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DISCUSSION AND REVIEW PAPER

Social Thinking® Methodology: Evidence-Based or Empirically Supported? A Response to Leaf et al. (2016)

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The purpose of this article is to address several misconceptions and inaccuracies that were advanced in the article "Social Thinking®: Science, Pseudoscience, or Antiscience? (Leaf et al., 2016a; Erratum: Leaf et al., 2016b). These misconceptions have created an opportunity to discuss an issue of great importance to those who treat individuals diagnosed with social communication challenges including, but not limited to, autism spectrum disorders (ASD). That issue is the question of what do we mean by "evidence-based practice" or as Leaf and colleagues have cast it, the science of intervention. Because the Leaf et al. (2016a) article focused entirely on Social Thinking® (ST)[1] for their arguments, we will start by defining the methodology, and then offer an alternative viewpoint to this important issue.

Social Thinking is a therapeutic methodology that was designed to complement and add to other approaches or frameworks for working with individuals with social communication challenges. It is not one single approach, nor is it one single set of procedures. Rather, ST is a methodology upon which empirically supported research-based practices (e.g., modeling, naturalistic intervention, reinforcement, visual supports) can aggregate into specific strategies (e.g., establishing reciprocity, initiating social contact, utilizing problem-solving), via lessons, and activities for implementation. For instance, many of the lessons and activities within the methodology utilize *thought bubbles* for teaching theory of mind, mental states, and understanding thoughts; a strategy well-documented in the literature (Kerr & Durkin, 2004; Parsons & Mitchell, 1999; Paynter & Peterson, 2013; Wellman et al., 2002). Another example is the use of structured lessons and activities that emphasize visual attention for teaching gaze direction for joint attention and social problem-solving (Frischen, Bayliss, & Tipper, 2007; Hendrix, Palmer, Tarshis, & Winner, 2013; Kaale, Smith, & Sponheim, 2012; Winner & Crooke, 2008; Wong & Kasari, 2012).

Further, the ST methodology is grounded in what is currently known about individual needs for those with social communication challenges (e.g., joint attention, inferencing, theory of mind) (Baron-Cohen, 2000; Charman et al., 2000; Hughes & Leekam, 2004; Landa, Klin, & Volkmar, 2000; Mundy, Sigman, & Kasari, 1994; Norbury & Bishop, 2002, Tomasello, 1995). And while the various therapeutic protocols and frameworks comprising the methodology were developed and are supported by these and other strong theoretical underpinnings (Crooke & Winner, 2015), many of the implementation strategies share the core tenants of both behavioral and cognitive behavioral theories. For example, the ST methodology teaches that treatment should begin with *identification* or *discrimination* of the desired target or concept; however, we utilize the terminology of *social observation* and *thinking with eyes* and *smart guess* (Winner & Crooke, 2008; Hendrix et al., 2013; Zweber-Palmer, Tarshis, Hendrix, & Winner, 2016) to parallel these well-documented behavioral concepts. The ST methodology also promotes the use of naturalistic reinforcement, motivation, self-regulation and social validation for

[1] We typically refer to the process of thinking socially, and the cognitive acts and related production of social skills (behaviors) that this subsumes, as *social thinking* (lowercase), whereas the formal methodology based on these concepts is referred to as Social Thinking® (uppercase).

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generalization, all key components in Pivotal Response Therapy (Koegel, Koegel, Harrower, & Carter, 1999), and other behaviorally (and cognitive-behaviorally) focused interventions. Our intention is to provide a methodology to interpret and apply this foundation of research into easily digestible and usable concepts, strategies, and vocabulary for key stakeholders.

Evidence-Based Practices vs. Empirically Supported Therapies

This description of ST reflects our orientation that the methodology is based on a solid foundation of theory as well as the research that supports the theory. The ST methodology also represents an excellent context for clarifying the now well-established distinction between evidence-based practices (EBP) and empirically supported therapies (EST) (La Roche & Christopher, 2009; Westen, Novotny, & Thompson-Brenner, 2005; Wong et al., 2015). Important to note is that the term EBP is *not* synonymous with EST (Westen et al., 2005) as implied by Leaf et al. (2016a). Evidence-based practices are defined as those practices based on the best available research combined with clinical expertise and stakeholder input (APA, 2006; ASHA, 2005; Dollaghan, 2007; Kazdin, 2008; NAC, 2011). EBPs still represent highly rigorous evidentiary levels, but are considered more plausible in representing practice in everyday settings. The criteria for ESTs differs from EBPs in that ESTs are defined as treatments that have achieved a level or threshold of multiple experiments and publications (either via RCTs or a series of rigorous single subject designs) with experimental control on a distinct set of manualized procedures within a well-defined population—not necessarily conducted by the creators of that treatment (Flay et al., 2005). Per Westen et al. (2005), in most cases, this represents an overly restrictive evidentiary standard that can typically only be applied to that particular distinct set of procedures and is *not* readily applicable to the sort of complex methodologies, consisting of a variety of procedures (i.e., strategies, lessons, and activities), usually seen in real world practice. Social Thinking has *never* made claim to being an EST. Rather, the widely accepted three-pronged definition of EPB (available research, clinical expertise combined with stakeholder input) better reflects the ST methodology and its philosophy.

Contrary to what was implied in the Leaf et al. (2016a) article, the creators of ST *do* indeed understand and appreciate the value of empirical evidence to support processes and outcomes. Further, we acknowledge the need for more empirical evidence regarding treatment of individuals with social communication problems and, in particular, outcome studies related to the ST methodology. Our peer-reviewed publications to date have focused on defining the conceptual orientation of ST and components of the methodology (Crooke, Winner, & Olswang, 2016; Crooke & Olswang, 2015, Winner & Crooke, 2014; Winner & Crooke, 2009). Three additional peer-reviewed publications (Lee et al., 2015; Koning, Magill-Evans, Volden, & Dick, 2008; Crooke, Hendrix, & Rachman, 2008) combined with four pilot outcome studies (Bolton, 2010; Clavena-Deane, 2010; Taylor, 2011; Yadlosky, 2012) have provided *preliminary* data about the potential benefits of individual components of ST. To that end, we are currently conducting outcome research on specific frameworks and curricula within the ST methodology and partnering with others on a global level in this process. Understanding the types of therapeutic protocols and frameworks that can bring about change for the diverse population of individuals with social communication challenges is foremost in our minds.

Points of Clarification and Source Text

Leaf et al. (2016a) make occasional statements about the ST methodology and our beliefs that were not attributed to any particular source, assign implication without context, and make speculations which seem particularly erroneous.

For example, the authors state, "it is clear that proponents of Social Thinking do not believe that science is important in making treatment decisions" (p. 155) and "proponents of Social Thinking may believe it would be difficult to evaluate their procedures utilizing the scientific method and that it should be abandoned" (p. 155). By "proponents," Leaf et al. seem to imply the authors of ST. We cannot speak to what other proponents believe, but we can clarify our own beliefs. The authors of ST do not believe that data, science, or scientific methods should be abandoned, but rather, we have argued that professionals should critically examine their own practices, clearly define the parameters, and question assumptions using data-driven decision-making. And, that consideration of clinical expertise and stakeholder input/values occur concurrently, as defined by EBP.

To support this argument, Leaf et al. reported that "Winner has stated that when we start off by conducting research, 'We have put the proverbial cart before the horse in being asked to provide scientifically rigorous evidence for an area that remains highly subjective and open to interpretation in every facet of its application'" (p. 155). This excerpt comes from a summation paragraph associated with several pages of text and seven questions to challenge the reader to be a critical consumer when analyzing assessment and treatment options for a range of differing types of learners. The original text connotes something quite different than what Leaf et al. implied:

> How can we assess an area – social thinking and related skills – that's never been clearly defined, in a population of individuals – those with ASD and related disabilities – that have no common grouping upon which research can be based? *We have put the proverbial cart before the horse in being asked to provide scientifically rigorous evidence for an area that remains highly subjective and open to interpretation in every facet of its application*. Nevertheless, many of us continue to pursue the development of treatment methodologies that can be shown to be effective through research methods developed for more individualized instruction, such as Single Subject Designs (Winner, 2013, p. 229–230, italics added).

Leaf and colleagues continued their argument that ST rejects research by extracting the following from Winner (2007a, b): "Winner has also made claims that 'we cannot research whether or not we made people think more about other people'" (p. 155). However, the original source text immediately following this sentence states:

> However, we can study the overall qualitative outcomes. Do others feel more comfortable in our student's presence? Are our students able to hold a job more successfully? Can they participate as part of a group with greater success? *We absolutely need a series of long-term studies to answer these questions* (p. 38, italics added).

The authors concluded their argument by stating that "Finally, Winner has stated that we should consider moving away from sciences with the following statement: 'If our goal is to determine the best or most promising practices, we need to consider more than the best scientific evidence'" (p. 155). Not quoted was Winner's subsequent comment that tells the reader what to consider along with the best scientific evidence, as defined by EBP:

> *If our goal is to determine the best or most promising practices, we need to consider more than the best scientific evidence*. Social Skills play out in the "real world," one that involves family/client values, cultural differences, economic backgrounds, not to mention the clinician's experience in the field itself, and any preconceptions and perceptions that the clinician brings to the experience (Winner, 2008, pg. 107, italics added).

This comment from Winner (2008) is not anomalous. Other statements that support data-driven decision-making from the viewpoint of the ST methodology include

> Our job, as the educators and clinicians who take on the responsibility of designing such programs, is to continually investigate and question existing assumptions about persons with ASD and the manner in which we teach and treat them. If we seek evidence-based practices for teaching social skills and social thinking, *our first step is to thoroughly define the issue, then use this information to formulate intervention strategies. In essence, we need to apply the principles of behavior analysis to our own actions, and "take data" on whether or not our teaching methods are achieving real success* (Winner, 2008 p. 16–17, italics added).
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> No matter how we think about this job before us, evidence-based practice implies that constant review and analysis will be necessary as these programs emerge, are tested, and retested (Winner, 2008, p. 17).

The fact is that, contrary to what Leaf et al. claimed, we are supportive of data, research, and science. We are highly critical of our own clinical data and skeptical of educational or therapeutic communities who suggest quick change in symptom abatement without accompanying objective data. Our commitment to science is apparent by our ongoing efforts to recruit independent research projects and participants for empirical studies related to four core manualized and semi-manualized curricula (see https://www.socialthinking.com/research), as well as our latest published research focusing on examining the impetus for practitioner uptake and engagement in specific components of the methodology (Crooke & Olswang, 2015).

When discussing the merits and importance of ST, Leaf and the team also contend that "Winner provides unfounded claims, such as, 'The only teaching approach that appears to be of real help is cognitive behavior therapy'" (p. 154). The actual source text is in reference to individuals diagnosed with ADHD, bipolar, NLD, emotional challenges, and ASD who possess high levels of language and intelligence and who frequently struggle with organization, perspective taking, and mental health:

> *The only teaching approach that appears to be of real help is cognitive behavior therapy.* These lessons teach our students to think through a concept prior to the behavior (skill) being taught. While many of our clients need mental health counseling, cognitive behavioral counseling is a more practical approach than insight-oriented therapy used by many therapists (Paxton & Estay, 2007) (Winner, 2007a, b, p. 12, italics added).

Finally, Leaf et al., drawing upon Green's (1996) definition of pseudoscience, stated that methodologies such as ST "claim they can produce high levels of success quickly across a variety of disorders" (p. 152) and "state that proven therapies are unnecessary, harmful, or inferior with no objective proof to support their claims" (p. 153). Regarding claims of rapid effects, Winner has, across a number of publications, stated the opposite, including:

> Learning social thinking and related social skills is a *slow process*. Attempting to speed up the learning by writing overly optimistic 12-month treatment goals can accidentally discourage the student and his educational team (Winner, 2013, p. 205, italics added).
> To imply that social skills can be learned *swiftly and seamlessly, when that's not the case*, ultimately leaves parents, students, and other professionals with a sense of frustration and hopelessness (Winner, 2013, pg. 84, italics added).

Regarding the value of other therapies, Winner and ST have consistently stated the importance of *individualizing* practices to the needs of the *individual*, rather than the adoption of one therapy or approach for all or based solely on diagnosis.

> ABA has proven to be successful in helping children with autism develop increased basic social competencies (Winner, 2013, p. 11).
> Because it has empirical research to support its efficacy, ABA is considered a sound teaching methodology to use with individuals with ASD-SCD (Winner, 2013, p. 11).
> A strong focus on *behavioral teaching methods* (i.e., applied behavior analysis) will be the most effective with this subset of students" (Winner, 2007a, b, pg. 6, italics added).
> Professionals and researchers are beginning to demonstrate that CBT can be promising in the treatment of persons who function high on the autism spectrum and those with related social learning processing disabilities (Anderson & Morris, 2006; Beebe & Risi, 2003; Gaus, 2007; Kuusikko et al., 2008; Lopata, Thomeer, Volker, & Nida, 2006; Sofronoff, Attwood, & Hinton, 2005) (Winner, 2013, p. 86).
> Effective strategies arise from several sources: naturalistic behavioral treatment techniques (Koegel et al., 1999), social emotional strategies as part of the SCERTS model (Prizant, Wetherby, Rubin, Laurent, & Rydell, 2006), relational therapies (Wolfberg, 2003; Greenspan/DIR, 2003; Gutstein/RDI, 2001), Social Stories, (Gray, White, & McAndrew, 2002) or Social Behavior Mapping and other social thinking and related social skills (Winner, 2007b) (Winner, 2008, p. 107).

To summarize, Leaf and colleagues (2016a, b) have used the Social Thinking methodology as a vehicle to discuss the important topic of evidence in clinical practice, particularly for treating individuals with social communication challenges including, but not limited to, Autism Spectrum Disorders (ASD). We were dismayed by their decision to target one clinical methodology for conducting this discussion, but more significantly, we were troubled by the numerous misconceptions and inaccuracies that were stated in the article. The above quotes and responses are meant to illustrate our major concerns; they certainly do not capture, nor address, all of the errors.

The topic of evidence in practice is too important to treat speciously. We therefore have attempted to clarify a sampling of the misconceptions and misrepresentations about the ST methodology in an attempt to address this topic more factually. Serving individuals with disabilities requires that practitioners consider the evidence that is available. Evidence can come in many forms, including research relevant to foundational theories underlying a therapeutic approach or empirical evidence on the particular therapeutic approach itself. Our hope moving forward is that clinicians, professionals, and families will be independent and thoughtful consumers of all evidence-driven practices. Ideally, optimum service delivery should consider not only the external database evidence but also clinician expertise in concert with their own observations and data, placed within the context of the individual needs of clients and their families. To dictate that only one approach, therapy, or methodology for providing services to a population of individuals with diverse characteristics is appropriate does not reflect good science (which is, by design, a progressive, iterative process) nor does it represent best practices for individuals with ASD and related social learning challenges, or their families.

Compliance with Ethical Standards

Conflict of Interest Dr. Crooke is a full-time salaried employee of Think Social Publishing, Inc. While a contributing author on various books, articles, and papers, she receives no royalties.

Michelle Garcia Winner is the founder of the Social Thinking methodology and CEO of Think Social Publishing, Inc.

Ethical Approval This article does not contain any studies with human participants performed by any of the authors.

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