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Exposure and response prevention therapy with cognitive defusion exercises to reduce repetitive and restrictive behaviors displayed by children with autism spectrum disorder

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ABSTRACT

Repetitive and restrictive behaviors are disruptive in children with autism spectrum disorder. Exposure is an evidence-based approach to these problems and is hypothesized to work in part by enabling rule testing that undermines rule control. The present study undermined rule control more directly through cognitive defusion exercises. Experiment 1 used a multiple baseline across participants design to assess the effects of a cognitive defusion exercise in the form of word repetition and exposure on problem behavior associated with repetitive and restrictive behaviors observed in children with autism spectrum disorder. All 3 participants demonstrated a decrease in the percentage of problem behavior following the implementation of treatment which remained at near zero during a 3-month follow-up. Experiment 2 used an alternating treatments design to compare a cognitive defusion exercise and exposure to a control exercise and exposure. All except 1 of the participants displayed larger and quicker decreases in problem behavior during the cognitive defusion exercise condition compared to the control exercise condition. The results suggest that cognitive defusion exercises can enhance the treatment effects of exposure to decrease problem behavior associated with repetitive and restrictive behaviors.

The presence of repetitive and restrictive behaviors is a core feature of Autism Spectrum Disorder (ASD; American Psychiatric Association, 2013). The level of complexity of behaviors included in the repetitive and restrictive category ranges from simple discrete repetitive motor and vocal stereotypy to complex rituals and routines. Complex or high-order repetitive and restrictive behaviors have been described as rigidities and rituals, insistence on sameness, difficulty with transitions, and circumscribed interests (Lewis & Bodfish, 1999; Turner, 1999). Despite being a core area of ASD, research in the area of assessment and intervention for high-order repetitive and restrictive behaviors is quite sparse compared to other features of ASD (Bodfish, 2004; Turner, 1999).

High-order repetitive and restrictive behaviors have been referred to as "obsessive" and "compulsive," but because many individuals with ASD are unable to describe private events reliably, it is difficult to assess the behavior as foreign or

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unwanted, which is a core feature of obsessive–compulsive disorder (Zandt, Prior, & Kyrios, 2007). There are topographical differences between the high-order repetitive thoughts and behaviors reported with ASD and the thoughts and actions associated with obsessive–compulsive disorder. Those with OCD are more likely to report repetitive thoughts with aggressive, contamination, sexual, religious, symmetry, and somatic thematic content, and to engage in compulsive checking, cleaning, and counting. Those in the ASD group are more likely to report repetitive thoughts with a need to know or remember and hoarding content; repetitive behaviors are more likely than thoughts and consist of repetitive ordering, hoarding, touching, tapping, rubbing, self-damaging, self-mutilating, and telling or asking (Farrugia & Hudson, 2006). Nevertheless, repetitive and restrictive behaviors are associated with high levels of anxiety (Tantam, 2000; van Steensel, Bögels, Perrin, 2011), suggesting that they may serve similar functions as behaviors observed with OCD.

Exposure with Response Prevention (ERP) has the largest overall effect size in the treatment of OCD (for a review see Rosa-Alcázar, Sánchez-Meca, Gómez-Conesa, & Marín-Martínez, 2008). Despite the success of ERP, there are often high rates of treatment refusal and dropout (Abramowitz, Taylor, McKay, 2009). Similarly, research examining the use of prevention or interruption of repetitive and restrictive responses with ASD has demonstrated that increases in aggression and disruption can occur and be reinforced by access to rituals and routines (Hausman, Kahng, Farrell, & Mongeon, 2009; Kuhn, Hardesty, & Sweeney, 2009). Thus, there is a need for additional treatment elements to be developed that reduce problematic behaviors (e.g., aggression, disruption, tantrums) during ERP in the ASD population while maintaining the impact of ERP.

One possible element might be to find alternative ways to target the key processes of change in ERP. Exposure can be defined as "the organized presentation of previously repertoire-narrowing stimuli in a context designed to ensure repertoire expansion" (Hayes, Strosahl, & Wilson, 2012; p. 284). One means by which repertoire expansion may occur is through contact with contingencies that go beyond the rules derived by the individuals engaging in obsessive–compulsive behavior. For example, an individual may have derived the rule, "If I do not follow this routine, something horrible will happen." By exposing the individual to activities alternative to the routine, the domination of this rule over action may be reduced.

Another way of producing that effect is suggested by Relational Frame Theory (RFT; Hayes, Barnes-Holmes, & Roche, 2001). According to RFT, the behavioral impact of verbal rules can be changed either by altering the *form* or *function* of verbal networks through the use of relational cues. Cognitive defusion exercises such as those used in Acceptance and Commitment Therapy (ACT; Hayes et al., 2012) attempt to apply this idea to practical contexts by altering functional contextual cues so that verbal events are not taken literally, thus undermining the automatic behavior regulatory impact of verbal events. Consider the verbal rule: "In 60 seconds, this box will explode." If that line is said by an actor on a stage, no one in the audience is likely to run from the theater. If it is said by a terrorist who stormed into a house, victims might indeed attempt to run or grab the box and throw it out the window. The difference is not to be found in what the words mean; the local relational networks they occasion are nearly identical. The difference is in functional cues (i.e., terrorist versus actor) that support a transformation of stimulus functions from the before–after relation and the term "explode." These function in turn to motivate escape or avoidance actions.

If we return to our parallel example of obsessive thinking, as in, "If I do not follow this routine, something horrible will happen," we can apply RFT thinking by deliberately establishing cues that help the person notice their unfolding process of thinking in a nonthreatening context. Functionally speaking, this would be more like being a theater attendee than a terrorist victim. A person might sing, "Something horrible will happen," as if in a musical production, or say it in a silly voice, such as that of Mickey Mouse, evoking the functions of songs or cartoons. The words might be said very slowly, evoking their auditory properties and diminishing the dominance of meaning that is entirely dependent on derived relational responding. The thought, "Something horrible will happen," might be said in a child's voice, evoking compassionate understanding, or it might be written on leaves and allowed to float by, evoking dispassionate observation.

One of the simplest and most studied defusion methods was originally suggested by Titchener (1916, p. 425): repeating a single word aloud until the context needed for the word to have literal meaning diminishes. This procedure has been demonstrated to be effective at reducing emotional discomfort and believability with contamination-related thoughts (Watson, Burley, and Purdon, 2010) and other negative self-referential statements (Masuda, Hayes, Sackett, & Twohig, 2004; Masuda, Feinstein, Wendell, & Sheehan, 2010; Masuda, Twohig, et. al., 2010). All defusion techniques use functional cues to reduce problematic transformation of stimulus functions that are entirely dependent on a derived relational network and the beliefs they instantiate, and instead establish a broader set of functions such as observation, appreciation, humor, compassion, play, curiosity, and so forth. The present study examined the impact of ERP, when used with a combination of word repetition and saying thoughts in a silly voice, on problematic repetitive behaviors of children diagnosed with ASD.

1. Experiment 1

1.1. Participants and setting

Three participants were included in this study. Participants were referred to the Center for Autism, Research, Evaluation, and Service (CARES) for behavioral intervention services regarding behavioral excesses and deficits associated with ASD. Eligibility for the study was determined by interviewing the participant's primary caregiver and conducting direct observation. All participants were diagnosed with ASD and engaged in behavioral excesses associated with at least one of the following categories: (a) difficulty with transitions/change or the presence of novel stimuli (e.g., changing from one activity to another, presence or absence of a person, presence of particular objects), (b) insistence on performing tasks in a