive sciences*, *15*(3), 132–139.

Kofler, M. J., Rapport, M. D., Bolden, J., Sarver, D. E., Raiker, J. S., & Alderson, R. M. (2011). Working memory deficits and social problems in children with ADHD. *Journal of abnormal child psychology*, *39*(6), 805–817.

Landa, R., & Goldberg, M. C. (2005). Language, social, and executive functions in high functioning autism: A continuum of performance. *Journal of Autism and Developmental Disorders*, *35*(5): 557–573.

National Governors Association Center for Best Practices, Council of Chief State School Officers. (2010). *English language arts standards>> Anchor standards>> College and career readiness anchor standards for speaking and listening*. National Governors Association Center for Best Practices, Council of Chief State School Officers, Washington, D.C.: Authors. Retrieved from http://www.corestandards.org/ELA-Literacy/CCRA/SL

Pellicano, E. (2010). Individual differences in executive function and central coherence predict developmental changes in theory of mind in autism. *Developmental Psychology*, *46*(2), 530–544.

Rossano, M. (2011). Cognitive control: Social evolution and emotional regulation. *Topics in Cognitive Science*, *3*(2), 238.

Spek, A. A., Scholte, E. M., & Van Berckelaer-Omnes, I. A. (2010). Theory of mind in adults with HFA and Asperger syndrome. *Journal of Autism and Developmental Disorders*, *40*(3), 280–289.

UCSF Memory and Aging Center. (2012). *"Frontotemporal Dementia: Executive Functions"*. Retrieved October 18, 2013 from http://memory.ucsf.edu/ftd/overview/biology/executive/single

Welsh, M. C., & Pennington, B. F. (1988). Assessing frontal lobe functioning in children. Views from developmental psychology. *Developmental Neuropsychology*, *4*(3), 199–230.

Winner, M. G. (2000). *Inside out: What makes a person with social cognitive deficits tick?* San Jose, CA: Think Social Publishing, Inc.

Winner, M. G. (2005). *Think Social: A social thinking curriculum for school-age students*. San Jose, CA: Think Social Publishing, Inc.

Winner, M. G. (2007a). *Thinking about you thinking about me* (2nd ed.). San Jose, CA: Think Social Publishing, Inc.

Winner, M. G. (2007b). *Social behavior mapping*. San Jose, CA: Think Social Publishing, Inc.

Winner, M. G., & Crooke, P. (2009a). Social thinking: A developmental treatment approach for students with social learning/social pragmatic challenges. *Perspectives on Language Learning and Education*, *16*(2), 62–69.

Winner, M. G., & Crooke, P. (2009b). *Socially curious and curiously social*. San Jose, CA: Think Social Publishing, Inc.

Winner, M. G., & Crooke, P. (2011). *Social thinking at work: Why should I care?* San Jose, CA: Think Social Publishing, Inc.

Yeager, M., & Yeager, D. (2013). *Executive function & child development*. New York, NY: W.W. Norton.