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Acceptance: A Research Overview and Application of this Core ACT Process in ABA

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Abstract

Acceptance describes mediating behaviors in which an individual reduces escape and avoidance behaviors in response to unwanted private events while also encouraging increased appetitive control. Given the recent resurgence of interest in Acceptance and Commitment Therapy/Training (ACT) in ABA, a review of this core treatment process is warranted. Acceptance enjoys strong empirical support within the psychological and contextual behavioral science literatures, with treatment outcome studies, self-report measures research, and behavioral laboratory tasks all supporting the process. A review of select publications in behavior analytic journals found that acceptance also enjoys preliminary evidence of effectiveness across a variety of populations and problem behaviors in ABA. An application of acceptance in an ABA context is discussed, and recommendations for a more functional approach to acceptance and other ACT processes is offered. Acceptance interventions fall within the scope of practice of ABA in several contexts and are of relevance to mainstream ABA practitioners.

Keywords: acceptance, acceptance and commitment therapy, acceptance and commitment training, experiential avoidance, negative reinforcement, clinical behavior analysis

Acceptance: A Research Overview and Application of this Core ACT Process in ABA

Acceptance is a key process of change within Acceptance and Commitment Therapy/Training (ACT), and it is one of the most researched facets of the psychological flexibility model that underlies ACT (Hayes, Strosahl, & Wilson, 2012). Acceptance and ACT are not new, with early experimental and conceptual work appearing in behavior analytic journals in the 1980s and 1990s (Hayes & Wilson, 1994; Zettle & Hayes, 1986). Despite its intellectual origins in behavior analysis, the majority of the development and dissemination of ACT over the past 30 years has occurred outside of behavior analysis in the broader clinical psychology and contextual behavioral science (CBS) literatures. Recently, however, there has been a resurgence of interest in ACT within applied behavior analysis (ABA) with an emphasis on mainstream ABA applications of acceptance and ACT (Tarbox et al., 2020).

In this review I will provide an overview of acceptance within ACT ABA interventions. After brief consideration of psychological definitions of the term, I will provide contemporary behavioral accounts of acceptance within the ABA literature. I will then offer an overview of evidence supporting acceptance in the broader psychology and CBS literatures before more thoroughly reviewing a select sample of recent ACT interventions in ABA that included acceptance. In addition, I will offer a case example to explore applications of acceptance as both a technique and functional approach to intervening on problematic escape behaviors. Finally, I will briefly explore the relationships between acceptance and other facets of the psychological flexibility model.

Conceptual Accounts of Acceptance

The developers of ACT define acceptance as, “the voluntary adoption of an intentionally open, receptive, flexible, and nonjudgmental posture with respect to moment-to-moment experience” (Hayes, Strosahl, & Wilson, 2012, p. 272). However, it is just as common in the literature to see acceptance defined in relation to its opposite process, experiential avoidance. Experiential avoidance is defined as occurring, “when a person is unwilling to remain in contact with particular private experiences (e.g., bodily sensations, emotions, thoughts, memories, behavioral predispositions) and takes steps to alter the form or frequency of these events and the contexts that occasion them” (Hayes et al., 1996, p. 1158).

Simply distilled, acceptance is viewed in the psychological literature as a willingness to experience private events without engaging in behavior intended to change them or the situations where they occur. A central assumption of this account is that efforts to change unwanted private events (e.g., thoughts, emotions, and bodily sensations) are a driving force of psychopathology, and that acceptance offers a more psychologically flexible and adaptive way of relating to difficult private events (Hayes, Strosahl, & Wilson, 2012., 2012). That is, willingly and openly experiencing uncomfortable thoughts and emotions may allow someone to engage in meaningful behaviors and live more fully and freely in their world.

This mid-level account of acceptance has been fully embraced within the psychology and CBS literatures. Hundreds of psychological studies have referred to acceptance as opening up, making room for, engaging with, living with, allowing, making peace with, having, or otherwise experiencing private events without engaging in efforts to remove, resist, alter, control, regulate, push away, or otherwise change them. While these accounts of acceptance have been useful in guiding the behavior of psychologists and other researchers and clinicians, they have also been subject to criticism within behavior analysis. This resistance is understandable, as the guiding dimensions of conceptually systematic, technological, and behavioral within ABA caution against the adoption of new terms (Cooper et al., 2020).

Mid-level terms such as acceptance have broad scope (i.e., can be easily applied across a broad range of contexts) but lack precision (i.e., clear definitional boundaries with as few terms as possible used to explain a specific environment-behavior interaction; Hayes, Barnes-Holmes, & Wilson, 2012). Acceptance is used interchangeably in the literature as a psychological process (e.g., “acceptance” as one of six facets of the psychological flexibility model), a topographical procedure (e.g., an “acceptance” intervention script), and as a behavioral repertoire (e.g., behavior analysts should prompt and reinforce “acceptance” when unwanted private events are present). Consequently, the use of the term will vary across these levels throughout this review as a function of the literature being discussed (though I endeavor to be as clear as possible as to how I use the term in each section). Acceptance also has “fuzzy” boundaries with other mid-level terms in the psychological flexibility model; consequently, readers

seasoned in ACT will recognize that many of the examples of acceptance in this review can also be considered as instances of other facets of psychological flexibility.

The flexible and fuzzy nature of mid-level terms like acceptance allows them to have broad scope and utility in informing the work of researchers and applied practitioners across multiple disciplines, including behavior analysts. The tradeoff is that acceptance is not currently a technical behavioral term, and as such does not currently enjoy the same level of precision as terms commonly used in behavior analysis (e.g., reinforcement; Hayes, Barnes-Holmes, & Wilson, 2012). Consequently, acceptance should be considered as an interdependent facet of psychological flexibility and not as a distinct behavioral process or repertoire. While the potential advantages and dangers of embracing mid-level terms in the practice of behavior analysis (Dixon et al., 2020; Tarbox et al., 2020) and the role mid-level terms play in a reticulated scientific development strategy (Hayes, Barnes-Holmes, & Wilson, 2012) are important questions for behavior analysts to consider, they fall beyond the scope of the current review. Instead, this review will focus on expanding a behavioral account of acceptance by exploring connections and divergences with more precise behavioral principles.

Many of the early conceptual developments within ACT occurred in behavioral analytic journals with authors providing connections to technical, conceptually systematic, and behavioral accounts of core ACT processes (Friman et al., 1998; Hayes & Wilson, 1994). More recently, several authors have provided behavioral conceptualizations of acceptance that are relevant to this current review. Blackledge and Drake defined acceptance as, “an approach response and/or the absence of an escape response in respect to aversive stimulation -unconditioned, conditioned, or derived” (2013, p. 242). This definition provides a conceptualization of experiential avoidance as behavior under aversive control, and primarily considers acceptance as the absence of such control. Little et al. (2020) provide a similar account, defining acceptance as, “prompting and reinforcing multiple exemplars of exposure to aversive stimuli without engaging in escape behaviors” (p. 11). Central to this definition is the importance of prompting, multiple exemplar training, and reinforcement, which provides behavioral guidance to behavior analysts as to how to structure their implementation of acceptance interventions. Little et al. go on to consider the

functional impact of acceptance interventions, noting that “a previously aversive private event that may lead to avoidance or escape behavior may now be an occasion to access positive reinforcement by engaging in a values-directed behavior” (p. 11). These accounts highlight the core role the Relational Frame Theory (RFT) principle of transformation of stimulus functions plays in conceptual accounts of both experiential avoidance and acceptance.

RFT (Hayes et al., 2001) is a behavior-analytic account of human language and cognition that provides a conceptually systematic technical account of private events (see Hughes & Barnes-Holmes, 2016 for a contemporary basic account and Belisle et al., 2020 for recent review of RFT interventions in ABA). Through mutual and combinatorial entailment, RFT explains how verbally competent humans can derive relationships between stimuli in the absence of direct contingencies. In addition, the RFT principle of transformation of stimulus functions accounts for how derived relations can transform the appetitive and aversive properties of verbal stimuli. As an example, consider a socially anxious child in middle school who was recently invited to their first sleepover party. The child might derive a frame of comparison between the anxious thoughts, feelings, and sensations they routinely experience during lunch-time in the cafeteria with what they imagine they would experience at the sleepover. In doing so, they might derive a “greater than” relationship between the cafeteria and the sleepover, and consequently the stimulus properties of the sleepover could be transformed to elicit more anxious discomfort than the child experiences at lunchtime, despite the child having no direct learning history with sleepovers (see Dougher et al., 2007 for a basic experimental demonstration). When their parents tell them to get ready for the sleepover the child might experience aversive bodily sensations (e.g., muscle tension, trembling, queasiness), emotions (e.g., anxiety and fear), and thoughts (e.g., worries of being made fun of, not being able to leave if things go bad, etc.) and then tell their parents that they are sick and can’t go in an effort to escape these private events (i.e., experiential avoidance).

Through an RFT lens, acceptance can be conceptualized as a mediating behavior that transforms stimulus functions of aversive private events with the goal of reducing escape and avoidance behaviors and increasing approach behaviors. It is important to note that while the goal of acceptance is to reduce

avoidance and escape behaviors, this is not accomplished by removing or mitigating the aversive private events directly. In this regard, acceptance is distinct from traditional behavioral exposure interventions, whose primary aim is to reduce unwanted private events (typically anxiety) via counterconditioning (i.e., systematic desensitization; Davison, 1968) or habituation/extinction procedures (Foa & Kozak, 1986). Such approaches are largely incompatible with acceptance, as engaging in approach behaviors (e.g., exposure) with the goal of reducing or eliminating unwanted private events is functionally avoidant behavior. Instead, acceptance aims both to expand the stimulus functions of private events (to include a broader range of neutral and appetitive functions) as well as to increase behavioral variability in the presence of such private events. Of note, this conceptualization of acceptance overlaps considerably with Craske et al.'s (2014) contemporary inhibitory learning model of exposure, although a full exploration of the areas of convergence and distinction are beyond the scope of the current review.

Applied to the example above, an acceptance intervention could involve asking the child to write down all of the unwanted aversive private events they are experiencing on post-it notes. The behavior analyst could go slowly post-it by post-it, asking the child to simply notice and describe each private event in detail. In doing so, the child would have the opportunity to expand their behavioral repertoire in the presence of the aversive private events while also expanding the stimulus functions of each private event. For example, the child might describe that the intensity of the muscle tension changes over time like waves in an ocean and that the tension is typically most intense in their chest. While this new behavior (describing the tension) and neutral functions (e.g. "like waves in an ocean," "mostly in my chest") may seem inconsequential, it is important to note that the child likely has a well-established history of engaging in immediate escape behavior any time muscle tension is present (cf. Mowrer's Two Factor theory; McAllister, & McAllister, 1995). Thus, acceptance as simply willingness to "sit with" an unwanted private event can be conceptualized as a differential reinforcement procedure where avoidance/escape responses are placed on extinction and behavioral variability is reinforced.. Behavioral variability is an operant (Neuringer, 2002), and acceptance as a mediating behavior can occasion increased variability in the presence of aversive private events. Beyond noticing, prompts to physicalize

the private event (e.g., “if your tension was sitting in front of you what shape would it be?”) or to interact with it abstractly (e.g., “what type of music do you think this tension would be in to?”) can also occasion behavioral variability in response to the aversive private event. Such variability is of applied significance as it allows for novel approach behaviors to be selected by their consequences (Skinner, 1981). This increased flexibility with regard to both stimulus functions (i.e., aversive private events as more than just “bad”) and behavioral variability (engaging in behaviors other than avoidance/escape in the presence of private events), along with extinction of avoidance/escape repertoires in the presence of private events are core behavioral processes that likely underlie acceptance.

A behavior analyst could further strengthen acceptance interventions by directly prompting transformation of appetitive functions to private events with a history of aversive functions. For example, by asking the child if they are willing to take their chest tension with them to the sleepover if it means they might make new friends. Such an intervention may lead to the child transforming the properties of the tension to also include a frame of coordination with possible friendships. Additionally, the behavior analyst might ask the child to take the post-it notes with the aversive private events with them to the sleepover in their pocket with the instructions to go to the bathroom midway through the party and read the post-its. The post-it notes could then possibly serve as physical prompts for acceptance behaviors at the sleepover (e.g., noticing discomfort and returning to valued action). While this example focused on just one instance of experiential avoidance and acceptance in the context of a sleepover, through multiple exemplar training, acceptance interventions can strengthen generalized framing of coordination between uncomfortable private events and valued action, such that the stimulus functions of aversive thoughts, feelings, and sensations are expanded to include appetitive functions. For example, the child might derive motivational augments such as “when I’m nervous that means I’m doing something that matters” or “my chest is getting tight again, I better keep doing what I’m doing. (see Gil-Luciano, et al., 2017 and Jackson et al., 2016 for recent empirical demonstrations of motivational augments in the context of other mid-level ACT processes).

Taken as a whole, behavioral conceptualizations of acceptance as involving transformation of stimulus functions of aversive private events and increased behavioral variability in the presence of such events provide a starting point for behavior analysts to approach acceptance. In particular, behavioral analysts can conceptualize acceptance as a verbal mediating behavior designed to reduce problematic escape and avoidance behaviors and increase approach behaviors in the presence of aversive private events. However, additional conceptual and empirical development is needed for further link the mid-level definition of acceptance to precise behavioral processes.

Empirical Support for Acceptance

As a core mid-level process within the psychological flexibility model and a core component of ACT, acceptance enjoys a robust level of empirical support across multiple lines of evidence. This section will provide a brief overview of evidence supporting acceptance from clinical trials, self-report measures, and laboratory/analogue studies. More detailed attention will then be given to outcomes from recent empirical work applying ACT within the scope of practice of ABA.

Outcome Studies

As of June 2020, there have been 375 published randomized controlled trials of Acceptance and Commitment Therapy and over 60 peer-reviewed systematic reviews and meta-analyses of the ACT outcome literature (Association for Contextual Behavioral Science, n.d.; Association for Contextual Behavioral Science, 2020). Overall results from these studies, reviews, and meta-analyses suggest that ACT is more effective than control conditions and at least as effective as established active treatments (e.g., Cognitive Behavior Therapy) across a variety of clinical disorders and behavioral problems. These numbers alone are not sufficient evidence for the effectiveness of acceptance, as not all outcomes are favorable to ACT (though the vast majority are), the degree to which acceptance was emphasized in these studies varies, and acceptance was almost always implemented as part of a treatment package with other psychological flexibility processes. Rather, these top-level numbers are best interpreted as evidence of the mature nature of scientific interest and inquiry into ACT over the past 30 years and as general indicators

of empirical support for the efficacy of the psychological flexibility model in addressing a broad range of clinically relevant behaviors.

There are several recent ACT meta-analyses that are of more targeted interest for behavior analysts. In the parenting domain, Byrne et al.'s (2020) systematic review of 27 studies found support for ACT interventions designed to support parents of children with neurodevelopment disorders along with other chronic health difficulties. These findings are consistent with a previous review conducted by Parmar et al. (2019), which also found support for improving outcomes of parents caring for children with significant medical conditions. Further, a meta-analysis more broadly focused on ACT interventions for family caregivers found support for reductions in depression, anxiety, and stress (Han et al., 2020). While these reviews were not limited to parents of children with autism, they all included ACT interventions specifically focused on this population (e.g., Blackledge & Hayes, 2006; Hahs et al., 2019), providing promising evidence of ACT's efficacy in this area of interest to many behavior analysts.

Other domains of interest to behavior analysts are also well-represented in the ACT literature. While the majority of ACT outcome studies have been focused on adult population, a recent meta-analysis of 14 studies of ACT applied to children found that ACT was more effective than treatment as usual and at least as effective as established treatments (i.e., CBT) for targeting depression, anxiety, and quality of life in children (Fang & Ding, 2020). Meta-analyses and systematic reviews of health behaviors, such smoking cessation (Roche et al., 2019), weight loss (Lawlor et al., 2020; Roche et al., 2019; Rogers et al., 2017), and increased physical activity (Manchón, et al., 2020) also all provide evidence for the effectiveness of ACT interventions. Finally, recent reviews support ACT's effectiveness in reducing burnout among mental health providers (Rudaz et al., 2017) and direct care staff (Reeve et al., 2018).

Self-Report Measures

Indirect measures of behavior such as self-report scales are generally viewed unfavorably in applied behavior analysis (cf. Cooper et al., 2020, p. 52). However, indirect measures are commonly employed in the broader literature, and they do offer a valuable complementary source of support for

acceptance as an important psychological process. The Acceptance and Action Questionnaire-II (AAQ-II; Bond et al., 2011) is one of the most commonly used measures in the ACT literature, as evidenced by over 1,200 citations of the measure validation article. This seven-item scale is generally referred to as a measure of psychological inflexibility, but the original authors of the measure make a strong case that the scale specifically focuses on experiential avoidance, the degree to which a person attempts to control or change unwanted private events (Bond et al., 2011). Since acceptance is the reciprocal process of experiential avoidance (i.e., acceptance involves experiencing unwanted private events without engagement in escape or avoidance behaviors), this scale is an ideal indirect measure of acceptance. A meta-analysis of correlations between the AAQ-II and clinical measures of distress revealed significant positive relationships with both depression ($r = .55$) and anxiety ($r = .52$), suggesting that attempts to control unwanted thoughts and emotions are associated with increased distress (Ruiz, 2010). More contemporary measures, such as the brief experiential avoidance questionnaire (Gámez et al., 2014; Tyndall et al., 2019) and the acceptance and experiential avoidance subscales of the Multidimensional Psychological Flexibility Inventory (MPFI; Rolffs et al., 2016) also have displayed theoretically consistent relationships with various measures of distress and quality of life, lending further support for acceptance as a central process related to psychological health (Kashdan & Rottenberg, 2010).

Even stronger evidence for self-report measures of acceptance can be found in the mechanisms of change literature, which uses statistical mediation techniques to explain therapy outcomes via changes in process measures (e.g., acceptance). As an example, Bricker et al. (2013) compared a web-based ACT intervention for smoking cessation to an active treatment (i.e., Smokefree.gov) and found that participants randomized to the ACT condition had over double the quit rate (23%) at 3-month follow up compared to the active control (10% quit rate). Mediation analyses using the Avoidance and Inflexibility Scale (Gifford et al., 2004) as a measure of acceptance revealed that 80% of the treatment effect (i.e., quit rate) was explained by changes in acceptance of cognitions, emotions, and physical sensations during treatment (Bricker et al., 2013). This finding is notable, as it provides evidence that treatment related changes in acceptance were associated with improved behavioral health outcomes. A recent meta-analysis of

mediational studies in ACT further increases confidence in the central role of acceptance within the psychological flexibility model, as it was the only process reviewed that demonstrated consistent mediational effects across mental health, quality of life, and behavioral outcomes (Stockton et al., 2019). These mediational findings suggest that acceptance is one of the primary active mechanisms by which successful ACT interventions generate clinically meaningful behavior change. Thus, from a behavior analytic perspective continuous assessment of client willingness to experience distressing private events should be a central feature of ACT based behavior change programs.

Behavioral Measures and Component Analyses

Another promising line of evidence for acceptance can be found in laboratory studies that aim to demonstrate analogues of acceptance using direct measures of behavior. An early and seminal work in this domain used a cold pressor task to evaluate the effects of acceptance-based, control-based, and attention placebo approaches towards private events related to pain (Hayes et al., 1999). Participants initial pain tolerance was measured via the cold pressor task, with the duration of time that their hands were submerged in the 1°C water used as the dimension of acceptance behavior. The acceptance-based rationale intervention consisted of a 90-minute scripted series of rationales and exercises designed to teach participants to notice their reactions to uncomfortable thoughts, feelings, and sensations without acting on them. In contrast, the 90-minute control-based rationale taught a stress inoculation approach to modify pain while the 90-minute attention placebo condition provided educational presentations regarding various aspects of pain. Participants in the acceptance rationale condition subsequently submerged their hand for longer in the post-intervention cold pressor task relative to participants in the control rationale and placebo conditions. This finding was one of the first to provide direct behavioral evidence of acceptance as an effective behavior change process.

Subsequent work has replicated and extended cold pressor task findings supporting the efficacy of acceptance (Forsyth & Hayes, 2014; Wang et al., 2019). In addition, several researchers have demonstrated that self-report measures of acceptance positively correlate with longer duration of submersion during the task, lending increased validity to the self-report literature reviewed above

(Feldner et al., 2006; Zettle et al., 2005). Beyond the cold pressor task, studies have demonstrated the effectiveness of acceptance analogue interventions across a diverse range of behavioral outcomes, including physiological measures of emotional responding (Campbell-Sills et al., 2006), panic symptoms during a CO₂ inhalation challenge (Eifert & Heffner, 2003), and physiological arousal during a public speaking task (Hofmann et al., 2009; see Levin et al., 2012 for a detailed review and meta-analysis). These analogue interventions are of specific interest to behavior analysts as they all involve direct and overt measures of behavior change, in contrast to self-report measures that typically dominate the clinical literature.

Evidence for Acceptance within ACT in ABA

While a systematic review of all Acceptance and Commitment Therapy research within ABA is beyond the scope of this paper, an attempt was made to sample representative research articles for review. Three journals were selected for search based on the author's knowledge of their contents and reputation in the field: *Behavior Analysis in Practice*, the *Journal of Applied Behavior Analysis*, and the *Journal of Contextual Behavioral Science*. A search for "acceptance and commitment" in *Behavior Analysis in Practice* yielded 27 results, with 8 research articles screened for review. Two articles that reported treatment outcomes and included a specific reference to an acceptance treatment component or process in the methods were reviewed (Enoch & Dixon, 2019; Pingo et al., 2020). A search for "acceptance and commitment" in the *Journal of Applied Behavior Analysis* yielded 10 results, with two research articles screened for review. One article that reported treatment outcomes and included a specific reference to an acceptance treatment component or process in the methods was reviewed (Twohig et al., 2007). Finally, a search of "behavior analysis" and research article in the *Journal of Contextual Behavioral Science* yielded 46 articles, with 11 articles screened for review. Five articles that reported treatment outcomes and included a specific reference to an acceptance treatment component or process in the methods were reviewed (Brazeau et al., 2017; Gould et al., 2018; Hahs et al., 2019; Szabo, 2019; Wang et al., 2020).

An overview of the eight studies, including populations, target behaviors, research designs, outcomes, and acceptance treatments components, is presented in Table 1. All studies reviewed found

support for the effectiveness of ACT interventions that included acceptance components in ABA. Notably, there was considerable diversity in both populations and target behaviors, which provides promising preliminary support for the broad applicability of ACT within ABA. Further, there was considerable variability in the length of ACT intervention, from as brief as 1.5 to 4 hours (Brazeau et al., 2017; Hahs et al., 2019; Szabo, 2019) to as extensive as a 30-hour week long “camp” (Enoch & Dixon, 2019). This suggests that the dose of ACT needed to obtain socially meaningful outcomes may vary by context. The majority of studies (62.5%) implemented ACT alone, while others combined ACT with behavioral skills training (Brazeau et al., 2017), performance feedback (Pingo et al., 2020), or other behavior change procedures (e.g., DRA+EXT; Szabo, 2019). With regard to methodology, the majority of the studies reviewed used variants of multiple baseline designs and direct measures of behavior (75%). The predominant use of high-quality behavior analytic methodology in these studies strengthens the literature base of ACT within ABA, and also lends support for the inclusion of ACT interventions within the mainstream scope of ABA practice (Tarbox et al., 2020).

The content and emphasis of acceptance interventions varied considerably across studies. Most notably, acceptance was given significant emphasis in only half of the studies (Hahs et al., 2019; Pingo et al., 2020; Szabo, 2019; and Twohig et al., 2007). This pattern could reflect that behavior analysts place greater importance on other ACT processes, such as values and committed action components, which have received previous attention in the field and may be more amenable to mainstream ABA applications (Plumb et al., 2009). However, some studies placed a significant emphasis on mindfulness processes (e.g., Enoch & Dixon, 2019) without explicitly referencing these activities as targeting acceptance. It could be the case that acceptance is more prominent in ACT ABA interventions than revealed in this review. For example, several studies were excluded from this review for not explicitly referencing acceptance in the methods, yet they contained mindfulness and other ACT interventions that appear to target acceptance as an active treatment mechanism (e.g., Chancey et al., 2019; Little et al., 2020). Given the flexible and interdependent nature of mid-level hexaflex terms (Hayes, Strosahl, & Wilson, 2012), it is likely that the limited treatment attention found for acceptance is an artifact of the inclusion criteria used for this review

and not a reflection of lack of interest in acceptance as a treatment process. Future reviews of the literature should employ broader inclusions criteria (e.g., specific reference to acceptance or presence of acceptance processes as coded by independent raters) to better capture the scope of acceptance within the ACT in ABA literature.

With regard to content of acceptance interventions, all the studies used experiential exercises or metaphors to target acceptance, with some also assigning homework or using worksheets to guide participant interactions with the treatment. This is consistent with how ACT has been implemented in the broader clinical psychology and contextual behavior science literatures (Hayes, Strosahl, & Wilson, 2012), and suggests that behavior analysts are implementing acceptance interventions in a manner similar to other practitioners. On the face this finding appears reassuring; however, as a reviewer of this manuscript astutely noted, this raises the question of whether behavior analysts should approach ACT in the same way as practitioners in other disciplines. Functional analysis and individualized treatments are hallmark features of applied behavior analysis, yet half of the studies reviewed used a fixed protocol for all participants (Enoch & Dixon, 2019; Hahs et al., 2019; Pingo et al., 2020; Wang et al., 2020). One study used a fixed protocol but added additional exercises for a participant who did not respond to the fixed treatment (Brazeau et al., 2017), while three studies specifically described individualizing or tailoring content for each participant (Gould et al., 2018; Szabo, 2019; Twohig et al., 2007). Only one study (Szabo, 2019; primary functional analysis reported in Figure 1) reported a functional analysis of verbal behavior prior to the ACT intervention, measuring rates of inflexible behavior as a function of programmed contingencies (i.e., attention, alone, demand, and play). The functional analysis identified escape as the primary function for all three study participants, providing an indication that acceptance intervention strategies were likely appropriate for those participants to address the specific problem behavior of escaped-maintained inflexible behavior in the context of rule changes to an educational game.

The general reliance on scripted protocols and lack of functional assessment across most of the studies reviewed suggest that these are areas of growth for future research. With regard to scripted protocols, one possible explanation for their popularity in the current literature is that they provide strong

technological descriptions that can be easily replicated. Training, implementing, and disseminating ACT in an individualized and functional manner is significantly more challenging than relying on a topographical script; however, doing so may align ACT closer to the core dimensions of ABA by allowing individually tailored functional ACT interventions that are conceptually systematic and effective. Further development and refinement of functional assessment tools for ACT in ABA is also needed. Traditional experimental functional analysis methodology can be modified to identify the possible functions of clinically relevant verbal behavior, and functional assessment techniques such as self-report measures, laboratory measures, and descriptive analysis can be developed to assess specific behavioral principles that underlie acceptance (e.g., transformation of stimulus functions, behavioral variability, etc.).

The nascent empirical literature of ACT in ABA provides promising preliminary evidence of socially meaningful behavior change as a result of ACT interventions that include acceptance. More studies are needed to replicate and extend these findings, and increased attention to methodological rigor, especially with regard to functional analysis and individualized interventions is needed as this literature matures. As a whole, this growing literature provides a promising demonstration that acceptance has potential utility as a treatment technique for behavior analysts to apply across several populations and target behaviors.

Acceptance in Action

To illustrate potential application of acceptance within the scope of practice of ABA a hypothetical case will briefly be presented and then discussed.

Sally is a 41-year-old mother of three. Her youngest son Jake (age 5) was diagnosed with autism spectrum disorder last year and he has been receiving 35 hours a week of EIBI for the past six months. Jake has limited augmented communication (i.e., some PECS use and sign language) and no verbal communication. His problem behaviors include frequent tantrums, physical aggression towards parents and sibling, inappropriate toileting, and elopement. You are tasked with providing home behavior programming for the mother to implement in the evening and on weekends. You have noticed that Jake's

problem behaviors have recently increased at home and you suspect that Sally may not be adhering to your program. In particular, she frequently cancels sessions, fudges data, takes vacation days where she doesn't follow the program, and argues with you when you bring up her non-adherence. You have also observed her breaking down and crying and stating that "I'm a failure as a mom" when attempting to implement the behavior plan.

Applying Acceptance as a Technique

Sally is likely experiencing intense aversive private events based on the collateral responses observed by the behavior analyst (e.g., breaking down, stating that she is a failure). Based only on this limited topographical information it is reasonable to consider acceptance-based techniques that are supported in the behavior analytic literature. However, before proceeding it is essential for behavior analysts to refrain from making causal assumptions based only on the topography of private events. Thoughts, emotions, and bodily sensations are not causes of behavior; rather, they are instances of behavior to be explained (see Hayes & Brownstein, 1986 for a discussion of behavior-behavior relations). Further, functions of behavior, including private events, cannot be inferred solely from topography, and must be considered in the broader context of the client's interactions with the environment. For example, Sally could report the thought "I'm a failure as a mom" while successfully implementing the behavior plan. In this instance, there would be no need for an acceptance intervention despite the presence of a private event whose topography suggests aversive functions. Conversely, Sally could report "I can accept that this will be difficult and make room for my pain" while drinking a bottle of wine and ignoring Jake. Topographically, this statement appears to be an indication of acceptance, though a cursory assessment of the broader context suggests the clear presence of problematic avoidance/escape behaviors.

A reviewer of this manuscript noted that implementing acceptance as a topographical technique without consideration of context could result in an ineffective intervention and possible client harm. I agree, as a behavior analyst might implement acceptance interventions in a manner that reinforces avoidance of private events or encourages inflexible rule-governed behavior. For example, Sally might derive a frame of coordination between acceptance and tolerating, functionally engaging in acceptance so

that the “bad” thoughts will go away eventually. Further, a narrow and rigid focus on acceptance might result in the behavior analyst missing contexts where more direct behavior change strategies are available (e.g., prompting Sally to “accept” being overwhelmed by the behavior plan instead of simplifying the plan). It is also important to note that experiential avoidance is not always problematic, and may be adaptive in some contexts (e.g., Sally distracting herself by going for a walk when she experiences intense frustration and urges to give up followed by returning and implementing the plan). Thus, acceptance interventions delivered without consideration of context can potentially decrease the response probability of effective behavioral repertoires. Behavior analysts may also use acceptance techniques in ways that are overly dogmatic and focused on changing the topography of the client’s verbal behavior instead of addressing the client’s functional behavioral repertoire. For example, a behavior analyst could narrowly reinforce a client’s “correct” acceptance responses (i.e., verbal responses that topographically correspond to scripted acceptance exercises) while ignoring or even punishing “incorrect” response topographies that might be functional in the client’s context.

Despite these possible dangers, technique-based acceptance approaches are currently dominant in the ACT in ABA literature, and behavior analysts may find contexts where their use is ethical and appropriate. While a detailed discussion of the ethical, scope of practice, and boundary of competence concerns for such use is beyond the scope of the review, behavior analysts might consider using acceptance techniques for low-intensity and low-risk problem behaviors in populations and contexts where they have established competence. Behavior analysts can further mitigate risks of technique-based interventions by gaining clear informed consent (including a discussion of the possible risk of iatrogenic effects) and by engaging in continuous assessment of both the problem behavior as well as possible problematic repertoires that might emerge. In addition, they can mitigate risks by limiting the scope and intensity of the intervention to be as narrow as possible and by identifying possible referral sources and preparing the client/stakeholder for a referral should it be needed during treatment.

Returning to the example of Sally, technique-based acceptance interventions tailored to non-adherence with the behavior plan could include several components. Formal mindfulness exercises could

allow her to notice her private events in a non-judgmental manner while acceptance exercises such as “joe the bum” (Hayes, Strosahl, & Wilson, 2012; p. 279) and “clean and dirty pain” (p. 283) could help encourage Sally to contact her private events without engaging in escape behaviors. Looking only at the ACT ABA literature reviewed above (see Table 1) one could choose from no less than 20 specific exercises and metaphors that have empirical support (contact the study authors or refer to Dixon, 2014; Harris, 2008; Harris, 2009; Stoddard & Afari, 2014; Walser & Westrup, 2007; & Zettle, 2007 for full text of the metaphors/exercises).

The potential impact of these exercises could be strengthened by debriefing them with Sally. For example, Szabo (2019) used three questions to debrief ACT treatment exercises and metaphors: “What happened? So what? And now what?” (p. 182). While these questions were designed for children they could easily be adapted to work with parents. Questions such as “what happened?” or “what is showing up for you?” could encourage Sally to describe the private events she experienced during the exercise, which could then inform future intervention targets or technique selection. Questions such as “so what?” or “what, if anything, about that experience connected with you?” could provide an opportunity to discuss potential applications of the exercise to Sally’s current context. Questions such as “now what?” or “what do you want to with this?” could occasion Sally to make specific behavioral commitments to apply the technique to her own life, and could be used to assign homework or set up additional exercises during treatment.

Applying Acceptance as a Functional Process

Moving beyond application of specific acceptance techniques, it is also possible to target acceptance processes in a more functional manner using ACT. While not as common as the technique-based approaches to ACT that are currently dominant in ABA literature, clinical behavior analysis has deep roots within the behavior analytic tradition (Dougher, 2000; Kohlenberg et al., 1993). Clinical behavior analysis focuses on intervening on behavior functionally during therapy/training and does not rely on scripts or pre-planned exercises/metaphors. The ACT Matrix (Polk & Schoendorff, 2014) is an ACT tool that is often used as a structured intervention with clients (e.g., Gould et al., 2018 used the

matrix in their intervention). However, it can also be used as a case conceptualization tool for behavior analysts to identify possible functional relationships between private events and overt escape behaviors (i.e., experiential avoidance). While not as rigorous as an experimental functional analysis of experiential avoidance or other ACT processes, it can provide a useful tool for approaching acceptance in a more functional manner.

A modified ACT Matrix of Sally's non-adherence is presented in Figure 1. The matrix tool requires the behavior analyst to make behavioral discriminations along two dimensions. The vertical dimension involves a discrimination between overt and covert behavior, with overt behavior defined as behavior that is publicly observable and covert behavior defined as behavior that is in-principle observable to an $n = 1$ (i.e., private events). The horizontal dimension involves a discrimination between behavior that moves the clients towards or away from their values (another core ACT process). On the top half (i.e., overt behavior), this discrimination can be thought of as delineating between behavior under appetitive control (towards) or aversive control (away). On the bottom half (i.e., covert behavior), this discrimination involves categorizing private events as involving unwanted, thoughts and emotions (away) or verbally-constructed desired consequences of behavior (towards). The four quadrants of the matrix classify behavior as committed action (overt-towards; top-right), values (covert-towards; bottom-right), unwanted private events (covert-away; bottom-left), and experiential avoidance (overt-away; top-left; see Polk & Schoendorff, 2014 for a more detailed account of the Matrix).

Applying the modified ACT Matrix to Sally's case allows for a more functional application of acceptance to address her non-adherent behaviors. The left side of the modified ACT Matrix can orient the behavior analyst to possible functional relationships between unwanted private events (covert-away; bottom-left) and experiential avoidance (overt-away; top-left). For example, if you observe Sally giving-in to Jake's tantrums (e.g., giving him an iPad), you could consider possible private events that Sally might be attempting to escape (e.g., feeling helpless, intense feelings of love for Jake and pain, "wanting a normal kid"). Possible acceptance interventions could then be used to explore if the away behavior is under aversive control. For example, pausing and asking Sally what is showing for up her, stating that

you feel overwhelmed just watching, stating that it must be hard for her to watch him get that upset, or suggesting a body scan meditation to notice any tension in her body would all be ways to prompt and then reinforce acceptance in that moment.

As another example, consider Sally's behavior of "fudging" data. There are many ways a behavior analyst might respond to this problem behavior, including reprimanding Sally for unethical conduct, insisting on more RBT time in the home to increase data integrity, or discussing termination of Jake's intervention due to non-adherence/non-improvement. While these responses all address the topography of non-adherence, they also ignore the possible function of fudging data as an instance of experiential avoidance. For example, it could be the case that thoughts (e.g., "I'm being judged by others, these strangers think they know best, I'm a failure") along with feelings (e.g., helplessness and anger) reliably precede Sally's non-adherence behavior. Acceptance work here could involve probing for possible unwanted private events and modeling approach instead of escape responses. For example, the behavior analysts could ask Sally if she is willing to feel like a failure while accurately recording Jake's tantrums, if it would mean that her and Jake will get the help he needs to succeed. Alternatively, the behavior analyst could use the opportunity to have an open conversation about the deteriorating nature of their working relationship and model acceptance while doing so (e.g., "I'm noticing that I'm feeling disconnected working with you. And, while it is difficult for me to share this, I'm feeling scared and worried that I won't be able to help you and Jake. I'm wondering if you are feeling the same way. Maybe we could just take a minute and notice the difficult stuff that is showing up for us right now.>").

With this functional approach, continuous assessment and functional assessment are essential, as the goal is to prompt, model, and reinforce acceptance within close spatial and temporal proximity to possible instances of experiential avoidance. The behavior analyst is continuously asked to consider possible functions of client/stakeholder behavior and look for indicators of aversive control (e.g., rigidity, "emotional responding," non-adherence, and other escape/avoidance behaviors). This approach is not incompatible with the technique-based method discussed above, as the behavior analyst can both

implement a planned protocol of acceptance interventions and look for and intervene on possible instances of experiential avoidance when they occur.

Acceptance in the Context of Other ACT Processes

The functional approach to ACT can also be used with other psychological flexibility processes, which will be briefly considered in the context of their relationship with acceptance.

Present Moment. Present moment work in ACT involves reinforcing a client's direct contact with environmental contingencies (Hayes, Strosahl, & Wilson, 2012). Even simple breath awareness exercises involve acceptance, as prompting Sally to notice her breath occasions an opportunity for her to contact the environment without engaging in judgement and evaluations (Kabat-Zinn, 2013). Teaching Sally to slow down and notice both her sensory experiences and private events would likely create a context for more focused acceptance work to occur. In particular, present moment processes can enhance opportunities for Sally to contact unwanted private events (e.g., "I'm a failure, he needs to be normal"), as present moment interventions can increase the salience of distressing thoughts, feelings, and sensations.

Defusion and Selfing. Both defusion and selfing interventions share a similar goal as acceptance, in that they both involve broadening repertoires in response to private events. While acceptance focuses on moving the client's overt behavior from aversive to appetitive control in the presence of unwanted private events, defusion and selfing primarily involve broadening a client's verbal behavior repertoire. That is, defusion skills typically focus on prompting and reinforcing more flexible ways of verbally relating to private events (e.g., Sally stating that she is having the thought that she is a failure instead of she is a failure). Defusion work also places a particular emphasis on identifying ineffective verbal rules (e.g., "If Jake has a bad day that means I'm a failure as a mom.") and encouraging contact with direct environmental contingencies that can lessen the functional impact of ineffective rules (e.g., having a bad day and engaging in values-consistent parenting behaviors). In this regard, defusion techniques are complementary to acceptance, as more flexible repertoires in response to a private event (e.g., experiencing "normal" as just some sounds) occasions an increased opportunity for appetitive control (e.g., implementing the behavior plan) even when potentially aversive private events are present (e.g.,

“normal kids don’t need a BIP”). Likewise, acceptance work (e.g., Sally experiencing the thought “I’m a failure as mom” while engaging in escape behavior) may enhance the effectiveness of defusion techniques (e.g., “failure, failure, failure, etc.”), as the absence of aversive control can occasion increased behavioral flexibility and contact with new contingencies (e.g., experiencing “failure” as just some sounds).

Selfing processes, which often involve increased flexibility with regard to perspective taking, are also complimentary to acceptance. Relating to oneself as bigger than just one role or problem (e.g., Sally identifying as Jake’s caregiver, and also as someone who values harmony, creativity, and quality family time) can occasion increased behavioral variability in the presence of unwanted private events related to a specific domain (e.g. moving from “I’m the only one who can care for Jake” to planning for occasional respite care). Further, flexible perspective taking can help clients verbally relate to themselves as distinct from their private events (e.g., Sally noticing that she is noticing that she is having the thought that she is a failure), which may occasion a context where mediating acceptance behaviors of self-related private events are higher probability responses.

Values and Committed Action

Freedom from aversive control is at the heart of ACT conceptualizations of values, highlighting the importance of attending to acceptance when doing values work (Hayes, Strosahl, & Wilson, 2012; Wilson & DuFrene, 2009). When working with clients and stakeholders in clinical contexts it is not unusual to get experiential avoidance responses instead of values when asking about initial treatment goals (e.g., Sally might answer that she wants to “work on feeling more in control” or “get Jake ready for discharge as soon as possible”). Acceptance can also help clients contact the appetitive properties of values (covert-towards; bottom-right in Figure 1) by reducing engagement in experiential avoidance in contexts where valued actions can be reinforced. For example, Sally contacting “wanting the best for Jake” may allow for motivational augmenting and transformation of stimulus functions to momentarily increase the reinforcing properties of implementing the behavior plan with fidelity. However, this is only likely to occur if she is also willing to experience unwanted private events that might also be present (e.g.,

feeling like a failure, hopelessness) without engaging in escape behavior (overt-away; top-left in Figure 1).

Committed action work also involves acceptance, as engaging in consistent patterns of valued behavior involves doing so even when unwanted private events are present. When working with Sally on committed action behaviors (overt-towards; top-right in Figure 1), the behavior analyst can look for opportunities to frequently reinforce Sally's willingness to engage in valued action even when unwanted private events are present (e.g., you felt burnt out over the weekend and you still used the behavior plan and collected data!). Further, failures of committed action (e.g., Sally taking a day long "vacation" from the BIP) can be explored through an acceptance lens. Often times unwanted private events related to committed action failures can occasion more experiential avoidance (e.g., "I can't stick with the plan so I should just end treatment"); thus, acceptance processes are particularly indicated when lapses or setbacks occur in treatment.

Conclusion

Acceptance is an integral component of ACT in ABA, and it enjoys considerable empirical support from the broader contextual behavioral science and clinical psychology literatures. While mainstream applications of acceptance within ABA are still emerging, a select review of the literature reveals promising empirical support for use of acceptance across a broad range of populations and target behaviors in ABA. Behavior analysts interested in acceptance can choose from a variety of empirically validated protocols, exercises, and metaphors to implement; however, caution must be taken to remain within the emerging scope of practice of ACT in ABA and their own personal boundary of competence. In addition, behavior analysts might also consider adopting some of the functional applications of acceptance proposed in this review.

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Table 1*Overview of Select ACT studies in ABA that Reported Acceptance Treatment Components*

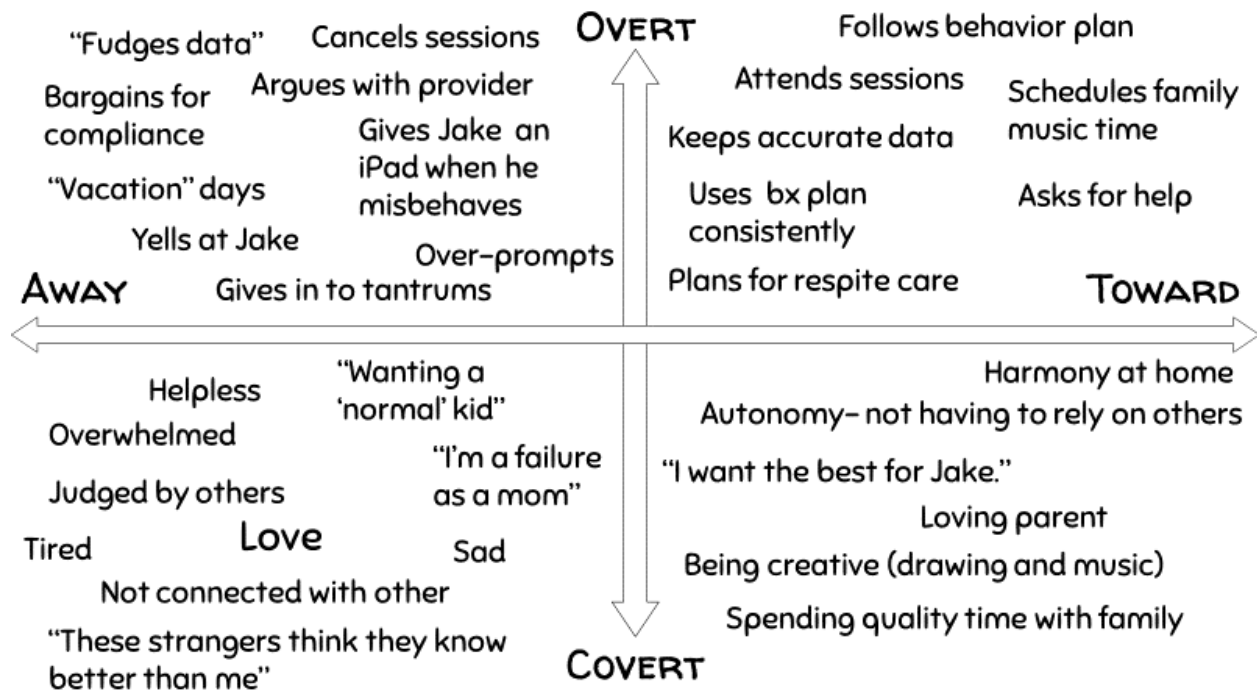
Authors	Population	Problem (Target Behavior)	Design	Outcomes	Acceptance Interventions
Brazeau, Rehfeldt, Mazo, Smalley, Krus, & Henson, 2017	3 individuals with developmental disabilities	Job interview anxiety (% of interview steps completed)	MBD across participants	2 of 3 participants showed significant improvements	Acceptance was targeted in 3 mindfulness exercises; mindful walking (Stoddard & Afari, 2014), mindful breathing (Zettle, 2007), and mindful body scan exercises (Walser & Westrup, 2007). Each session was ~15 minutes with participants experiencing 5-10 sessions.
Enoch & Dixon, 2019	30 typically developing children (ages 7-12)	Non-clinical intervention (self-reports of mindful awareness and psychological flexibility)	Quasi-experimental group design	Increased psychological flexibility and mindful awareness in intervention condition	Acceptance interventions included "Racing to Values" (Dixon, 2014; Day 42) and as Seen on TV (Dixon, 2014; Day 74). Total ACT, mindfulness, and yoga intervention duration was 30 hours.
Gould, Tarbox, & Coyne, 2018	3 mothers of children with autism	Caregiver stress (frequency of values-directed parenting behaviors)	Non-concurrent MBD across participants	All 3 participants displayed significant increases in valued-directed behavior	Acceptance was the focus of one of the six 90-minute sessions and integrated with other processes in other sessions. Exercises were from Harris, 2009 and Stoddard & Afari, 2014.
Hahs, Dixon, & Paliliunas, 2019	18 parents of children with autism receiving ABA services	Caregiver depression and ACT process measures (8 self-report scales)	RCT	Decreased depression and improvement on 5 of 7 ACT process measures in ACT condition	Acceptance was targeted along with other processes during one of the two 2-hour group sessions. Acceptance exercises included the serenity prayer, bum at the door, challenging person space, your eulogy, and three questions.

Pingo, Dixon, & Paliliunas, 2019	5 direct-service providers at an institutional/residential facility	Workplace stress (% of intervals delivering active treatment, procedural fidelity, and self-reports of job stress)	MBD across participants	Significant increases in workplace performance were observed with a feedback intervention and ACT + feedback	Acceptance was targeted during an 8-hour computerized or in-person training. Acceptance was facilitated via mindfulness of your hands, leaves on a stream, and mindfulness of emotions exercises (Harris, 2008; Harris 2009)
Szabo, 2019	3 boys with autism (ages 8-10)	Restricted and repetitive behaviors (rate of inflexible behavior and mands for rule changes)	Non-concurrent multiple probe design across participants	An initial DRA+EXT was ineffective at reducing inflexible behavior. The ACT intervention resulted in significant reductions in inflexible behavior for all 3 participants.	Functional analysis conducted pre-intervention and mid-intervention to explore escape functions of inflexible behavior. Each participant received a 4-hour ACT intervention that included acceptance components (e.g., holding ice cubes, drawing broccoli on a hamburger).
Twohig, Shoenberger & Hayes, 2007	3 adults with marijuana dependence	Problematic marijuana use (self-reported use and oral swab test)	Non-concurrent MBD across participants	Zero self-report use and negative swab at posttreatment for all 3 participants. 1 of 3 abstinent at 3-month follow up.	Acceptance components were integrated throughout eight-90 minute weekly individual sessions. Acceptance work focused on “accepting” urges to use marijuana and was individualized for each participant.
Wang, Tarbox, Chastain, & Cameron, 2020	Four bilingual, non-obese Chinese college students	Physical activity (average daily steps and number/duration of gym visits per week)	MBD across participants	All participants displayed clinically meaningful increases in physical activity	Acceptance was targeted during the five-training session (~190 minutes of intervention) although it was not the primary focus. Exercises included five senses, ball in pool (Stoddard & Afari, 2014) and passengers on the bus (Hayes et al., 2012).

Note. MBD = Multiple baseline design; RCT = Randomized controlled trial. DRA+EXT = Differential reinforcement of alternative behavior plus extinction.

Figure 1

A Modified ACT Matrix Conceptualization of Parental Non-Adherence with a Behavior Plan (Sally)



Note: This is a modified version of the ACT Matrix case conceptualization tool (Polk & Schoendorff, 2014). The overt-covert dimension discriminates between publicly observable behavior and private events. The away-towards dimension discriminates between aversive and appetitive control. The four quadrants are: committed action (overt-towards), values (covert-towards), unwanted private events (covert-away), and experiential avoidance (overt-away).