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Effects of Acceptance and Commitment Training on Treatment Integrity Amongst Behavioral Technicians

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Abstract

Behavioral technicians (BT) within the field of applied behavior analysis may be at greater risk for experiencing burnout and stress due to the nature of their clients, job demands, and work environments. Burnout and stress may negatively impact BT's work performances, more specifically, their treatment integrity. Acceptance and Commitment Training (ACT) may be a useful tool to address the private events as well as the covert and overt behaviors associated with burnout and stress. The purpose of this study was to investigate the effects of an ACT intervention on improving treatment integrity and reducing work-related burnout and stress amongst BTs. Four BTs participated in an ACT workshop, and their treatment integrity as well as their burnout and stress levels were measured prior to and following the ACT workshop. Treatment integrity increased for all participants, suggesting that ACT-based interventions may be an effective approach to improving work performance (i.e., treatment integrity) amongst BTs who may experience workplace burnout and stress.

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Stress and burnout are common occurrences in any work environment (Plantiveau et al., 2018). Kyriacou (2001) defined stress as unpleasant thoughts and emotions that stem from daily work settings, and burnout is a result of extended periods of work-related stress, which may be caused by several environmental factors (Plantiveau et al., 2018). Since burnout is often the result of prolonged periods of workplace stress, there are different feelings and experiences associated with the two phenomena. The negative feelings associated with stress may present as frustration, tension, and depression due to workplace demands and situations (Howard & Johnson, 2004). Overall, individuals experiencing burnout may describe themselves as lacking in energy and motivation because of their work lives (Aitken & Schloss, 1994).

These thoughts and feelings are private events, which may interact with subsequent observable behaviors (Anderson et al., 2000). When discussing the role of private events in association with employee burnout and stress, it is critical to evaluate the relationship between private events and employee behaviors. Negative feelings linked to burnout and stress may seem arbitrary, but they can often co-occur with employee behaviors due to the correlational nature of overt and covert behaviors (Anderson et al., 2000). Employees experiencing feelings of frustration and depersonalization due to work-related stress and subsequent burnout may also engage in specific observable behaviors that correspond with these private events (Lawson & O'Brien, 1994).

Since stress often leads to burnout, they both have common observable behavioral indicators including absenteeism, turnover, low work performance, and low involvement with colleagues and the organization (Lawson & O'Brien, 1994; Plantiveau et al., 2018; Schuler, 1980). A behavior analytic account of burnout would attribute a decrease in appropriate work-related behaviors to extinction of previously reinforced behaviors (Lawson & O'Brien, 1994). Due to the motivational consequences associated with burnout and stress, behavior analysts may refer to these behaviors as motivational deficits as opposed to skill deficits.

Although individuals in many job sectors experience some levels of stress in their daily lives, extended periods of stress and subsequent burnout is commonly observed in those who work in the human service sector (Howard & Johnson, 2004; Lawson & O'Brien, 1994). Research has shown that there is a relationship between burnout and job performance, which can have critical implications for direct service professionals (DSP) in the human service

sector (Bakker et al., 2014; Plantiveau et al., 2018). However, it cannot be assumed that burnout *causes* poor job performance. Instead, burnout and poor job performance often co-occur in either direction.

Specifically, individuals who work in the field of applied behavior analysis (ABA) may be disproportionately impacted by burnout due to their heightened job demands and pressures (Bottini et al., 2020; Hurt et al., 2013; Plantiveau et al., 2018). These may include rigorous implementation of complex behavior plans, continuous collection of client progress data, support of clients who engage in challenging behaviors, and corresponding with families and other members of the client's team (Bottini et al., 2020; Hurt et al., 2013). Furthermore, ABA-based interventions are often conducted in a one-on-one home setting, where therapists and behavioral technicians (BT) may not contact as much support from co-workers and supervisors as they would in a clinical or school environment (Plantiveau et al., 2018).

Considering their increased job demands and potential lack of supervisor support and job resources, ABA providers may find themselves at risk for experiencing burnout. Considering the correlational relationship between burnout and job performance, this increased susceptibility of burnout can also detrimentally impact clients and recipients of services (Hurt et al., 2013).

To reiterate, one potential correlative indicator of employee burnout is poor job performance. A critical measure of employee job performance in the field of ABA is treatment integrity (DiGennaro et al., 2007). Treatment integrity refers to the degree of accurate implementation of an intervention as intended, where data on treatment integrity provides information on an employee's performance in the implementation of their clients' interventions (Lane et al., 2004). Research has shown that treatment integrity is correlated with intervention effectiveness; some studies have demonstrated that an increase in intervention effectiveness can be tied back to an increase in treatment integrity (Fryling et al., 2012; Sanetti & Kratochwill, 2007). When considering the relationship between burnout and job performance (e.g., treatment integrity), staff impacted by the negative effects and symptoms of burnout and job-related stress may have difficulty in implementing treatments with high treatment integrity (Pingo et al., 2020). An inconsistent and ineffective treatment is potentially detrimental to the progress and success of the client, so it is crucial that instances of staff burnout and poor job performance are identified and addressed (Sanetti & Kratochwill, 2007).

In order to target the private events as well as the covert and overt behaviors associated with burnout and stress, one behavior analytic approach to addressing staff burnout in the workplace may be to use Acceptance and Commitment Training (ACT; Brinkborg et al., 2011; Moran, 2015; Pingo et al., 2020; Waters et al., 2018). ACT is a model of clinical behavior analysis

and therapy, which addresses the relation between private events and socially significant observable behaviors. It is a contextual form of behavior analysis that pivots on acknowledging and accepting covert events that may be classified as negative and unacceptable. When used in practice, ACT does not target the existence of problematic private events but instead looks to modify their functions in relation to specific contexts (Hayes, 2004).

ACT focuses primarily on increasing psychological flexibility while also decreasing cognitive fusion and experiential avoidance through six core processes: acceptance, contact with the present moment, self-as context, defusion, values, and committed action (Hayes et al., 2006, 2013). These core ACT processes complement each other, with acceptance, present moment awareness, self-as context, and defusion enhancing the effectiveness of the behavior change processes of values and committed action in order to increase psychological flexibility. Together, these processes aim to reduce escape-maintained behaviors in favor of values-based action. Waters et al. (2018) described this more simply as using ACT to guide people to engage in reinforcing patterns of behavior while recognizing and accepting unpleasant private events. ACT is best applied and taught using experiential exercises as opposed to didactic learning. Many of these experiential exercises involve the use of metaphors and scenarios as seen in the mindfulness-based processes. This allows individuals to encounter and connect the six core processes in relation to their own experiences (Hayes et al., 2013).

When discussing the usefulness of ACT in the workplace in relation to the six core processes, Moran (2015) described how ACT can be used to train employees to accept the natural, albeit occasionally stressful, private events that can emerge during the workday and to redirect one's own attending behavior back to the stimuli in their present work environment (e.g., work-related tasks). To improve psychological flexibility and flexible perspective taking in the workplace, Moran also explained that employees should be advised on how their self-judgments can influence their behaviors in the work environment as well as their job performance with the goal of encouraging more productive behaviors when faced with the unhelpful private events that precede rigid behaviors. This outcome of promoting employee productivity in relation to the private events associated with burnout may then be accomplished through values clarifications exercises and the completion of values-based actions and may be a good indicator of employee engagement and productivity, while also providing insight into which employees may be experiencing burnout (Moran, 2015).

Research has also examined the impact of ACT on increasing psychological flexibility amongst caregivers or have conducted a separate parent training intervention to examine the overt behaviors of parents with children diagnosed with autism spectrum disorder (Corti et al., 2018; Gould et al., 2018; Magnacca

et al., 2021). Little et al. (2020) examined the effects of using an ACT intervention to enhance the effectiveness of behavioral skills training (BST) and found that the participants increased their implementation of BST after receiving ACT training. Brinkborg et al. (2011) assessed the effectiveness of an ACT intervention for social workers experiencing burnout and stress. While they did not measure observable behaviors as part of their dependent variable, they reported a reduction in the participants' self-reported levels of burnout and stress. Similarly, Waters et al. (2018) conducted a between groups comparison of the use of ACT with clinically distressed health care workers. Their results suggested that an ACT intervention may be effective in supporting distressed health care employees. However, they relied on participant self-report data rather than collecting data on participant behaviors.

ACT has also been evaluated in organizational settings to enhance staff performance, particularly, with human service professionals who are impacted by high levels of burnout and stress (Bond et al., 2006). Pingo et al. (2020) examined the effects of an ACT-based training program in addition to performance feedback on the work performance of DSPs. They measured engagement in appropriate implementation of treatment for clients as well as workplace stress, job satisfaction, and psychological flexibility using several self-report measures. Upon implementation of the ACT intervention, all participants improved their active engagement with client treatments.

While there is some research on the effectiveness of ACT in reducing self-reported levels of burnout and stress among BTs, there has been minimal research on the effects of ACT-based interventions to improve work performance (e.g., treatment integrity) by measuring overt behaviors. The purpose of the current study was to evaluate the effects of an ACT-based treatment on improving treatment integrity and reducing work-related burnout and stress amongst BTs working with individuals who engage in problem behavior. We hypothesized that the ACT treatment would result in improved treatment integrity and decreased self-reported levels of burnout and stress.

Methods

Participants and Setting

The participants were four BTs who were employed by a private consulting company providing ABA-based services in the home and school and one BT employed at a university-based school for children with autism and related developmental disabilities. One of the five participants had to discontinue participation in the study due to staffing changes, so data were collected and analyzed for the remaining four participants.

Hannah was a 23-year-old Caucasian female who was in the ABA field for 3 years, had been working for the private consulting company for 2 years, and was enrolled in a graduate program in ABA. Tina was a 31-year-old Caucasian female who had been in the ABA field for 7 years and had worked for the private consulting company for about 4 years. Sarah was a 34-year-old Caucasian female who had been in the ABA field for 3.5 years, was employed by the private consulting company for 2.5 years, and had a graduate degree in ABA. Sarah had previous experience with ACT a little more than a year before her participation in this study. John was a 23-year-old Caucasian male who had been in the ABA field for 2 years, was employed by the university-based school for 2 years, and had a graduate degree in applied psychology.

This study was conducted in accordance with protocols approved by the University Institutional Review Board, and consent was obtained from all participants prior to the start of the study. Criteria for participation included working with clients who engaged in problem behavior and experiencing varying levels of burnout and/or stress.

All staff performance observations took place while the participants worked in their respective clients' homes or in the classroom of the university-based school. Participants took part in the ACT training from their own homes via remote instruction. No changes were made to the participants' typical work hours or activities.

Response Measurement, Procedural Fidelity, and Reliability

Primary dependent measure. The primary dependent variable was treatment integrity of the participants' implementation of the clients' behavior intervention plans (BIP). Data were collected on the participants' correct and incorrect implementation of the antecedents (e.g., prompts) and consequences (e.g., reinforcement) of the clients' BIP. An opportunity to implement a treatment component was defined as any instance where the participant initiated a component of the client's BIPs. Correct implementation of an antecedent or consequence was defined as implementing the component as described in the client's BIP. Incorrect implementation of an antecedent or consequence was defined as not implementing the component as described in the client BIP. Incorrect implementation included both omission (i.e., participant did not implement a required treatment component) and/or commission errors (i.e., participant implemented a required treatment component incorrectly). BIPs included both behavior reduction and skill acquisition programming.

Treatment integrity was measured by calculating the percentage of opportunities that the participants implemented treatment components correctly as described in the BIP. The number of corrects were divided by the sum of corrects

and incorrects and multiplied by 100 to obtain a percentage of correct implementation for antecedent delivery, consequence delivery, and total treatment integrity (i.e., a combination of antecedent delivery and consequence delivery).

The participants' supervisors or designated data collectors collected treatment integrity data on the participant's implementation of client BIPs. At the private consulting company, the participants' supervising behavior analysts observed the participants as they normally would either in-person or virtually (i.e., Zoom) while collecting treatment integrity data. For the participant at the university-based school, a doctoral-level graduate student was recruited as a data collector for in-person treatment integrity measures due to staffing constraints. Treatment integrity was measured at baseline and then again following implementation of the ACT intervention. Treatment integrity was also collected during 1-week, 2-week, and 1-month maintenance follow-up.

Secondary dependent measures. Three self-report measures were used to collect data on participant's psychological flexibility, burnout levels, and stress levels. All three self-report measures were taken at three separate times over the course of the study: (a) prior to baseline, (b) as each participant completed the ACT treatment, and (c) after the last maintenance probe (1 month for Hannah, Tina, and Sara; 3 weeks for John).

Psychological flexibility. All participants were asked to complete the Multidimensional Psychological Flexibility Inventory (MPFI; Rolffs et al., 2018). The MPFI is an ACT measure used to objectively score the psychological flexibility and inflexibility of participants based on the six core processes of ACT and includes a more comprehensive assessment of the twelve dimensions of the Hexaflex model. The MPFI yields two scores describing participants' flexibility subscales (acceptance, present moment awareness, self-as context, defusion, values, and committed action) and inflexibility subscales (experiential avoidance, lack of contact with the present moment, self-as content, fusion, lack of contact with values, and inaction). Both the flexibility and inflexibility questions were assigned point values on a scale from 1 to 6 (never true to always true) and were then totaled and averaged so that higher scores reflected higher levels of either psychological flexibility or inflexibility. When analyzing participant scores for the MPFI, the goal was to increase flexibility scores (closer to 6) and to decrease inflexibility scores (closer to 1) after implementation of the independent variable.

Burnout. Participants were also instructed to complete the Maslach Burnout Inventory-Human Services Survey (MBI-HSS; Maslach et al., 1986; Mind Garden, 2019). The MBI-HSS is the most common method of measuring

burnout in staff and analyzes emotional exhaustion, depersonalization, and reduced personal accomplishment. Participants responded to questions on the MBI-HSS using a 0 to 6 (never to everyday) scale where each question targeted one of the three dimensions of burnout. Scores were then summed and averaged to reflect a score from 0 to 6 for each dimension: emotional exhaustion, depersonalization, and personal accomplishment. When assessing participant scores for the MBI-HSS, the goal was to decrease emotional exhaustion scores (closer to 0), to decrease depersonalization scores (closer to 0), and to increase personal accomplishment scores (closer to 6) after implementation of the independent variable.

Stress. Participants completed the Perceived Stress Scale (PSS; Cohen et al., 1994), which measured the participants' perceived levels of stress. The PSS provides a general assessment of how individuals view experiences in their daily lives as out of their control, overwhelming, and uncertain (Lee, 2012). Participants responded to the questions on the PSS using a scale from 0 to 4 (never to very often). Individual scores were summed ranged from 0 to 40 with a higher score representing higher levels of perceived stress. Scores from 0 to 13 were considered low stress, 14 to 26 were considered moderate stress, and 27 to 40 were considered high stress. At the end of the study, the goal was for participants to report lowered levels of perceived stress, ideally between a score of 0 to 13.

Social validity. During the 1-month follow-up, participants were asked to complete a social validity questionnaire rating their satisfaction with the ACT workshop as well as the likelihood they would continue to use the learned tools in their daily lives (Appendix A). Participants scored social validity on a 1 to 5 scale (i.e., not satisfied/helpful at all to extremely satisfied/helpful). The questionnaire also included open-ended prompts for the participants to be able to provide feedback on the overall study.

Procedural fidelity. The experimenter leading the ACT treatment had training in and experience with implementing ACT-based interventions for over 5 years. The second experimenter had approximately 1 year of training in and experience with ACT. The experimenter leading the ACT treatment supervised the second experimenter throughout the duration of the study. In addition to the qualifications of the experimenters to be leading the study's ACT intervention, ACT procedural fidelity data were collected on the experimenters' implementation of the ACT treatment for each participant (Appendix B). Each ACT workshop was recorded, and data were collected by two master's-level graduate students. Procedural fidelity was measured using a predetermined checklist of the topics that

were to be covered during the sessions. The experimenters received a plus (i.e., correct) if they discussed the ACT topic during the session, and they received a minus (i.e., incorrect) if they did not discuss the ACT topic during the session. The number of corrects were divided by the number of corrects and incorrects and multiplied by 100 to obtain a percentage of correct implementation. Procedural fidelity was 100%, 100%, 90%, and 100% for Hannah, Tina, Sarah, and John, respectively.

Knowledge checks. The experimenters collected data on the participants' understanding of the ACT concepts to ensure that participants had attended to and comprehended the material (Appendix C). Knowledge checks were conducted during the live ACT workshop for each of the six ACT core processes. Participants were asked to explain the general crux of each process in their own words prior to the experimenters' review and explanation. Participants' responses were rated on a scale from 0 to 2 (i.e., does not mention any keywords to mentions all keywords with accurate definitions). The experimenters then reviewed every core process regardless of the participants' scores on their respective knowledge checks.

Interobserver agreement. A second observer simultaneously collected data via Zoom for 36%, 44%, 38%, and 42% of sessions for Hannah, Tina, Sarah, and John, respectively. Interobserver agreement (IOA) was calculated using the interval-by-interval method by dividing the total number of intervals scored with agreement of both observers by the total number of intervals (i.e., agreement and disagreement) and multiplying by 100. IOA averaged 95% (range, 90% to 100%), 100%, 98% (range, 90% to 100%), and 93% (range, 75% to 100%) of sessions for Hannah, Tina, Sarah, and John, respectively.

A second rater also scored 100% of knowledge checks for all participants. IOA was calculated using the interval-by-interval method by dividing the total number of core processes scored in agreement of both observers by the total number of core processes (i.e., agreement and disagreement) and multiplying by 100. Interobserver agreement averaged 100%, 100%, 83%, and 100% for Hannah's, Tina's, Sarah's, and John's knowledge checks, respectively.

Experimental Design

We used a non-concurrent multiple-baseline across participants design to demonstrate experimental control. A multiple-baseline design demonstrates control through the staggered introduction of the intervention and the corresponding changes to behavior (Kazdin, 2011).

Procedures

The participants implemented behavior reduction plans and skill acquisition programming for their respective clients as originally designed. All participants had received training on their clients' behavior plans at the onset of services with the clients. This training usually involved adaptations of BST along with continued supervisory support. The clients' behavior plans remained constant throughout the duration of the study. All treatment integrity observations were conducted with either the participants' same home clients at the private company or within the same classroom at the university-based school for the duration of this study.

Prior to beginning any baseline measures, all participants were given the three self-report measures to complete. These measures were sent out to each participant via their company email using a HIPAA-compliant drive. Once completed, the participants sent the self-report measures back to the principal investigator to score.

Baseline. Baseline sessions were conducted during the participants' regular session hours with their respective clients. Each baseline session lasted 10 to 20 minutes, with several baseline sessions conducted during a single client meeting. Session lengths varied across participants and were selected based on the supervisors' recommendations regarding the ability to collect sufficient treatment integrity data within the specified intervals. Once a session length was selected for a participant, it was kept constant for the duration of the study (e.g., all of Hannah's sessions were 10 minutes long). Supervisors attended and observed these sessions in-person or virtually as they typically would outside of the study. The participants were expected to continue implementing their clients' BIPs as trained and with no additional support apart from the typical supervisory oversight and assistance. At the start of the session, when the opportunity to implement the behavior reduction plan arose, the supervisor collected treatment integrity data on the participant's execution of the plan as described above. The ACT intervention was only implemented if antecedent delivery, consequence delivery, or antecedents and consequences combined (i.e., total delivery) were consistently below 90%. Once stable baseline responding had been achieved during treatment integrity observations, participants were exposed to the ACT intervention according to the multiple baseline design.

ACT intervention. Following baseline, the experimenters conducted the ACT intervention with each participant using a telehealth modality (i.e., Zoom). All ACT sessions were conducted outside of the participants'

Table 1. Overview of ACT Workshop.

Session	Description	Topics
1	30-minutes pre-recorded video	1. Provide overview of ACT 2. Introduce six core processes
2	2-hours live video conference	1. Discuss of staff obstacles 2. Review six core processes 3. Complete experiential exercises for each core process 4. Complete ACT matrix 5. Develop SMART goals and ACTion plan 6. Assign worksheets and logs
3	30-minutes live video conference	1. Review assignments 2. Modify goals 3. Discuss ACTion plan

normal work hours by the same two experimenters. Intervention consisted of a 3-hour ACT workshop, which was conducted over a week with each participant (Table 1). Each workshop covered the six core processes of ACT and included a combination of didactic and experiential training. At the start of the week (i.e., Monday), participants were sent a 30-minute recording of an overview of ACT and the six core processes. This pre-recorded video was sent to participants approximately 24 hours before the start of the live workshop to allow them sufficient time to view the video. The experimenters then met with the participants at the predetermined time for a 2-hour live video conference to review the concepts discussed in the previous recording and to guide the participants through experiential exercises. This live conference involved the completion of mindfulness practices and ACT-based exercises, the identification of values and committed actions for behavior change (i.e., goal setting), and the discussion of assignments to be completed throughout the rest of the week (adapted from Flaxman et al., 2013; Harris, 2007; Moran & Ming, 2022; Polk et al., 2016; Stoddard & Afari, 2014; Table 2). For example, one ACT exercise that participants completed was a mindfulness exercise called Five Senses. During this exercise, participants tacted stimuli in their current environment using their five senses to increase their engagement in present moment awareness. Another exercise that participants completed was the Lifetime Achievement Award. This exercise assisted the participants in values clarification by prompting them to identify some of the values they would be recognized for if presented with this award.

Table 2. Guide for the Live Video Conference.

Topic	Description
Discussion of staff obstacles	1. Description of participant cases 2. Discussion about experiences with burnout and stress 3. Discuss impacts on work and personal life 4. Review baseline self-report surveys
Present moment awareness	1. Check-in/knowledge check for understanding 2. Review present moment awareness 3. Mindfulness exercises a. Five senses b. Leaves on a stream
Acceptance	1. Check-in/knowledge check for understanding 2. Review acceptance 3. Acceptance exercises a. Don't think about a puppy b. Beachball metaphor c. Building a house
Defusion	1. Check-in/knowledge check for understanding 2. Review defusion 3. Defusion exercises a. Defy your mind b. Noticing/cutting the string/popping the bubble
Self-as context	1. Check-in/knowledge check for understanding 2. Review self-as context 3. Self-as context exercises a. "I am. . ."
Values	1. Check-in/knowledge check for understanding 2. Review values 3. Values exercises a. Lifetime achievement award b. Values clarification checklist
Committed action	1. Check-in/knowledge check for understanding 2. Review committed action 3. Committed action exercises a. Life ladder
The ACT matrix	1. Introduce and describe purpose of ACT Matrix 2. Fill in ACT Matrix with participants
Develop SMART goals and ACTion plan	1. Complete SMART goals worksheet with participants to identify immediate goals and values-based actions for the upcoming week 2. Review optional worksheet for personal ACTion plan
Assign worksheets and logs	1. Passengers on the bus metaphor 2. Assign "homework" a. ACT Daily Diary b. Self-monitoring worksheet on values-based actions

About a week later (i.e., the following Monday), the experimenter conducted a 30-minute live follow-up video conference with the participants to review their assignments, discuss their experiences with engaging in their values and committed actions, and modify any goals as necessary. The participants sent back all corresponding assignments and logs to the experimenter for review. Upon completion of this follow-up, participants were prompted to complete the three self-report measures. Participants were also given the option to be able to take part in a check-in scheduled for the week following the ACT workshop in order to discuss any additional questions or concerns.

Upon completion of the ACT workshop, the supervisors were instructed to collect treatment integrity data during the participants' next scheduled client sessions with supervisor overlap. Post-intervention treatment integrity data collection included the same procedures as in the baseline condition, with no additional feedback provided regarding their treatment integrity performances. The time between the end of the ACT workshop and the start of post-intervention data collection typically varied between participants due to scheduling differences but was no more than 1 week for Tina, Sarah, and John. This interval was longer for Hannah, about 3 weeks, due to Hannah's client being quarantined as a result of COVID-19 restrictions.

The criterion to move onto the maintenance phase was treatment integrity at 90% or higher across three consecutive sessions during post-intervention data collection. If post-intervention treatment integrity data were below 90% over four out of five sessions, then a BST phase was initiated unless the data were on an increasing trend. The participants never met this criterion, so BST was not implemented.

Maintenance. Supervisors collected maintenance probes to assess if participants were maintaining their post-intervention treatment integrity. Supervisors or designated data collectors conducted probes 1 week, 2 weeks, and 1 month following the last post-intervention session. Maintenance probe data for John were collected 2 and 3 weeks following the last post-intervention data point due to the university-based school's summer closure schedule. Maintenance probes used the same data collection procedures as in the baseline condition. If participants' treatment integrity fell below 90% during maintenance, they were prompted to complete an ACT check-in with the experimenter to review their goals and values-based actions, which was similar to the optional check-in offered at the completion of the ACT workshop. If the next maintenance probe following the check-in resulted in treatment integrity below 90%, then the BST phase was initiated. However, the participants never met this criterion, so BST was not implemented. Participants were not provided feedback on their treatment integrity performance.

Results

The percentage of correct implementation for each opportunity to conduct a BIP component (i.e., consequence delivery or total delivery) for Hannah, Tina, Sarah, and John during baseline, post-intervention, and maintenance are depicted in Figure 1. These were the specific behaviors targeted during post-intervention data collection depending on baseline mastery criteria for each participant. The data in Figure 1 demonstrate experimental control and show a functional relationship between independent variable (e.g., ACT intervention) and the dependent variable (e.g., treatment integrity). To demonstrate this experimental control, the experimenters used baseline logic within a non-concurrent multiple-baseline design, meaning that the intervention was only introduced for the next participant in the multiple-baseline once stability in data was observed for the previous participant's treatment integrity post-intervention. For example, the intervention was implemented with Tina once Hannah's consequence delivery was stable during post-intervention data collection to demonstrate experimental control.

Hannah's treatment integrity for antecedent delivery was consistently above 90%. Therefore, we only focused on Hannah's consequence delivery. During baseline, Hannah consistently implemented consequence components of the client's BIP below the 90% benchmark (Figure 1, Top Panel). She made both omission and commission errors during baseline. Post-intervention data collection was delayed for Hannah due to her client being quarantined as a result of COVID-19 restrictions. Once post-intervention data were collected following the quarantine protocols, Hannah's consequence delivery was initially on a downwards trend but then increased again to meet mastery criteria. We therefore transitioned to the maintenance phase. During the 1-week maintenance probe, consequence delivery fell below the 90% benchmark, so Hannah was prompted to complete an ACT check-in with the experimenter. After the ACT check-in, Hannah's performance increased and treatment integrity remained at 90% correct during the 2-week and 1-month maintenance probes.

During baseline, both Tina's antecedent and consequence delivery were consistently below the 90% treatment integrity target, so Tina's total delivery (i.e., antecedent delivery plus consequence delivery) was targeted for post-intervention data collection (Figure 1, second panel). Tina made both omission and commission errors during baseline. Upon implementation of the ACT intervention, Tina's total delivery immediately increased to meet mastery criteria with 100% treatment integrity during the first three post-intervention sessions. Tina's performance also maintained above the 90% criterion during the maintenance phase during the 1-week, 2-week, and 1-month probes.

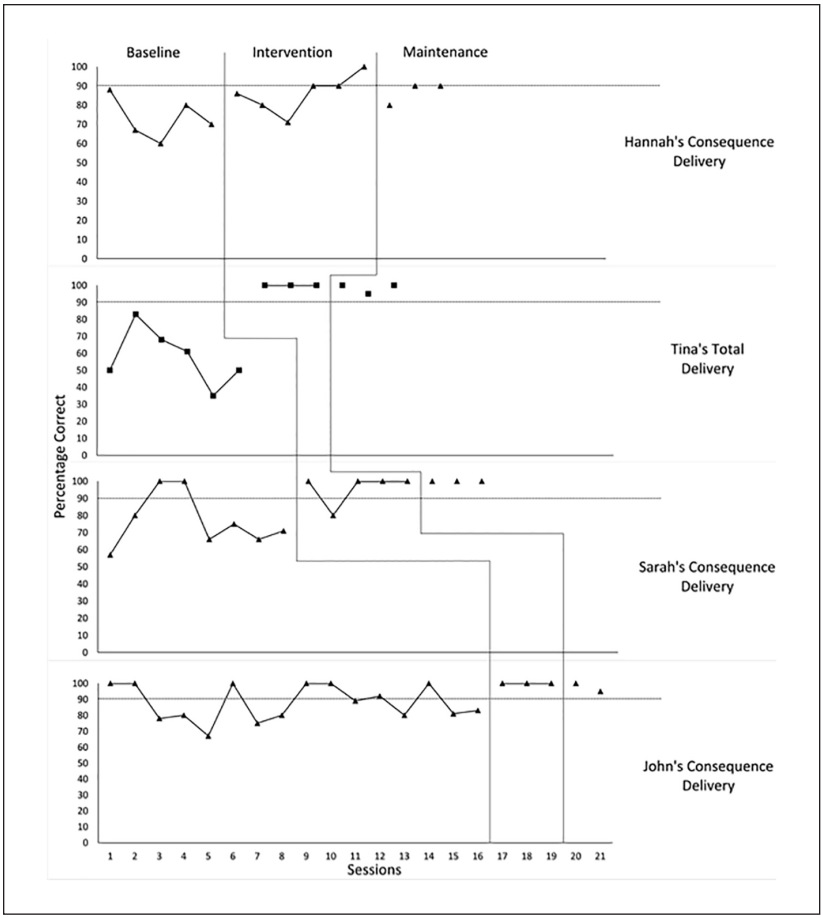

Figure 1. Participant behaviors targeted during intervention.
Note. This figure illustrates the participants' delivery of treatment integrity components (i.e., consequence delivery, total delivery) that were targeted during intervention.

During baseline, Sarah implemented antecedent components of the client's treatment at 100% across three consecutive sessions. Sarah's baseline consequence delivery initially began on an increasing trend but eventually stabilized below the 90% criterion (Figure 1, third panel); therefore, we only focused on Sarah's consequence delivery. She made both omission and commission errors during baseline consequence delivery. Following the ACT intervention, Sarah's consequence delivery increased compared to baseline,

and she met mastery criteria to move on to the maintenance phase after five sessions. During the maintenance phase, Sarah's consequence delivery remained at 100% across the 1-week, 2-week, and 1-month probes.

Baseline antecedent component delivery for John was generally variable and on a downward trend but then stabilized at or above the exclusion criteria. During baseline, John's consequence component delivery for his client's BIP was consistently variable below the 90% benchmark (Figure 1, bottom panel). He made both omission and commission errors during baseline. John was also transferred to a different classroom during baseline observations. Treatment integrity observations with John in the new classroom began at the 12th baseline session; but there were no differences observed in his consequence treatment integrity following this change. Since John's consequence treatment integrity was so variable, there was room for improvement in the stability of his performance following implementation of the intervention. Upon implementation of the ACT intervention, the stability of John's consequence delivery increased to meet mastery criteria with a consequence treatment integrity of 100% across the first three post-intervention sessions. John's performance also maintained above the 90% mastery criteria during the maintenance phase during the 2- and 3-week probes.

Self-report data on psychological flexibility, burnout, and stress were collected at three separate points during the study. Participants completed the MPFI, the MBI-HSS, and the PSS prior to baseline, after the ACT intervention, and after the last maintenance probe. Initial self-report surveys were discussed during each participants' ACT workshop, and the experimenter monitored the completion of subsequent self-report surveys to evaluate any effects of the independent variable on the participants psychological flexibility, burnout, and stress levels. The averages or sums for each self-report survey for Hannah, Tina, Sarah, and John during baseline, post-intervention, and maintenance are depicted in Table 3.

During baseline, Hannah's psychological flexibility scores were on the lower end of the 6-point scale with a score of 2.4, while her inflexibility scores were on the higher end of the scale with a score of 3.6. After implementation of the ACT intervention and during her 1-month follow-up, Hannah's psychological flexibility scores had increased to 4.6, and her inflexibility scores had decreased to 2.1. Hannah's MBI-HSS scores demonstrated the starkest change when comparing her baseline and 1-month maintenance scores. During baseline, Hannah rated her overall work-related emotional exhaustion, depersonalization, and personal accomplishment as 4.7, 2.6, and 3.8 respectively on a 6-point scale. By the 1-month maintenance probe, her reported emotional exhaustion and depersonalization had decreased to 2.4 and 1.6 while her reported personal accomplishment scores had improved to

Table 3. Self-Report Scores.

		MPFI		MBI-HSS			
Participant	Timeline	Flexibility	Inflexibility	Emotional exhaustion	Depersonalization	Personal accomplishment	PSS
Hannah	Baseline	2.4	3.6	4.7	2.6	3.8	27
	Post-intervention	3.7	2.6	4.7	1.4	5.0	19
	1 month maintenance	4.6	2.1	2.4	1.6	5.1	8
Tina	Baseline	3.1	2.2	1.1	0.0	5.5	14
	Post-intervention	3.7	2.3	0.1	0.0	5.2	15
	1 month maintenance	4.8	1.5	0.2	0.0	5.6	11
Sarah	Baseline	4.6	2.4	2.3	0.2	5.0	15
	Post-intervention	4.3	2.7	2.4	0.4	5.1	12
	1 month maintenance	5.0	1.9	1.1	0.2	5.3	7
John	Baseline	4.0	1.9	0.5	0.0	5.2	9
	Post-intervention	4.5	1.4	1.6	0.4	5.6	6
		Flexibility	Inflexibility	Emotional Exhaustion	Depersonalization	Personal Accomplishment	
	3 week maintenance	4.9	1.3	1.5	0.4	5.5	4

Note. The MPFI included flexibility and inflexibility measures scored on a scale of 1 to 6, with a desired increase in flexibility scores and a decrease in inflexibility scores. The MBI-HSS included emotional exhaustion, depersonalization, and personal accomplishment measures scored on a scale of 0 to 6, with a desired decrease in emotional exhaustion scores, a decrease in depersonalization scores, and an increase in personal accomplishment scores. The PSS was scored on a scale of 0 to 4, with a total possible score of 40 and a desired decrease in PSS scores.

a 5.1 out of 6. Hannah's perceived stress from the PSS also decreased from a score of 27 at baseline to an 8 at the 1-month maintenance probe, indicating that she had high levels of perceived stress at baseline, which then improved to lower levels of perceived stress during the probe. Based on the results of Hannah's MPFI, MBI-HSS, and PSS scores, Hannah may have demonstrated increased psychological flexibility and decreased inflexibility in response to the aversive private events associated with work-related burnout and stress after experiencing the ACT workshop.

During baseline, Tina reported moderate levels of psychological flexibility with a score of 3.1 and lower levels of inflexibility with a score of 2.2. After implementation of the ACT intervention and during her 1-month follow-up, Tina's psychological flexibility scores increased to 4.8, and her inflexibility scores further decreased to 1.5. During baseline, Tina also reported low levels of burnout on the MBI-HSS with a 1.1 emotional exhaustion score, a 0.0 depersonalization score, and 5.5 personal accomplishment score. Tina's burnout levels continued to decrease through the 1-month maintenance follow-up with a 0.2 emotional exhaustion score, a 0.0 depersonalization score, and 5.6 personal accomplishment score. Despite her low levels of burnout, Tina did report experiencing moderate levels of perceived stress during baseline with a score of 14 on the PSS. During the 1-month maintenance probe, Tina's reported perceived stress levels decreased slightly to a score of 11, indicating that she was experiencing low levels of perceived stress. Despite her lower reported levels of burnout and stress during baseline, Tina may have been engaging in higher levels of psychological flexibility and decreased levels of inflexibility after her participation in the ACT workshop as illustrated by her MPFI, MBI-HSS, and PSS scores.

During baseline, Sarah's psychological flexibility scores were already on the higher end of the 6-point scale with a score of 4.6, while her inflexibility scores were on the lower end of the scale with a score of 2.4. After implementation of the ACT intervention, Sarah's reported psychological flexibility slightly decreased and her reported inflexibility slightly increased. However, Sarah's psychological flexibility scores further increased in comparison to baseline to 5.0, and her inflexibility scores decreased again to 1.9 during her 1-month maintenance follow-up. Sarah's MBI-HSS scores followed a similar trend to her MPFI scores. During baseline, Sarah rated her overall work-related emotional exhaustion, depersonalization, and personal accomplishment as 2.3, 0.2, and 5.0 respectively on a 6-point scale. Despite the slight increases in emotional exhaustion and depersonalization scores observed immediately after the intervention, her reported emotional exhaustion and depersonalization had decreased to 1.1 and 0.2 while her reported personal accomplishment scores had improved to a 5.3 out of 6 during the 1-month maintenance probe. While

Sarah did report moderate levels of perceived stress at baseline with a score of 15, her PSS score also decreased to indicate low perceived stress with a score of 7 during the 1-month maintenance probe. Even though Sarah had previous experience in ACT prior to the start of this study, the results of her MPFI, MBI-HSS, and PSS scores indicate that she may have been engaging in higher levels of psychological flexibility and decreased levels of inflexibility after her participation in the ACT workshop.

During baseline, John reported moderately high levels of psychological flexibility with a score of 4.0 and lower levels of inflexibility with a score of 1.9. After implementation of the ACT intervention and during his 3-week follow-up, John's psychological flexibility scores further increased to a score of 4.9 and his inflexibility scores further decreased to 1.3. During baseline, John also reported low levels of burnout on the MBI-HSS with a 0.5 emotional exhaustion score, a 0.0 depersonalization score, and 5.2 personal accomplishment score. While John's burnout levels slightly increased through the 3-week maintenance follow-up with an emotional exhaustion score of 1.5 and a depersonalization score of 0.4, his overall burnout levels were still considerably low. It is also important to note that John's personal accomplishment scores did increase slightly to a 5.5. Similar to his burnout levels, John also reported experiencing low levels of perceived stress during baseline with a score of 9 on the PSS. During the 3-week maintenance probe, his perceived stress continued to decrease to lower levels with a score of 4. Based on the results of John's MPFI, MBI-HSS, and PSS scores, John may have demonstrated increased psychological flexibility and decreased inflexibility after experiencing the ACT workshop despite the potential increase in aversive private events associated with work-related burnout and stress.

The participants were completed a social validity questionnaire after their last maintenance session (Table 4). Based on the results of the social validity measure, it appears that all of the participants found the ACT workshop to be helpful in both their professional and personal lives and would either most likely or definitely continue to use the learned tools in both aspects of their lives. All participants also reported high overall satisfaction with the workshop and enjoyed the concise yet detailed manner in which the content was presented. Anecdotally, participants also seemed to appreciate the frequent check-ins provided during the intervention. While all participants were informed of the timetable for intervention meetings and for completion of the self-report surveys, one participant noted that a printed schedule outlining this timetable would have also been useful. Overall, participants found the ACT workshop to be a valuable experience for both their professional and personal lives.

The experimenter rated the participants' understanding of the ACT concepts and material presented during the pre-recorded ACT video. Knowledge checks

Table 4. Social Validity Results.

Questions	Hannah	Tina	Sarah	John
How satisfied were you with the content/areas that were covered during the ACT workshop?	5	5	5	4
How satisfied were you with the format of the ACT workshop?	4	5	5	5
What is your overall satisfaction with the ACT workshop?	5	5	5	5
How relevant and helpful was the ACT workshop for you personally?	5	5	5	4
How relevant and helpful was the ACT workshop for you professionally?	5	5	5	5
What is the likelihood that you will continue to use the strategies you learned during the workshop in your personal life?	Definitely	Definitely	Definitely	Definitely
What is the likelihood that you will continue to use the strategies you learned during the workshop in your clinical practice?	Probably	Definitely	Definitely	Definitely

Note. Questions were rated from 1 = not satisfied/helpful at all to 5 = extremely satisfied/helpful.

were conducted during the live ACT workshop for each of the six ACT core processes (Table 5). Hannah's, Tina's, and John's ratings were relatively low. Therefore, when reviewing each core process during the live ACT session, the experimenters provided more examples for the core processes with which they had lower ratings. Sarah's ratings were higher, most likely because she had previous experience in ACT before the start of this study.

Discussion

The purpose of the current study was to evaluate the effects of an ACT-based intervention on improving treatment integrity and reducing work-related burnout and stress amongst ABA professionals working with individuals who engage in problem behavior. Following implementation of the ACT intervention, all participants demonstrated increases in their work performances (i.e., treatment integrity), and they maintained their performances for up to 1 month. In addition to their improved treatment integrity, all participants reported engaging in higher levels of psychological flexibility, and three of the participants had decreased

Table 5. Participant Knowledge Check Scores.

Core process	Hannah	Tina	Sarah	John
Present moment awareness	1	0	2	0
Acceptance	1	2	2	1
Defusion	1	0	2	1
Self-as context	0	0	2	1
Values	2	1	2	1
Committed action	0	1	2	2

self-reported levels of burnout and stress in comparison to their respective baseline levels.

This study extends previous research by evaluating the efficacy of an ACT intervention on directly observed treatment integrity. Our results suggest that ACT may be a useful tool in reducing burnout and stress amongst BTs. This study also adds to the existing ACT research by examining the effects of ACT to improve work performance (i.e., treatment integrity) through the measurement of overt behaviors and suggests that ACT-based interventions may be an effective approach to improving work performance.

Considering the importance and necessity of high-quality work performance within the delivery of ABA services, these results may have critical implications for BTs and their respective clients in the field. BTs within the ABA field may find themselves at risk for experiencing job-related burnout and stress with potential negative impacts on work performance due to the correlational nature between burnout and work performance. ACT-based interventions and strategies may be beneficial in addressing these aversive private events and their relation to work performance in order to improve and better support BTs' work performances. While this study focused on work performance in the form of treatment integrity, previous research has supported the use of ACT to improve work performance by way of active engagement with client treatments (Pingo et al., 2020). ACT may be a useful tool in improving treatment integrity within ABA and may be helpful for DSPs in other human service fields as well.

These results may also impact client outcomes. The improvements in staff treatment integrity observed during this study may have exposed clients to more consistent and rigorous treatments, which may lead to more successful client outcomes. The current study did not measure client outcomes through the course of the study, but future research might look to assess how specific client outcomes (i.e., progression through treatment plans) might be impacted by an ACT-based intervention for staff.

It is important to highlight that the benefits of the ACT intervention used in this study would be more useful for staff experiencing motivational deficits in relation to poor treatment integrity as opposed to skill deficits. The results of this study suggest that the motivational deficits often associated with burnout and stress can potentially be targeted with the behavior-change agents used during the ACT intervention due to the correlational nature between private events and observable behaviors. For example, during Hannah's ACT intervention, she reported experiencing a lack of motivation due to burnout on her client case. As a result, Hannah identified values and formulated committed actions during the ACT workshop to target these motivational deficits. After the ACT workshop, Hannah's self-report scores illustrated lower levels of burnout and increased motivation while her treatment integrity substantially increased, indicating that the ACT workshop may have been effective in addressing the private events and observable behaviors correlated with her motivational deficits.

It is also interesting to note that even though Tina reported low levels of burnout and high levels of motivation prior to the ACT intervention, her treatment integrity increased post intervention. While private events (e.g., burnout) do not cause poor work performance (e.g., treatment integrity), they still often co-occur. These findings highlight the importance of not relying solely on self-report data when examining the effects of ACT-based interventions. Self-report data and anecdotal evidence are not direct as in data collected on overt behaviors due to inherent individual biases. Even though Tina reported low levels of burnout and high levels of motivation prior to baseline and during the ACT workshop, her treatment integrity measures revealed a need for intervention. Since Tina's treatment integrity improved considerably after the ACT intervention without the need to implement BST, she may have been experiencing motivational deficits instead of skills deficits in relation to her client's treatment despite her indirectly measured self-report scores. If Tina's treatment integrity had not improved after implementation of the ACT workshop, BST would have been necessary, which might have been indicative of skill deficits as opposed to motivational deficits. Future research can attempt to pinpoint the aspects of ACT that address motivational deficits and further analyze if ACT can be useful for skill deficits.

While the effectiveness of the ACT intervention can be observed in the participants' treatment integrity, some anecdotal data may be of significance when considering the implications of ACT beyond the workplace. During the ACT check-in, all participants reported using the tools and experiential exercises learned during the workshop in their daily lives. Some participants also recorded these behaviors on their daily self-monitoring worksheets. Apart from completing their identified values-based actions and goals in relation to their

work lives, participants also reported engaging in greater psychological flexibility when faced with aversive private events associated with school work, house work, and family lives. Even though the goal of the current study was to use ACT in order to improve work performance, the benefits of the intervention may have extended beyond its intended goal by positively impacting participants' personal lives as well.

One potential limitation of the current study is staff reactivity during observations of treatment integrity during client sessions. Reactivity may have been a factor in the initial increases in performance observed during baseline for all participants. With continued observation, however, all participants' baseline work performance stabilized with lower treatment integrity scores. The experimenter attempted to counteract the effects of staff reactivity by designating the participants' work supervisors as the primary treatment integrity data collectors since this was considered the norm for all participants. The experimenter also calculated IOA through a telehealth modality in order to be as covert as possible during these observations. To further limit the impacts of reactivity, future research can conduct more unobtrusive observations of work performance by either videotaping sessions or by potentially using prior work performance history as a baseline.

The participant sample in this study may also be another limitation. All of the participants volunteered to take part in this study. While the experimenters did screen volunteers based on the inclusion criteria, self-selecting participants may not have reported exceedingly high levels of burnout and may have exhibited average, as opposed to poor, work performance (e.g., treatment integrity). Therefore, even though some of the participants in this study did report experiencing moderate levels of burnout and below average or inconsistent work performance, they may not all of have fit the intended participant sample.

Another possible limitation is the length of treatment integrity observations. Due to the shorter 10 to 20 minutes intervals used for treatment integrity observations, the participants' supervisors were able to collect several data points within a single client observation session. This provided the opportunity to collect most of the treatment integrity measures over a shorter period of time (i.e., two to three client sessions). While this data collection method was more time efficient for the purpose of this study, using longer time intervals might have yielded a more accurate representation of the participants' treatment integrity over time. In order to minimize the effects of this limitation, maintenance data were collected to better observe the participants' performance across a longer period of time.

We identified a minimum of 90% correct implementation as optimal treatment integrity as the mastery criterion during post-intervention and maintenance data collection. This criterion was based on the experimenters' clinical

experience and expectations. However, this may be a possible limitation since this minimum optimal treatment integrity criterion is an arbitrary number that was identified based on the experimenters' own experiences and biases. Future research can find a more systematic method for determining optimal treatment integrity.

There was also the potential for observer or rater bias (i.e., supervisors, doctoral student) of participant treatment integrity. The data collectors were aware of the purpose of this study and were also informed about the end of baseline treatment integrity measures and the start of post-intervention treatment integrity measures, so observer bias may have influenced the participants' improved treatment integrity after implementation of the ACT intervention. However, average IOA data for treatment integrity measures were high, so rater bias may not have been as impactful on the results of this study. Future research can use blinded observers to phase progression so that they are not aware of the transition between baseline and post-intervention data collection.

The overall generality of the treatment integrity data sheets used in this study may also be a limitation. The data sheets were not tailored to the clients' specific BIPs, so data were collected on any instance of treatment implementation as opposed to a specific checklist of treatment components for each client. This may not have provided a detailed enough representation of the participants' treatment integrity and could have affected the results of baseline and post-intervention data collection. While the principal investigator attempted to increase the specificity of treatment integrity measures by breaking down treatment delivery into antecedent components and consequence components, future studies can use client specific treatment integrity checklists to assess if more precise data sheets will yield different treatment integrity results.

We did not assess the function of staff behaviors during baseline and prior to implementing the ACT intervention. Therefore, it is not known for certain whether low staff performance during baseline was correlated with motivational deficits or skill deficits. Although participants had received prior training on their respective clients' BIPs, there was no standard or minimal level of competency identified for each participant prior to the start of the study. Despite the fact that all of the participants had been trained to implement their client BIPs prior to this study, they continued to exhibit relatively low or inconsistent treatment integrity. Still, because it was unclear if participants were trained to a minimal level of competency prior to this study, another potential limitation involves the possibility of skills deficits associated with the participants' work performance due to insufficient training. To minimize this limitation, self-report data were collected to indirectly evaluate participant burnout and stress levels, but direct and observable measurements of motivation were not assessed. Since the ACT intervention was tailored to target the motivational deficits associated

with low work performance, participants with skill deficits may not have received maximum benefit without the addition of BST to the intervention. However, all participants in this study met treatment integrity mastery criteria after implementation of the intervention, suggesting they benefited from the ACT training. Future studies should determine the function of poor staff performance by possibly collecting ABC data on staff behaviors to better individualize the intervention or by ensuring staff training to a minimal level of competency.

Another potential limitation of this study is the lack of a strong demonstration of a treatment effect. While the experimenters used baseline logic to show a functional relationship between the independent variable and the dependent variable, there are still overlapping data points between baseline and post-intervention data for Hannah's, Sarah's, and John's treatment integrity, which may weaken demonstration of a treatment effect. Additionally, there is a slight ascending baseline level of Hannah's treatment integrity prior to the implementation of the intervention without clear change in the level of Hannah's treatment integrity during post-intervention data collection. However, all of the participants' treatment integrity measures were either inconsistent or below the mastery criterion during baseline, thus providing a clinical justification for implementing the intervention with each participant to better support the integrity of client services. Improvements were observed in the level and variability of Tina's, Sarah's, and John's treatment integrity upon the staggered implementation of the intervention, thus demonstrating experimental control and showing a functional relationship between the independent variable and the dependent variable.

While the experimenters were qualified to be leading the study's ACT treatment, the nature of the procedural fidelity measures for the ACT treatment itself may be considered as a limitation. Measures of procedural fidelity included whether or not an ACT topic was discussed during the sessions but did not include further elaborations on the quality of the specific ACT tools used by the experimenters. As such, future research can include broader measures of procedural fidelity for ACT treatments by including in-depth measures involving the quality of the discussions surrounding the ACT metaphors and experiential exercises used.

One final limitation of the present study is that a component analysis was not conducted to analyze which elements of the ACT workshop were required for behavior change. During the ACT workshop, participants learned about each of the six core processes and were prompted to complete the corresponding experiential exercises. Anecdotally, most of the participants expressed their need to engage in more present moment awareness, to better identify their values, and to follow through on their values-based actions, or committed actions. Consequently, the experimenters attempted to address this limitation by dedicating more time to discussing these core processes if requested. Future

studies can conduct component analyses of this intervention to evaluate which aspects of the six core processes were necessary and most effective. Since the ACT intervention in its entirety was implemented over the course of 3 hours, pinpointing the most effective components of the intervention may also be more time efficient while also increasing participant willingness and buy-in.

Since the goal of the present study was to improve work performance amongst staff experiencing a co-occurrence of work-related burnout and stress, future studies should analyze intervention effects on staff in greater distress and reporting higher levels of burnout and stress. This may be achieved by including staff who have worked in the field of ABA for longer periods of time (i.e., 10+ years) or have faced disciplinary action within their respective organizations. This will allow future researchers to assess if an ACT intervention will be as effective in improving the work performance of staff experiencing co-occurring higher levels burnout and stress as in staff experiencing co-occurring low to moderate levels burnout and stress.

The purpose of this study was also to increase staff performance on cases that were specifically identified for intervention. All of the participants' performances increased and maintained over time on their chosen cases. However, it would also be clinically appropriate to assess if the intervention effects would generalize to other cases on the participants' caseloads. Future research could test the generalization of intervention effects by collecting baseline and post-intervention data on several of the participants' cases to determine if an ACT workshop to improve staff performance on one particular case would also improve performances on their other cases. Depending on the results, this may provide wider clinical benefits to both staff and clients.

One final suggestion for future research includes the systemic adoption of the ACT intervention in order to target the organizational consequences associated with employee burnout. In addition to evaluating the effects of ACT in relation to staff work performance, researchers can also assess the use of ACT to reduce staff tardiness and absenteeism, decrease turnover rates, and to improve overall employee satisfaction. A systemic adoption of the ACT intervention may also involve including a mentor/mentee relationship between employees and supervisors as part of the intervention to ensure continued practice of the learned ACT tools as well as the maintenance of any observed intervention effects. This may be conducted in a variety of organizational settings including ABA organizations and beyond.

Despite these limitations, this study contributes critical implications for DSPs both within and outside of the field of ABA. The results of this investigation provide preliminary evidence for the use of ACT to improve performance of staff also experience a co-occurrence of burnout and stress. They also highlight the need to proactively identify employees who may be experiencing aversive private events related to burnout and stress based on potentially

correlated observable behaviors due to the indirect nature of employee self-reports. Future research could implement this intervention with other DSPs to test for generalization of intervention effects across various fields (i.e., social work, nursing, education). With further examination, this can potentially pave the way for higher quality staff performance, more consistent treatment implementation, and improved client outcomes. This may not only increase the integrity of behavior analysis as a science but also as a practice.

Appendix A

Social Validity Questionnaire

On a scale of 1 to 5, how satisfied were you with the content/areas that were covered during the ACT workshop?

Not at all 1 2 3 4 5 Extremely satisfied

On a scale of 1 to 5, how satisfied were you with the format of the ACT workshop?

Not at all 1 2 3 4 5 Extremely satisfied

On a scale of 1 to 5, what is your overall satisfaction with the ACT workshop?

Not at all 1 2 3 4 5 Extremely satisfied

On a scale of 1 to 5, how relevant and helpful was the ACT workshop for you personally?

Not helpful at all 1 2 3 4 5 Extremely helpful

What is the likelihood that you will continue to use the strategies you learned during the workshop in your personal life?

a. Definitely not
b. Probably not
c. Possibly
d. Probably
e. Definitely

On a scale of 1 to 5, how relevant and helpful was the ACT workshop for you professionally?

Not helpful at all 1 2 3 4 5 Extremely helpful

What is the likelihood that you will continue to use the strategies you learned during the workshop in your clinical practice?

a. Definitely not
b. Probably not
c. Possibly
d. Probably
e. Definitely

What did you like best about the study?
What would you have done differently?
Other general feedback:

Appendix B

Procedural Fidelity Data Sheet

Participant #:_____ Date: _____
The following scale will be used to score the fidelity of the treatment.
+ = The topic was covered during the session
– = The topic was not covered during the session

Session	Description	Topic	Was the topic covered? (+/–)
1	Pre-recorded video	Provide overview of ACT	+/–
		Introduce six core processes	+/–
2	1–2 hours live video conference	Discuss staff obstacles	+/–
		Review six core processes	+/–
		Complete experiential exercises for each core process	+/–
		Complete matrix	+/–
		Development of SMART goals and ACTion plan	+/–
		Assign worksheets and logs	+/–
3	1 hour live video conference	Review assignments	+/–
		Modify goals	+/–
		Discuss ACTion plan	+/–
Total score: $\left[\frac{(Total+)}{(Total+)+(Total-)}\times 100\right]$			_____%

Appendix C

Knowledge Check Data Sheet

Present moment awareness. On a scale of 0 to 2, how accurately can the participant explain this core process?

Not at all 0 1 2 Extremely accurate

Acceptance. On a scale of 0 to 2, how accurately can the participant explain this core process?

Not at all 0 1 2 Extremely accurate

Defusion. On a scale of 0 to 2, how accurately can the participant explain this core process?

Not at all 0 1 2 Extremely accurate

Self-as context. On a scale of 0 to 2, how accurately can the participant explain this core process?

Not at all 0 1 2 Extremely accurate

Values. On a scale of 0 to 2, how accurately can the participant explain this core process?

Not at all 0 1 2 Extremely accurate

Committed action. On a scale of 0 to 2, how accurately can the participant explain this core process?

Not at all 0 1 2 Extremely accurate

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References

Aitken, C. J., & Schloss, J. A. (1994). Occupational stress and burnout amongst staff working with people with an intellectual disability. *Behavioral Interventions*, *9*(4), 225–234. https://doi.org/10.1002/bin.2360090404

Anderson, C. M., Hawkins, R. P., Freeman, K. A., & Scotti, J. R. (2000). Private events: Do they belong in a science of human behavior? *The Behavior Analyst*, *23*(1), 1–10. https://doi.org/10.1007/BF03391995

Bakker, A. B., Demerouti, E., & Sanz-Vergel, A. I. (2014). Burnout and work engagement: The JD–R approach. *Annual Review of Organizational Psychology and Organizational Behavior*, *1*(1), 389–411. https://doi.org/10.1146/annurev-orgpsych-031413-091235

Bond, F. W., Hayes, S. C., & Barnes-Holmes, D. (2006). Psychological flexibility, ACT, and organizational behavior. *Journal of Organizational Behavior Management*, *26*(1–2), 25–54, https://doi.org/10.1300/J075v26n01_02

Bottini, S., Wiseman, K., & Gillis, J. (2020). Burnout in providers serving individuals with ASD: The impact of the workplace. *Research in Developmental Disabilities*, *100*, 103616. https://doi.org/10.1016/j.ridd.2020.103616

Brinkborg, H., Michanek, J., Hesser, H., & Berglund, G. (2011). Acceptance and commitment therapy for the treatment of stress among social workers: A randomized controlled trial. *Behaviour Research and Therapy*, *49*(6–7), 389–398. https://doi.org/10.1016/j.brat.2011.03.009

Cohen, S., Kamarck, T., & Mermelstein, R. (1994). Perceived stress scale. *Measuring Stress: A Guide for Health and Social Scientists*, *10*(2), 1–2. https://www.northottawawellnessfoundation.org/wp-content/uploads/2018/04/PerceivedStressScale.pdf

Corti, C., Pergolizzi, F., Vanzin, L., Cargasacchi, G., Villa, L., Pozzi, M., & Molteni, M. (2018). Acceptance and commitment therapy-oriented parent-training for parents of children with autism. *Journal of Child and Family Studies*, *27*(9), 2887–2900. https://doi.org/10.1007/s10826-018-1123-3

DiGennaro, F. D., Martens, B. K., & Kleinmann, A. E. (2007). A comparison of performance feedback procedures on teachers' treatment implementation integrity and students' inappropriate behavior in special education classrooms. *Journal of Applied Behavior Analysis*, *40*(3), 447–461. https://doi.org/10.1901/jaba.2007.40-447

Flaxman, P. E., Bond, F. W., & Livheim, F. (2013). *The mindful and effective employee: An acceptance and commitment therapy training manual for improving well-being and performance*. New Harbinger Publications.

Fryling, M. J., Wallace, M. D., & Yassine, J. N. (2012). Impact of treatment integrity on intervention effectiveness. *Journal of Applied Behavior Analysis*, *45*(2), 449–453. https://doi.org/10.1901/jaba.2012.45-449

Gould, E. R., Tarbox, J., & Coyne, L. (2018). Evaluating the effects of acceptance and commitment training on the overt behavior of parents of children with autism. *Journal of Contextual Behavioral Science*, *7*, 81–88. https://doi.org/10.1016/j.jcbs.2017.06.003

Harris, R. (2007). *Acceptance and commitment therapy (ACT) introductory workshop handout*. Act Mindfully. http://www.actmindfully.com.au/upimages/2007_Introductory_ACT_Workshop_Handout_-__Russ_Harris.pdf

Hayes, S. C. (2004). Acceptance and commitment therapy, relational frame theory, and the third wave of behavioral and cognitive therapies. *Behavior Therapy*, *35*(4), 639–665. https://doi.org/10.1016/S0005-7894(04)80013-3

Hayes, S. C., Levin, M. E., Plumb-Vilardaga, J., Villatte, J. L., & Pistorello, J. (2013). Acceptance and commitment therapy and contextual behavioral science: Examining the progress of a distinctive model of behavioral and cognitive therapy. *Behavior Therapy*, *44*(2), 180–198. https://doi.org/10.1016/j.beth.2009.08.002

Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behaviour Research and Therapy*, *44*(1), 1–25. https://doi.org/10.1016/j.brat.2005.06.006

Howard, S., & Johnson, B. (2004). Resilient teachers: Resisting stress and burnout. *Social Psychology of Education*, *7*(4), 399–420. https://doi.org/10.1007/s11218-004-0975-0

Hurt, A. A., Grist, C. L., Malesky, L. A., Jr., & McCord, D. M. (2013). Personality traits associated with occupational 'burnout' in ABA therapists. *Journal of Applied Research in Intellectual Disabilities*, *26*(4), 299–308. https://doi.org/10.1111/jar.12043

Kazdin, A. E. (2011). *Single-case research designs: Methods for clinical and applied settings*. Oxford University Press.

Kyriacou, C. (2001). Teacher stress: Directions for future research. *Educational Review*, *53*(1), 27–35. https://doi.org/10.1080/00131910120033628

Lane, K. L., Bocian, K. M., MacMillan, D. L., & Gresham, F. M. (2004). Treatment integrity: An essential—But often forgotten—Component of school-based interventions. *Preventing School Failure: Alternative Education for Children and Youth*, *48*(3), 36–43. https://doi.org/10.3200/PSFL.48.3.36-43

Lawson, D. A., & O'Brien, R. (1994). Behavioral and self-report measures of staff burnout in developmental disabilities. *Journal of Organizational Behavior Management*, *14*(2), 37–54. https://doi.org/10.1300/J075v14n02_04

Lee, E. H. (2012). Review of the psychometric evidence of the perceived stress scale. *Asian Nursing Research*, *6*(4), 121–127. https://doi.org/10.1016/j.anr.2012.08.004

Little, A., Tarbox, J., & Alzaabi, K. (2020). Using acceptance and commitment training to enhance the effectiveness of behavioral skills training. *Journal of Contextual Behavioral Science*, *16*, 9–16. https://doi.org/10.1016/j.jcbs.2020.02.002

Magnacca, C., Thomson, K., & Marcinkiewicz, A. (2021). Acceptance and commitment therapy for caregivers of children with neurodevelopmental disabilities: A

systematic review. *Current Developmental Disorders Reports*, *8*(2), 152–160. https://doi.org/10.1007/s40474-021-00228-y

Maslach, C., Jackson, S. E., Leiter, M. P., Schaufeli, W. B., & Schwab, R. L. (1986). *Maslach Burnout Inventory* (Vol. 21, pp. 3463–3464). Consulting Psychologists Press.

Mind Garden. (2019). *Maslach Burnout Inventory – Human Services Survey (MBI-HSS) – Assessments, tests*. Author. https://www.mindgarden.com/314-mbi-human-services-survey

Moran, D.J., & Ming, S. (2022). The mindful action plan: Using the map to apply acceptance and commitment therapy to productivity and self-compassion for behavior analysts. *Behavior Analysis in Practice*, *15*(1), 330–338. https://doi.org/10.1007/s40617-020-00441-y

Moran, D. J. (2015). Acceptance and commitment training in the workplace. *Current Opinion in Psychology*, *2*, 26–31. https://doi.org/10.1016/j.copsyc.2014.12.031

Pingo, J. C., Dixon, M. R., & Paliliunas, D. (2020). Intervention enhancing effects of acceptance and commitment training on performance feedback for direct support professional work performance, stress, and job satisfaction. *Behavior Analysis in Practice*, *13*(1), 1–10. https://doi.org/10.1007/s40617-019-00333-w

Plantiveau, C., Dounavi, K., & Virués-Ortega, J. (2018). High levels of burnout among early-career Board-Certified Behavior Analysts with low collegial support in the work environment. *European Journal of Behavior Analysis*, *19*(2), 195–207. https://doi.org/10.1080/15021149.2018.1438339

Polk, K. L., Schoendorff, B., Webster, M., & Olaz, F. O. (2016). *The essential guide to the ACT Matrix: A step-by-step approach to using the ACT Matrix model in clinical practice*. New Harbinger Publications.

Rolffs, J. L., Rogge, R. D., & Wilson, K. G. (2018). Disentangling components of flexibility via the hexaflex model: Development and validation of the Multidimensional Psychological Flexibility Inventory (MPFI). *Assessment*, *25*(4), 458–482. https://doi.org/10.1177/1073191116645905

Sanetti, L. M. H., & Kratochwill, T. R. (2007). Treatment integrity in behavioral consultation: Measurement, promotion, and outcomes. *International Journal of Behavioral Consultation and Therapy*, *4*(1), 95. https://doi.org/10.1037/h0100835

Schuler, R. S. (1980). Definition and conceptualization of stress in organizations. *Organizational Behavior and Human Performance*, *25*(2), 184–215. https://doi.org/10.1016/0030-5073(80)90063-X

Stoddard, J. A., & Afari, N. (2014). *The big book of ACT metaphors: A practitioner's guide to experiential exercises and metaphors in acceptance and commitment therapy*. New Harbinger Publications.

Waters, C. S., Frude, N., Flaxman, P. E., & Boyd, J. (2018). Acceptance and Commitment Therapy (ACT) for clinically distressed health care workers: Waitlist-controlled evaluation of an ACT workshop in a routine practice setting. *British Journal of Clinical Psychology*, *57*(1), 82–98. https://doi.org/10.1111/bjc.12155

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