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Toward trauma-informed applications of behavior analysis

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Despite a growing acknowledgement of the importance of understanding the impacts of trauma on therapeutic approaches across human service disciplines, discussions of trauma have been relatively infrequent in the behavior analytic literature. In this paper, we delineate some of the barriers to discussing and investigating trauma in applied behavior analysis (ABA) and describe how the core commitments of trauma-informed care could be applied to behavior analysis. We then provide some examples of how trauma-informed care might be incorporated into ABA practice. We conclude by suggesting opportunities to approach trauma as a viable avenue for behavior analytic research and argue that omitting trauma-informed care from ABA could be detrimental not only to the public perception of ABA, but to the effectiveness of our assessment and treatment procedures.
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In our increasingly complicated world, a great many individuals have or will experience traumatic events. The National Center for PTSD (n.d.) estimates that within the general public, 60% of men and 50% of women experience at least one traumatic event in their lifetimes. The likelihood of experiencing trauma is even greater for some groups, including military personnel (Presseau et al., 2019), first-responders (Köhler et al., 2018), and those living in or escaping from areas of violent conflict (Crumlish & O'Rourke, 2010; Frost et al., 2019). For some, these events will have lasting effects on behavioral or psychological health.

Although there is no universal definition of psychological trauma, most sources acknowledge that it involves exposure to an event or series of events that adversely affects functioning and well-being. For example, the Substance Abuse and Mental Health Services Administration (SAMHSA, 2014), a division of the U.S. Department of Health and Human Services, states that "individual trauma results from an event, series of events, or set of circumstances that is experienced by an individual as physically or emotionally harmful

or life threatening, and that has lasting adverse effects on the individual's functioning and mental, physical, social, emotional or spiritual well-being" (p. 7). The American Psychological Association (n.d.) offers a more succinct definition, stating that trauma is "an emotional response to a terrible event like an accident, rape, or natural disaster."

Trauma can occur at any point in the lifespan. However, adverse childhood experiences (ACEs; Felitti et al., 1998) have featured prominently in understanding short- and long-term difficulties associated with trauma (Angelakis et al., 2020; Hughes et al., 2017; Kajeepeta et al., 2015). These events include abuse and neglect, as well as exposure to domestic violence, substance abuse by a primary caregiver, or divorce. Perhaps understandably, these types of experiences are reported frequently by individuals receiving behavioral health services. For example, Darnell et al. (2019) found that 83% of adolescents seeking psychiatric, substance abuse, or medical treatment reported experiencing one or more traumatic events. According to the Centers for Disease Control and Prevention (CDC, 2019), 61% of adults have experienced at least one ACE and 16% have experienced four or more.

Prevalence estimates provide an indication of the proportion of the population who have experienced a potentially traumatic event, but the effects of those events vary widely across individuals. The spectrum of responses to traumatic events ranges from no response to severe behavioral and health consequences, including posttraumatic stress disorder (Yehuda et al., 2015; Yehuda & LeDoux, 2007). Still other responses include resilience as a result of having overcome adverse experiences. Although not all individuals will respond to the same event in the same way, it may be important to note that particular populations—including children and adolescents in foster or residential care and individuals with developmental disabilities—are more likely to experience potentially traumatic events, including physical or sexual abuse, than

comparable groups in the general population (Euser et al., 2014; Hibbard et al., 2007; Mazzone et al., 2018; McDonnell et al., 2019). Therefore, acknowledging the prevalence of potentially traumatic experiences and their subsequent effect on behavior seems a prudent course of action for any discipline in which practice tends to focus on high-risk groups.

Across disciplines, the concept of "trauma-informed care" (TIC) has come to the forefront of practice guideline development and policy-making (Baker et al., 2018; DeCandia et al., 2014; Guarino et al., 2009; Harris & Fallot, 2001; Isobel & Edwards, 2017; Levinson, 2017). In 2018, the CDC collaborated with SAMHSA to develop TIC training for the CDC's Office of Public Health Preparedness and Response (OPHPR) team to assist in dealing with public health emergencies (Wolkin & Everett, 2018). Harris and Fallot (2001), frequently cited as establishing some of the foundational concepts in TIC, argued that being trauma-informed "means to know the history of past and current abuse in the life of the consumer with whom one is working" and "to use that understanding to design service systems that accommodate the vulnerabilities of trauma survivors and allow services to be delivered in a way that will facilitate consumer participation" (p. 4). The concept of consumer participation implies not only that the person is an active, willing participant in the therapeutic or research process, but that their participation is critical to success. These initiatives, along with a broader research agenda, acknowledge the prevalence of traumatic experiences and the need to develop assessment and treatment approaches that are sensitive to the effects of those events. There are a number of high-impact, peer-reviewed journals devoted to publishing research and policy issues related to the topic, as well as identifying moderators of trauma responses and evaluating the effects of trauma-specific treatments (e.g., *Journal of Traumatic Stress*; *Trauma, Violence, and Abuse*; *Psychological Trauma: Theory, Research, Practice, and Policy*).

Despite a growing acknowledgement of the importance of understanding the impacts of trauma on therapeutic approaches across human service disciplines, discussions of trauma have been somewhat less prevalent in the behavior analytic literature. This is not to say that particular aspects of trauma have not been addressed from a behavior analytic perspective (e.g., Friman et al., 1998a; Prather, 2007; Prather & Golden, 2009), or that behavior analysts have not addressed some of the issues encountered by individuals with documented trauma histories (e.g., Clark et al., 2008; Storey et al., 2017) or those who care for them (e.g., Berard & Smith, 2008; Crosland et al., 2008; Tertinger et al., 1984). Clinical behavior analysts have investigated the efficacy of Acceptance and Commitment Therapy (ACT) in reducing trauma-related symptoms (e.g., Batten & Hayes, 2005; Fiorillo et al., 2017; Spidel et al., 2018). Although these publications provide emerging evidence of the applicability of behavior analytic approaches to supporting those who have experienced trauma, the field as a whole has not yet defined what being "trauma informed" means within a behavior analytic context.

In this paper, we delineate some reasons why the concept of trauma might have occupied a somewhat less prominent place in the behavior analytic literature. We outline a framework for a trauma-informed approach to applied behavior analysis and explore some strategies that might prove to be a good fit for this framework. We conclude by suggesting opportunities to approach trauma as a viable avenue for behavior analytic research,[1] and argue that omitting trauma-informed care from applied behavior analysis (ABA) could be detrimental not only to the public perception of ABA, but to the effectiveness of our assessment and treatment procedures.

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[1]Because we discuss implications of trauma-informed care to both practice and research in ABA, we use the term "client" to refer to both a recipient of ABA services and a participant in ABA research.

Barriers to Discussing Trauma in Behavior Analysis

There are at least three reasons why the concept of trauma might have garnered less attention in behavior analysis than in other disciplines. First, behavior analysts may be hesitant to discuss trauma due to conceptual confusion and interpretive difficulty regarding the phenomenon. As with physical trauma, the causes of psychological trauma are extrinsic to the individual. However, the effect of experiencing traumatic events is generally conceptualized as an internal response to an aversive external event (DeCandia et al., 2014). Although the aversive event might have initially functioned as a punisher for a particular class of behavior (e.g., a child being beaten for spilling something), traumatic events can influence subsequent experiences. In most accounts of inaugural traumatic experiences and their longer-term effects, the focus has been on how the person feels (e.g., fearful, helpless, angry) or perceives the experience (e.g., loss of control, erosion of trust, betrayal). Although there may be physiological or behavioral correlates to the experience of trauma (Jiang et al., 2019; Oh et al., 2018), the locus of the primary response and the language used to describe it may place behavior analysts in somewhat uncomfortable territory. We may be able to categorize the traumatic events and their operant and respondent correlates (e.g., avoidance, response suppression, aggression, increased heart rate), but a precise "trauma" response has proven somewhat elusive. Friman et al. (1998a) lamented a similar lack of precision in defining anxiety, later noting that despite the imprecision, "there is a large class of important phenomena occasioning the term that requires explanation" (Friman et al., 1998b, p. 708). We argue that the same is likely true for trauma. Ultimately, the presence or absence of "trauma" is defined by the person's behavior, verbal or otherwise. We argue that a functional definition of trauma, which focuses on the behavioral

correlates rather than the psychological state, may prove useful for both behavior analysts and those in other disciplines.

A second difficulty in incorporating trauma into a behavior analytic account has to do with our conceptualization of causes. As with anxiety, processes such as stimulus equivalence, derived relational responding, and stimulus generalization (Friman et al., 1998a; Friman & Dymond, 2020) may prove useful in explaining the persistence of trauma responses (e.g., emotional outbursts, blunted affect, hypervigilance) months or years after the traumatic event(s). However, interpreting trauma through a behavior analytic lens and applying that interpretation in practice are two different behavioral repertoires, and it is possible that we are better at the former than the latter. Despite acknowledgement of complex learning histories, behavior analytic practice is largely (and understandably) focused on current contingencies. This tendency may be born of pragmatism, as current contingencies are within the reach of observation and manipulation. Focusing on current environmental events also provides safeguards against relying on supposition or nonfalsifiable hypotheses when interpreting behavior or designing treatments. It may also reflect that our most developed behavioral technologies tend to focus on the effects of the environment on a relatively short timescale. Although gathering information regarding an individual's history is considered good, ethical practice within the behavior analytic assessment process (BACB, 2020), the degree to which information regarding one's history (i.e., remote contingencies) affects the conclusions drawn from functional assessment results or informs subsequent treatment planning is less clear. The majority of behavior analytic studies that have evaluated interventions for individuals with documented trauma histories have not described those histories or provided evidence that the trauma history factored into treatment decisions (cf., Batten & Hayes, 2005; Fiorillo et al., 2017). This suggests that behavior analysts might not

routinely ask for details about these events or consider them important in planning the therapeutic process. Given current evidence regarding the ways in which trauma may change physiology and behavior (Teicher et al., 2016), failing to consider that these histories may also affect responses to current environmental events may be a serious omission. For example, a behavior analyst might know that a child experienced severe neglect prior to being placed in foster care. They might also have conducted a functional analysis that confirms that adult attention reinforces aggression. Whether the child's history of neglect is taken into account in planning a treatment, rather than focusing solely on the immediate contingencies, is perhaps what differentiates the practice from being "trauma-informed" or not.

The third potential barrier to incorporating trauma into behavior analytic research and practice has to do with evidence. Although the growing acknowledgement of trauma prevalence has resulted in a proliferation of frameworks for providing TIC and broad agreement about the general commitments (Bendall et al., 2020; Branson et al., 2017), the literature has failed to garner a set of widely accepted, data-informed practices demonstrating improved client outcomes. Maynard et al. (2019), for example, conducted a systematic review of trauma-informed care in schools and failed to produce a single study with a rigorous enough research design to meet the inclusion criteria. Granted, these limitations have been acknowledged both within and outside the TIC community (e.g., Berliner & Kolko, 2016; Birnbaum, 2019; Hanson & Lang, 2016), with evidence of the effectiveness of TIC approaches tending to focus more on changes in staff knowledge and perceived efficacy than on client outcomes (Branson et al., 2017; Champine et al., 2019; Maynard et al., 2019). Taken together, overcoming these three barriers may seem antithetical to a science grounded in empiricism, pragmatism, and precise definitions of principles

and constructs. However, they may also be the very reasons why behavior analysts are well placed to contribute.

A Possible Framework for Incorporating TIC into ABA

Although conceptual barriers may have prevented bridging the gap between the TIC literature and behavior analysis, other disciplines have outlined core commitments and values of a TIC approach, which may serve as a guiding framework for incorporation into ABA and may help cultivate fertile ground for research (Guarino et al., 2009; Hopper et al., 2010; Moses et al., 2003; SAMHSA, 2014). Definitions of TIC vary across entities; however, there appear to be four core commitments germane to the conceptualization and practice of TIC. They are to: (a) acknowledge trauma and its potential impact, (b) ensure safety and trust, (c) promote choice and shared governance, and (d) emphasize skill building. Some of these prescribed practices are readily amenable to behavior analytic integration because they represent existing features of ABA practice (e.g., emphasizing skill building; e.g., Carr & Durand, 1985; Drifke et al., 2020; Ghaemmaghami et al., 2016; Tiger et al., 2008; Van Houten et al., 1988), whereas others may require more careful explication with respect to the manner in which they could apply to ABA research and service delivery. In what follows, we outline a framework for a TIC approach to ABA by (a) defining the core commitments of TIC as we understand them, (b) offering behavior-analytic conceptualizations of these commitments where needed, and (c) describing the implications of each as it relates to the fundamental goals of TIC, which are to acknowledge and address trauma while fostering effective participation in assessments and interventions common to ABA.

An important distinction highlighted in the TIC literature warrants mention before attempting a behavior analytic interpretation. DeCandia et al. (2014) and SAMHSA (2014) provided separate definitions for *trauma-specific service* and *TIC*. Trauma-specific services are individualized clinical interventions designed to directly address trauma-related symptoms. TIC refers more broadly to a universal approach, taken by practitioners and organizations, to appropriately support and avoid retraumatizing clients who may have experienced traumatic events. Whereas the former is considered a specific set of reactive strategies and interventions, the latter is viewed as a generally proactive, preventative approach to mitigating effects associated with trauma for all potential clients receiving care. The science of behavior analysis is likely well placed to contribute to both approaches; however, the current discussion will focus on TIC and its potential integration into behavior analytic research and practice.

Acknowledge Trauma and its Potential Impact

The acknowledgment of trauma and its potential impact is an over-arching mission of TIC. Indeed, Harris and Fallot (2001) described it as the very definition of being "trauma informed." In their trauma-informed organizational toolkit for homeless services, Guarino et al. (2009) argued that understanding trauma involves recognizing that many current behaviors may be ways of adapting to and coping with past traumatic experiences. A behavior analytic interpretation of this notion acknowledges that features of the current environment may exert control over trauma-related responses due to shared stimulus properties between the current environment and those present during the initial traumatic event (Dinsmoor, 1995). For example, individuals with a history of physical abuse may respond differently than individuals with no history of abuse to even mild forms of physical management (e.g., engaging in severe behavior when being physically guided to emit a correct response; McDonnell et al., 2015). Most of the

studies examining risk factors for developing severe responses to trauma (i.e., posttraumatic stress disorder) tend to emphasize individual differences such as preexisting traits as predictor variables (Yehuda et al., 2015; Yehuda & Ledoux, 2007). We acknowledge that the notion—that an individual may respond differently to potentially aversive stimulation depending on their history—is based on multiple factors of which we currently know little, especially from a behavior analytic perspective. Further research examining the environmental and experiential variables that predict different responses to trauma-related stimuli is needed. It would be unwise to assume that all who have experienced traumatic events would respond to those events in the same way; nevertheless, an element of caution and tentativeness may allow behavior analysts to avoid retraumatization by merely acknowledging the *potential* impact of any given traumatic event.

Although there are far-reaching implications of this notion to ABA practice, a potential difficulty in acknowledging trauma is the degree to which the behavior analyst knows that it has occurred. In some cases, clients receiving ABA services may have documented trauma histories, and it is probable that an organization charged with serving such clients would not hesitate to plan accordingly. If a child experienced neglect at home in the form of extended seclusion or isolation, it seems reasonable to assume that well-meaning behavior analysts would consider past trauma and exercise caution in clinical decision making. Such caution would result in perhaps refraining from programming certain procedures until less intrusive procedures have been exhausted, or at least until more information has been gathered regarding the impact of such a procedure on the child. For example, if multiple other intervention strategies have proven unsuccessful at maintaining safety, a practitioner may try an exclusionary timeout procedure while paying particular attention to any negative emotional responding from the child, with a plan to immediately terminate the procedure upon observation of any such behavior. Difficulties to this cautionary approach may emerge if certain procedures are somehow clinically indicated from a pretreatment functional assessment (e.g., escape extinction involving physical guidance as an intervention for behavior determined to be sensitive to escape; Zarcone et al., 1994) or if the severity of behavior seemed to necessitate a more restrictive procedure. However, less intrusive alternatives exist and may serve as temporary strategies while more effective interventions are developed (e.g., noncontingent reinforcement, Carr et al., 2009; differential reinforcement without extinction, Trump et al., 2020). Research identifying the variables that moderate the effect of certain behavioral procedures on individuals with various traumatic histories could lead to clearer guidelines regarding the conditions under which certain procedures should be categorically avoided.

In other cases, however, clients receiving ABA services may have undocumented histories of trauma. The overwhelming majority of practicing behavior analysts (78%) provide services to individuals diagnosed with intellectual and developmental disabilities (Behavior Analyst Certification Board®, 2020; LeBlanc et al., 2012). Given (a) the high prevalence of ACEs among children (Darnell et al., 2019); (b) the differentially greater risk for trauma among individuals with intellectual and developmental disabilities (Hibbard et al., 2007; Kerns et al., 2015); (c) the notion that communication deficits are a core feature of developmental disabilities like autism spectrum disorder (Ahearn & Tiger, 2013); and (d) the fact that most contemporary measures of trauma involve some form of verbal report (e.g., Cocozza et al., 2005; Morrissey et al., 2005), it is both possible and probable that there are clients who arrive at the doorstep of ABA services with a history of trauma that will remain unknown to the service provider.

Whether life threatening or not, some life events may have lasting traumatic impact, such as the death of a family member, parental marital strife, or moving away from a community, among many others. Clients may also routinely experience potentially traumatizing events during the course of ABA treatment. Some examples include transitioning to a residential facility away from home, staff and peer turnover in service settings, or being repeatedly physically restrained or secluded during episodes of dangerous behavior. Behavior analysts may not currently have methods to ascertain pervasive behavioral impacts of such events, but they all may constitute traumatic experiences. The mere possibility of such cases suggests that behavior analysts may benefit from assuming a universal approach with respect to acknowledging trauma and its impact. In other words, in the absence of concrete knowledge, it may be best to assume that any client walking through the door to ABA services could have a history of trauma, and to behave accordingly by exercising caution with respect to clinical decision making and vigilance with respect to observing avoidance or negative emotional behavior. In the same way that philosophic doubt is a "guiding conscience underlying science" (Cooper et al., 2019, p. 27), the acknowledgment of trauma, confirmed or otherwise, may provide behavior analysts a guiding conscience to underlie both practice and research.

Ensure Safety and Trust

TIC prioritizes establishing a safe physical and emotional environment where a client's needs are met and provider responses are consistent and respectful (Guarino et al., 2009). In accordance with this core TIC commitment, it is not enough that a client feels safe in the space in which they are receiving services, but they should trust that those working with them will maintain safe therapeutic practices throughout their experience.

Safety may be straightforward to define from a behavioral perspective; it suggests that one is

free of impending harm while behaving in a context with minimal aversive stimulation, as indicated by no or minimal engagement in avoidance or escape of that context. Indeed, Dinsmoor (2001) noted that features of the environment that signal predictable periods devoid of aversive stimulation can be operantly conditioned as *safety signals*. By contrast, environments in which individuals routinely experience unpredictable threats (i.e., uncertainty) can produce contextual anxiety, a risk that appears to be heightened in individuals diagnosed with autism spectrum disorder (Baas, 2013; Chamberlain et al., 2013). Safety may be best defined as behaving in an environment replete with safety signals.

Operationally defining *trust* requires interpreting a more dynamic behavioral interaction involving the socially mediated behaviors of a client and the practitioner with whom they interact. Trust between the client and practitioner might be conceptualized as a reliable interaction in which a client independently approaches the practitioner and readily communicates for reinforcers, across contexts, due to a reinforcement history with that practitioner. In other words, *trust is a form of emotional safety*; we may be able to infer that a client "feels safe" if there is some consistency and predictability resulting from an accumulation of reinforcing interactions. Trust and emotional safety are constructs that are difficult to measure despite the possible behavioral correlates mentioned above. As such, a detailed conceptual and functional analysis of emotional safety is beyond the scope of this paper. Nevertheless, the spirit underlying the TIC commitment to ensuring clients feel safe during the course of service delivery is similar to the ethical value of beneficence.

Behavior analysts have argued that safety is a prerequisite to effective treatment (BACB, 2020; UK-SBA, 2020; Van Houten et al., 1988). The *Ethics Code for Behavior Analysts* (BACB, 2020) compels practitioners to not

only describe the objectives of a behavior-change program to clients (code 2.16), but to minimize potential risk in ABA practice and research (code 3.01), and to ensure the selection of the least restrictive procedures necessary for effective treatment (code 2.15). The UK-SBA (2020) *Ethical and Professional Code of Conduct* deserves special mention because the first two principles are to "not engage in or condone harmful, degrading, painful, or dehumanizing practices" and to "ensure their practices and the environments in which they work pose no physical or emotional threat to the safety of the clients, colleagues, or staff" (pp. 2-3). Taken together, ethical guidelines governing the behavior of practitioners and researchers seem to share the value of beneficence toward those receiving ABA services.

Behavior analysts have plenty of tools that can be used in the name of physical safety of both client and practitioner (e.g., protective equipment, physical and mechanical restraint). They have created crisis management associations (e.g., the Professional Crisis Management Association, n.d.) and published handbooks that provide best practice recommendations on how to intervene in dangerous situations to minimize physical harm associated with dangerous behavior (Reed et al., 2013). Although behavior analysts may have a wealth of resources to support physical safety, the handbook on ensuring emotional safety in ABA practice has yet to be written. In other words, when "safety" is invoked in reference to procedures designed to minimize injury (e.g., restraint), such procedures may achieve their intended purpose, but the term may not necessarily imply both physical and emotional safety, and it is unclear the extent to which the client perceives such procedures as safe. We argue that emotional safety and trust should be prioritized to the same degree as physical safety, and that one must not come at the expense of the other. This is not to say that the literature is bereft of strategies aimed at building positive, trusting relationships. For example, some behavior analysts have demonstrated the positive therapeutic effects of pairing a staff person with positively reinforcing stimuli prior to the initiation of demands that might have been previously conditioned as aversive (Curry et al., 2019; Kelly et al., 2015; Lugo et al., 2019; Shillingsburg et al., 2014). These "pairing" or "rapport building" procedures could be considered behavioral approaches to establishing trust. Shillingsburg et al. (2014), for instance, found that programming high-density positive reinforcement prior to instruction effectively reduced behaviors indicative of social avoidance. Although such strategies may prove helpful in establishing the initial foundations of trust, there is a dearth of research aimed at promoting or measuring the maintenance of trust throughout the therapeutic relationship.

A TIC approach to ABA service delivery that ensures safety *and trust* must do so upon initial contact with a new client to begin establishing a reinforcement history for approach responses in a novel context, and therapists should continue to maintain trusting therapeutic relationships for the duration of a client's care. A first step has been described above: ensuring safety involves first acknowledging trauma and its potential impact. Doing so may motivate behavior analysts to reconsider practices implemented in the name of physical safety that may compromise emotional safety. The client who is routinely physically restrained under emergency conditions may be physically safer because of the restraint. However, given that those who deliver ABA services are often those who implement restraint, clients may or may not be emotionally safer while surrounded by the stimuli (i.e., staff) that signal that a restraint could occur at any minute. Insofar as restraints are considered aversive events, Dinsmoor (2001) and Sidman (2001) referred to such stimuli as *warning signals* (e.g., staff that signal an impending aversive event) and provided a cogent argument for why termination of a warning signal was tantamount to the production of a safety

signal.[2] An alternative conceptualization is that the staff who are correlated with the experience of restraint may become reflexive-conditioned motivating operations (Carbone et al., 2010; Crockett & Hagopian, 2006; Michael, 1993) whose removal from the client's environment may have reinforcing properties. The notion that clients may not "feel safe" in the presence of warning signals (i.e., the staff that have restrained them in the past) is exacerbated by the possibility that restraint may occur if the child emits a dangerous response that behavior analysts would readily admit is a product of their learning history. In other words, clients behaving as they ought (Skinner, 1948) because of the prevailing reinforcement contingencies may encounter traumatic events in the form of physical or mechanical restraint, which may erode their experience of both safety and trust.

A TIC approach to ABA that ensures safety and trust will ultimately require careful examination of the conditions under which we implement restraint, for safety or otherwise. We acknowledge that emergencies are bound to occur, and it will likely never be possible and perhaps unwise to completely eradicate physical management procedures from the behavior analyst's toolkit. However, ensuring trust may mean that we make a more concerted effort to eliminate programmatic physical management (e.g., restraints incorporated into a behavior plan) from behavior analytic services, and that we instead leverage behavioral principles to mitigate episodes of escalation by providing all the possible reinforcers for a dangerous behavior to thwart its further escalation (Call & Lomas-Mevers, 2014; Rajaraman & Hanley, 2020; Warner et al., 2020). Reinforcing dangerous problem behavior may seem antithetical to the goal of any behavioral intervention, but when it serves to "turn the

dangerous behavior off" in the moment, it may prevent escalation to behavior that may require restraint and provide the therapist an opportunity to build trust and teach another trial. Doing so may result in reduced frequency with which restraint is implemented in the name of ABA. It may additionally be the case that committing to a TIC approach to ABA leads to research on how to respond to crises without implementing restraint, akin to how fallout from the "aversives controversy" influenced the evolution of research programs that prioritized reinforcement-based interventions for problem behavior (Johnston, 1991; 2006). This may give new voice to those who have investigated procedures that obviate the use of escape extinction (Trump et al., 2020). Further, it may encourage ABA-based organizations to revisit their policies and guidelines in an attempt to minimize the use of restraint (or other forms of punishment) in favor of procedures that may be effective in minimizing escalation while also ultimately treating the problem behavior. Future research should examine immediate and long-term effects of "reinforcing" rather than restraining during episodes of dangerous behavior by evaluating problem behavior, cooperation with adult instruction, frequency of experienced restraint, and social validity of procedures and outcomes from the perspective of the client as well as the practitioner (see Petursson & Eldevik, 2019, for an example of how a reinforcement-based intervention resulted in reduced time in restraint for one client).

Promote Choice and Shared Governance

In the TIC literature, a great deal of emphasis has been placed on integrating procedures and practices that support client control, choice, and autonomy (DeCandia et al., 2014). This core commitment of TIC is considered primarily important in minimizing the risk of retraumatization or of replicating prior trauma dynamics in which the client was or felt

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[2]We acknowledge that it is alternatively possible for restraints to function as reinforcing events, which may engender approach behavior from the client, indicative of trust, toward staff who implement restraints.

powerless. In other words, promoting choice is one way of "helping consumers regain a sense of control over their daily lives" (p. 17; Guarino et al., 2009). Translating this TIC commitment into behavior analytic language does not require egregious stretching of our verbal repertoire because choice-making is a highly researched dependent and independent variable in behavior analysis (e.g., Catania, 1975; Catania & Sagvolden, 1980; Fisher et al., 1992, 1997; Hanley et al., 1997; Herrnstein, 1961; Thompson et al., 1998). Further, choice features as an integral component of ethical practice (BACB, 2020; core principle 2). Catania (2007) defined *choice* as the emission of one among two or more alternative and usually incompatible responses, and *preference* as the selection of one alternative more frequently than another (when provided successive choices). Promoting choice is therefore the act of arranging opportunities for clients to make choices, thereby expressing their preferences.

The concept of shared governance, although not common to the behavior analytic vernacular, also is consistent with behavior analytic practice. It is typically defined as a situation in which all participants in the therapeutic process have a "voice" and operate in collaboration with one another (Holburn, 1997; Moore & Hutchison, 2007). Choice naturally factors into shared governance, as does the concept of social validity (Wolf, 1978). However, in a TIC framework, agreement of goals, acceptability of treatment, and criteria for success would be considered at the outset of the therapeutic relationship and throughout the course of it, rather than a single assessment at the end of the process. The spirit of shared governance is captured in the BACB (2020) ethics code, as it advocates for involving clients and stakeholders in therapeutic decisions (code 2.09). Linking the TIC commitment of promoting choice to ABA practice is an exercise in considering the contexts in which provision of choice would be most likely to yield increased participation in therapy, and in examining the extent to which

ABA practitioners share governance with those whom we serve (Hanley, 2010; Skinner, 1972).

Choice-making opportunities have long been endorsed in the ABA literature, from position pieces outlining client rights to choose (e.g., Bannerman et al., 1990; Holburn, 1997), to investigating objective methods for allowing clients to choose which stimuli should shape their behavior (i.e., preference assessment; e.g., DeLeon & Iwata, 1996; Fisher et al., 1992), to examining the positive therapeutic effects of incorporating choice into interventions for problem behavior (e.g., Dunlap et al., 1994; Peck et al., 1996; Peck-Peterson et al., 2005; Powell & Nelson, 1997; Romaniuk et al., 2002), to lines of research that have examined the relationship between the efficacy of and client preference for various behavioral interventions (Frank-Crawford et al., 2019; Hanley, 2010; Hanley et al., 1997, 2005; Potter et al., 2013). In short, behavior analysts have procedures at their disposal to program multiple choice-making opportunities, from the outset and throughout the therapeutic relationship, for clients in their care.

Hanley (2010) summarized a body of research that described a concurrent chains procedure, which enabled recipients of ABA service delivery to choose the behavioral interventions they would prefer to encounter by repeatedly asking them to pick and experience one among multiple alternative options, thereby expressing their preference for a type of service delivery. Hanley discussed the important difference between asking clients to choose among "items that can be placed in one's hand" and asking to choose among contexts: "behavior-change procedures cannot be placed in one's hand...we are asking about temporally extended interactions with individuals who often show limited verbal ability and who have a limited history with the procedures in question" (p. 15). Hanley's argument coalesced with the notion that all recipients of ABA services, including those who may not be able to socially validate

interventions with their words, should be able to participate in the shared governance of treatment selection and development. In fact, Hanley et al. (2005) used a similar concurrent-chains procedure to allow clients to display preference for interventions for dangerous problem behavior and found that both participating children preferred an intervention package that included a punishment procedure relative to an intervention that relied solely on differential reinforcement. The implications of the findings of Hanley et al. suggest that sharing governance with those receiving ABA services removes our preconceived values of how to treat clients and instead replaces them with client-initiated, data-based values with which to guide treatment selection. Many researchers from independent laboratories have since evaluated client preference for various dimensions of behavioral intervention (e.g., DeLeon et al., 2014; Frank-Crawford et al., 2019; Halbur et al., 2020; Potter et al., 2013). This line of research shows great promise, not only in promoting choice in ABA practice, but also in bridging a gap between ABA and TIC. Such studies have clear implications for a broad approach to incorporating client preferences into the design of behavioral services, thus promoting shared governance.

Ferguson et al. (2019) found that, of 141 studies that reported measures of social validity in the *Journal of Applied Behavior Analysis*, only 6% (eight articles) incorporated intervention choice in their study procedures. These data suggest that choice is rarely incorporated in behavior analytic research, and the extent to which such choices are incorporated into daily behavior analytic practice is even less clear. On the one hand, studies that have examined client preference for various aspects of behavioral interventions, from reinforcer arrangements (e.g., DeLeon et al., 2014; Frank-Crawford et al., 2019), to prompting procedures (e.g., Halbur et al., 2020), to the presence of aversive procedures (e.g., Hanley et al., 2005; Potter et al., 2013), have yielded relatively

consistent findings that help practitioners elucidate common preferences among recipients of ABA services of a certain profile (e.g., children with autism; DeLeon et al., 2014). On the other hand, it is seldom the recommendation from behavior analytic researchers that practitioners incorporate methodology that will enable them to make clinical decisions based on moment-to-moment client preferences. For example, clients often participate in preference assessments; a method for choosing the stimuli that practitioners will program as reinforcers for targeted behavior (e.g., Fisher et al., 1992). However, the preference assessment of reinforcing stimuli is somewhat myopic in that the stimuli identified to be preferred at one point in time may only be fleetingly effective at another point in time.

Hanley (2010) suggested that the everyday practice of behavior analysis should include such choice-making opportunities. We argue that a TIC approach to ABA would include the practical application of procedures similar to those outlined in Hanley as a means of regularly promoting the choice of the recipients of ABA services. Since we have some indication that choice is seldom incorporated into research on behavioral interventions (Ferguson et al., 2019), and because promoting choice is a core commitment of TIC, it seems timely for researchers to investigate the risks and benefits of providing various choices during behavioral intervention. Doing so may lead to the development of best-practice guidelines regarding the provision of choice throughout the course of service delivery.

It is worth mentioning that among the choices offered in some studies is the choice to not participate in treatment whatsoever (e.g., Rajaraman et al., 2021); something that seems especially relevant to a discussion of TIC. Building a sense of control and autonomy in clients means that, in addition to offering multiple options for behavioral treatment, we should also allow clients to abstain from therapy altogether. Doing so may provide a strong test of the degree to which we have established reinforcing

environments replete with safety and trust (Heal & Hanley, 2007). Indeed, Bannerman et al. (1990) cogently argued why it may be important to let clients make choices that in the moment appear counter-therapeutic or non-habilitative (e.g., to eat a donut or take a nap if they so choose).

Emphasize Skill Building

In describing skill building, the TIC literature typically emphasizes client empowerment (Hopper et al., 2010; Moses et al., 2003). Specifically, TIC proponents argue that acquiring adaptive behavior is a form of empowerment, and that recovery from trauma occurs in relationships that support learning and skill development (Moses et al., 2003). Behavior analytic researchers and practitioners are well-positioned to agree with such sentiments given the pervasive focus on skill development in every domain in which behavior analysis has been applied (e.g., Carr & Durand; 1985; Miltenberger et al., 2015; Silverman et al., 2002; Slaton & Hanley, 2016; Tiger et al., 2008; Van Houten et al., 1988). Emphasizing skill building is a cornerstone of ABA (Baer et al., 1968; Ghaemmaghami et al., 2021; Lovaas, 1987; Van Houten et al., 1988). Unlike previous sections of this discussion wherein we argued that ABA practice could benefit from adopting or inquiring about other commitments of TIC, the values underlying an emphasis on skill building are shared by the field of behavior analysis. In fact, this may be an area in which behavior analysis could make meaningful contributions to the efforts of the TIC movement. Put another way, behavior analysts already emphasize skill building, and doing so in light of the other core commitments of TIC may lead to recovery, adaptation, and success for trauma-afflicted clients receiving ABA services.

A defining feature of behavior analysis among psychological disciplines is the commitment to evaluating behavior as a subject matter in its own right (Catania, 2007; Moore, 2015;

Skinner, 1938). As such, behavior analysts are likely to characterize most problems of human behavior, including trauma, as problems of a behavioral deficit or excess. When behavioral deficits are identified, skills are taught and acquired (Ahearn & Tiger, 2013; DeLeon et al., 2013). When behavioral excesses are identified (e.g., dangerous problem behavior), skills are still usually taught and acquired in efforts to "replace" the undesirable behavior with more appropriate, functionally equivalent alternatives (Carr & Durand, 1985; Drifke et al., 2020; Ghaemmaghami et al., 2016; cf., Johnston, 2006). Behavior analysts using a TIC approach would acknowledge the importance of skill building and prioritize treatment approaches that develop skills (e.g., differential reinforcement of alternative behavior) over those that do not (e.g., differential reinforcement of other behavior, noncontingent reinforcement, punishment).

In summary, our proposed framework for incorporating TIC into ABA involves: (a) acknowledging the potential trauma experienced by clients and assuming a universal sensitivity to trauma; (b) curating environments that ensure safety and trust by building and maintaining rapport with clients and identifying alternatives to intrusive restraint procedures (whenever possible), thereby reducing potential retraumatization; (c) promoting client autonomy and shared governance by arranging choice-making opportunities and methods of client validation throughout client intake and treatment development; and (d) choosing intervention options that teach adaptive skills whenever possible. As we noted above, some of these commitments are already aligned with behavior-analytic practice and underpinned by our ethics. Without specifically mentioning trauma, the *Ethics Code for Behavior Analysts* (BACB, 2020) outlines several guidelines that are consistent with a TIC approach, particularly as it relates to promoting client involvement, choice, and self-determination (core principle 2, code 2.09), prioritizing reinforcement-based procedures (code 2.14), meeting the diverse needs of

the client (e.g., trauma history; code 2.14), respecting client preference (codes 2.13, 2.14), obtaining client consent or assent (2.11), and maximizing benefit and reducing harm (e.g., retraumatization; code 2.15, 3.01). Given the unique behavior analytic approach to identifying, analyzing, and addressing behavioral problems, we argue that behavior analysts working within a TIC framework may play a critical role in creating environments to support clients in overcoming the effects of trauma.

Applying a Trauma-Informed Framework to Behavior Analytic Practice

It is well established that a number of factors influence individual responses to traumatic events (Brewin et al., 2000; Harvey, 1996; Trickey et al. 2012) and it may take time for a behavior analyst to determine how these events affect a client's current responding. As we noted above, it may be prudent to err on the side of caution when arranging the therapeutic or research context until more information is gathered. In what follows, we provide some examples of strategies and tactics that might help behavior analysts visualize how TIC could be incorporated into ABA practice in a preventative manner. This approach may be analogous to "tier one" strategies used in a positive behavioral interventions and supports model (PBIS, Sugai & Horner, 2020), whereby employing general, universal strategies both prioritizes prevention and allows quicker identification of those who need more specialized support. We acknowledge that the examples below are speculative, and that more research is needed to identify how this framework might be applied to produce the best therapeutic outcomes. We also acknowledge that much more research is needed to determine the degree to which specific behavioral strategies might be indicated or contraindicated for people with particular trauma histories.

What might a trauma-informed framework look like in practice? First, client assent would be prioritized, such that those receiving therapy, independent of language abilities, would be able to opt in or out of the therapeutic context (i.e., promote choice and shared governance). Consistently opting out would occasion careful analysis of features of the client's environment, so that aversive features might initially be removed, as well as ensuring consistent access to preferred social and nonsocial stimuli to engender "opting back in" (i.e., acknowledge trauma and its impact; ensure safety and trust). Client progress under these initial conditions would then allow therapists to gradually reintroduce routine events while building skills to be effective in their presence.

Second, behavior analysts would actively avoid programming features that might occasion trauma responses (i.e., acknowledge trauma and its impact; ensure safety and trust). Responses to trauma may indeed vary from person to person; however, ACEs are well documented, and a preventative TIC approach would acknowledge their potential impact. For example, considering that some clients may have experienced neglect, therapeutic contexts might be devoid of exclusionary time-out procedures. Rather than relying on extinction, efforts to disrupt contingencies between problem behavior and attention might be addressed by providing attention either noncontingently or for a range of existing responses. Considering that some clients may have experienced emotional, sexual, or physical abuse, manual restraint and physical management procedures would be avoided unless absolutely necessary to ensure physical safety. Moreover, physical prompting as part of a prompt hierarchy or escape extinction procedures involving physical prompting would be largely avoided and certainly reconsidered if their use resulted in any avoidance or emotional responses.

Third, behavior analysts would closely monitor any negative emotional responses to features of the therapeutic setting, behavioral expectations,

or treatment strategies. These features would be adjusted quickly were negative emotional responses to occur (i.e., acknowledge trauma and its impact). For instance, engagement with new instructional objectives often requires working in a particular area, relinquishing preferred items during work sessions, and tolerating response prompting. Let us imagine, however, that while initiating a differential reinforcement procedure to teach the objective, the client protested when asked to come to the work area, cried when relinquishing their preferred item, and attempted to escape physical guidance. The behavior analyst might then adjust the treatment to target more immediate skills, such as transitioning to work areas, relinquishing preferred items, and displaying readiness to learn (i.e., emphasize skill building). Experiences with differential reinforcement of these simpler prerequisite skills would then commence, followed by reintroduction of the original teaching objectives (e.g., Hanley et al., 2014).

Rajaraman et al. (2021) provide another example of employing a trauma-informed framework. An "enhanced choice model" was evaluated with five clients who engaged in problem behavior sensitive to escape (among other reinforcers) and who displayed extreme discomfort (i.e., dangerous problem behavior) when physically managed by others. In this model, participants experienced a modified version of the skill-based treatment initially introduced by Hanley et al. (2014), wherein prompting and differential reinforcement were used to develop communication, toleration, and cooperation skills in the presence of the conditions that were shown to evoke problem behavior in baseline. Modifications unique to the enhanced choice model included (a) providing the ongoing option to participate in the skill-based treatment alongside alternative options to either "hang out" in another space—with noncontingent access to the reinforcers responsible for problem behavior—or to leave the therapeutic context altogether; (b) giving clients details of what to expect in the treatment space—including the most challenging situation they would face— should they choose to engage; (c) arranging opportunities for the client to choose which challenging situations to experience and which skills to practice during adult-led periods; and (d) committing to a hands-off treatment model wherein physical management of the client was prohibited. In other words, although clients were routinely exposed to and taught skills under evocative conditions correlated with their problem behavior (i.e., potentially traumatic events), they (a) were always safe from physical management, (b) had the agency and autonomy to participate in their own treatment throughout the process, (c) shared governance with behavior analysts in the planning of treatment goals, and (d) were taught important social skills to help them navigate evocative situations.

The five children completed the process across a time-frame similar to that reported in other skill-based treatment evaluations (e.g., Hanley et al., 2014; Santiago et al., 2016). All children acquired a complex repertoire of adaptive skills, taught under authentically challenging contexts, and did not engage in any dangerous problem behavior throughout the process and especially at the culmination of treatment, suggesting that the treatment minimized rather than exacerbated risk. Perhaps most important, all participating children independently chose the skill-based treatment context during 96% of opportunities, despite having ongoing options to leave or to go hang out with free access to reinforcers, suggesting they viewed the therapeutic context as both reinforcing and safe.

Conclusion and Future Directions

At the heart of ABA is a focus on problems of social significance, which requires behavior analysts to explore the application of our science to larger societal problems as data pertinent to those problems become available. For

example, behavior analysts have tackled such issues as recycling and energy use (e.g., Clayton & Nesnidol, 2017; O'Connor et al., 2010) as scientists from other disciplines revealed data regarding the impact of human behavior on the environment. More recently, behavior analysts have turned their attention to matters of diversity, inclusion, and social justice, drawing upon literature from related disciplines (e.g., public health) to prescribe a path toward culturally responsive care (e.g., Beaulieu et al., 2019; Fong et al., 2017; Miller et al. 2019). Quite rightly, many behavior analytic organizations and treatment providers have issued revised policies and procedures based on findings produced both within and outside our field (www.apbahome. net). Despite the lack of research on the benefits of a trauma-informed framework (Maynard et al., 2019), it is difficult to deny the data on prevalence of trauma across the range of populations likely to receive ABA services (e.g., Darnell et al., 2019). It is also important to mention that a lack of validation does not necessarily imply that the approach is ineffective or harmful; it simply speaks to the need for more and better research. As noted before, we believe behavior analysts are well positioned to take on this challenge, and such evaluations can occur concurrently within the implementation of a trauma-informed framework. Taking a proactive approach to reducing potential retraumatization and increasing consumer participation seems prudent, and is aligned with the ethics and values that underpin ABA.

Developing a trauma-informed research agenda may also provide an opportunity to reflect on a greater breadth of measures, which could provide a more comprehensive account of treatment outcomes. In light of recent accusations that behavioral treatment approaches are associated with lifelong trauma (Kupferstein, 2018; McGill & Robinson, 2020), incorporating a broader range of measures could help us better understand negative experiences with ABA and provide a more compassionate rebuttal than criticizing the methodological rigor of studies that raise concerns about behavioral treatments (e.g., Leaf et al., 2018). Although follow-up measures of adaptive functioning and mental health issues might be necessary, there are likely more immediate measures that could go a long way in abating concerns about the trauma-inducing nature of behavioral treatments. For example, researchers and clinicians could proactively incorporate measures of client approach (or refusal) to sessions, frequency of choice provision during sessions, and engagement in emotional behavior indicating distress (e.g., crying) as standard operating procedures. Taking a more proactive approach to social validation of goals and procedures might also be useful, whereby these assessments are undertaken in collaboration with clients at the outset of the treatment process, rather than at the end (i.e., promoting choice and shared governance).

A TIC approach to ABA is possible and within reach in most settings in which ABA services are delivered to individuals at risk for having experienced trauma. Although there may be perceived barriers to their adoption, the commitments that define TIC are readily amenable to behavior analytic interpretation and application. Despite the lack of research demonstrating the necessity of TIC being integrated within ABA, we believe that an articulation of benefits to incorporating TIC into ABA practice is warranted, while preferred and nontraumatizing therapeutic conditions are continually researched. Specifically, we believe that this approach could increase the dignity and humanity with which we treat our clients by (a) potentially avoiding traumatizing or retraumatizing clients in our care, (b) increasing the social acceptability of ABA services, and (c) expanding the scope of service delivery to areas where there may be a mismatch between the nature of ABA procedures and the unique problems experienced by certain individuals (i.e., those with a trauma history). A universal embrace of TIC among behavior analysts may also prove fruitful in mitigating current and future concerns regarding how ABA is perceived

by those who have and may experience it (e.g., Kupferstein, 2018). Further research aimed at ameliorating the effects of trauma, as well as "looking inward" at the ways in which our contemporary practices might contribute to trauma, is likely to improve both our practice and public perceptions of our field.

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