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DOING HARD THINGS IN THE CONTEXT OF VALUES: VALUES INTERVENTION AS  
AN ESTABLISHING OPERATION FOR APPROACH BEHAVIOR IN THE PRESENCE OF  
AVERSIVE STIMULI

A Dissertation  
presented in partial fulfillment of requirements  
for the degree of Doctor of Philosophy  
in the Department of Psychology  
The University of Mississippi

by

EMMIE HEBERT, M.A.

August 2019

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## ABSTRACT

Aversive control is an umbrella term for behavioral contingencies influenced by the removal or avoidance of aversive stimuli. When individuals are engaging in behavior that is under aversive control, the behavior becomes relatively insensitive to changes in the environment outside of trying to escape or avoid the aversive stimulation. Teaching individuals to increase behavioral and psychological flexibility around potentially aversive stimuli is a goal of a therapeutic perspective called Acceptance and Commitment Therapy (ACT). ACT therapists and trainers use values to motivate their clients to engage in meaningful behaviors despite ever-changing, and often aversive, contexts. The aim of the current study is to analyze the effects of a values-related task on behavior in behavioral approach tasks with established aversive stimuli. College students ( $N = 200$ ) completed questionnaires about psychological flexibility and contamination fear and participated in behavioral approach tasks with perceived contaminated stimuli. The data suggests that reported contamination fear is a better predictor of engagement in aversive stimuli than reported psychological flexibility. Additionally, individuals are more likely to engage in aversive stimuli if it is related to a personal value versus for a relatively arbitrary reward (i.e. tickets) or unspecified consequence.

## DEDICATION

This dissertation is dedicated to my partner Maureen Flynn. To Mo: Thank you for your overwhelming love, support, and patience throughout this process. I could not have picked a better partner in this life.

## LIST OF ABBREVIATIONS

AAQ-II	The Acceptance and Action Questionnaire – II
ACT	Acceptance and Commitment Therapy
BAT	Behavioral Approach Task
BATD	Behavioral Activation Treatment for Depression
MPFI	The Multidimensional Psychological Flexibility Inventory
PI	Padua Inventory
VLQ	Valued Living Questionnaire

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## I. INTRODUCTION

In the literature, there are two main ways to describe an aversive stimulus. One way is to describe the emotional reaction to a stimulus labeled “aversive”. For example, Cisler, Reardon, Williams, and Lohr (2007) listed decreased heart rate, increased skin conductance, and feelings of revulsion as “aversive characteristics” of the emotion of disgust. Spiegler and Guevremont (2002) describe an aversive stimulus as one that is “unpleasant, distasteful, or painful” (p. 168). Another way to describe an aversive stimulus is to describe its functional properties. For example, Cooper, Heron, and Heward (2007) state that a stimulus is aversive if, in the presence of this stimulus, the organism escapes it or works to avoid it.

### **Understanding Aversives from a Philosophy of Science Perspective**

**Contextual Behavioral Science.** The majority of behaviorists ascribe to one of two philosophical world views: mechanism or contextualism. The Cooper and colleague’s (2007) definition of aversive stimulation can be interpreted through both lenses.

**Mechanism.** In a mechanistic world view, the scientist’s goal is to determine cause and effect (Hayes, Hayes, & Reese, 1988). Stephen C. Pepper (1942) used the metaphor of a machine to describe the mechanistic view. He describes that mechanists believe the world as being made up of parts that work together to cause action. Mechanists orient their science with a goal of describing these parts and how they work together in order to understand the world. So, in the definition presented above (i.e. Cooper et al., 2007), the mechanist might observe escape or avoidance behavior and focus their study on figuring out what it was that caused the behavior,

and label that thing as aversive. For example, a loud sound of an alarm caused the student to roll over and turn off the alarm clock. Therefore, the sound of the alarm was the aversive stimulus.

***Contextualism.*** The other world view that some behaviorists ascribe to is contextualism. Pepper (1942) uses the metaphor of act-in-context for contextualism. He describes that contextualists view the world as a singular event, only divided into arbitrary parts when it is useful. In other words, behavior and environmental events cannot be analyzed in isolation. Contextualism can take two forms: descriptive and functional (Hayes, 1993). In descriptive contextualism, scientists analyze and appreciate the relationship between an event and its environment. In functional contextualism, this analysis between an event and its environment is used in the prediction and influence of behavior. In other words, descriptive contextualists are interested in describing behavior and contexts while functional contextualists are interested in the prediction and influence of behavior by the manipulation of contexts.

Functional contextualist would describe aversion as a behavior happening within a change in context, not as an object. So, in the alarm example above, the alarm is not part of the analysis if the individual's behavior of rolling over and turning it off does not happen, and vice versa. There is not one without the other. Additionally, when using aversives to influence behavior (i.e. reinforcement or punishment) the event cannot be considered aversive and the analysis cannot be considered reinforcement or punishment without taking the whole context into consideration. In the alarm example, a functional contextualist would say that negative reinforcement occurred because the individual was in a context where there was no alarm, and therefore no possibility to escape the alarm, and was then in a context where there was an alarm sounding and there was a possibility to escape the alarm. This change in context (no alarm to alarm) influenced the behavior and the behavior occurred within this change in context. The context where the alarm

was sounding would be considered the aversive stimulus because the individual worked to produce a transition back to a context with no alarm.

### **Aversives in Early Behavioral Research**

Behavioral researchers have studied aversives and avoidance in human behavior since the early 1900s (Herrnstein, 1969). Many initially used respondent conditioning and the response to aversive stimuli to understand learned fearful responding. The quintessential account is Watson's "Little Albert" experiment (Watson & Rayner, 1920), where he and his colleagues conditioned an infant to fear small white animals by pairing the presence of white animals with loud sounds. The white animals began to elicit the same fear response as the sounds. After conditioning, little Albert avoided animals resembling those used in the fear conditioning.

By mid-twentieth century, behavioral researchers began to appeal to operant conditioning. Fuller (1949) is often cited as the first experiment published that used a purely operant behavior analysis to teach new behavior. Fuller taught an 18-year old man with a profound intellectual disability to raise his hand using sugar-milk as positive reinforcement. This started a movement. Behavioral scientists flooded the literature with applications of operant conditioning principles to decrease unwanted behaviors and increase desired behaviors among individuals with profound disabilities (e.g., Lindsley, Skinner, & Solomon, 1953). It wasn't long before operant research and application began to utilize aversives, especially when behavior change was difficult or the problem behavior was dangerous.

For example, Lovaas and Simmons (1969) used electric shock to reduce self-injurious behavior among children with intellectual disabilities. Even though shock is effective in reducing self-harm, electrical stimulation devices are controversial for human behavior change (Food and

Drug Administration, 2014). However, using other aversives to decrease unwanted behavior remains ubiquitous in contemporary behavioral research and applied settings.

One example of an intervention that uses aversive stimulation to decrease unwanted behavior is aversion therapy. Aversion therapy is a generic term for psychotherapeutic treatments that utilize respondent conditioning to decrease unwanted operant behaviors. Specifically, interventionists pair an unconditioned stimulus that reliably precedes the target behavior with an aversive stimulus (Chance, 2013). Aversion therapies have been successfully used to treat addiction and substance abuse (e.g., Bordnick, Elkins, Orr, Walters, & Thyer, 2004; Childress, McLellan, & O'Brien, 1985), sexually deviant behaviors (e.g. Marshall, Eccles, & Barbaree, 1991), as well as problem behavior such as nail biting (e.g., Vargas & Adesso, 1976) and trichotillomania (e.g. Crawford, 1988).

For example, Foreyt and Kennedy (1971) used aversion therapy to help overweight individuals lose weight. In their study they paired unhealthy foods with noxious odors, predicting that the pairing would cause their participants to avoid unhealthy food. Researchers heated the participants' favorite food and instructed them to smell and think about the food. A noxious odor was then blown into the participants' faces through oxygen masks. The researchers repeated this procedure multiple times. Participants initially lost weight, but after a period of time they began to gain it back. This highlights one of the problems with aversion therapy. While the effects are visible in the short-term, its long-term effects are often not significant without additional treatment.

### **Using Aversive Stimulation in Research**

In the laboratory, researchers examine behavioral responses to aversives and interventions relating to these responses. Unlike a treatment study, these basic protocols require

the participants to engage in the study for a short period of time and often at one time point. Additionally, researchers choose a specific type of aversive stimulus to use in these laboratory studies.

**Cold pressor task.** One example of an aversive stimulus used in laboratory research is the “cold pressor task”. The task requires participants to submerge one of their hands in icy water. This task produces an uncomfortable and painful sensation that is similar to experiences from chronic pain patients (Rainville, Feine, Bushnell, & Duncan, 1992). Hines and Brown (1932) used the task as a way to raise blood pressure in their participants. Prior studies used other types of painful stimulation such as electrical shock, but the blood pressure ratings varied significantly among participants. The use of a cold pressor to a localized area on the body produced a narrower range of physiological reactions across participants.

Zettle and colleagues (2005) used the cold pressor task to study different methods of coping with pain. In this study, the rationale for the cold pressor task was that “pain is generally an unwanted psychological experience that most individuals attempt to avoid or escape from when possible...” (p. 514). In other words, the cold pressor task was functionally aversive.

**Carbon dioxide-enriched air.** Another way to use aversion in research is to produce aversive physiological responses. Unlike the cold-pressor task, the production of certain physiological responses cannot be quickly escaped. For example, Feldner, Zvolensky, Eifert and Spira (2003) compared an acceptance protocol to a suppression protocol for physiological experiences of anxiety. Study participants were asked about their characteristic response to experienced anxiety and divided into groups with either high or low emotional avoidance. During the study, all participants were subjected to 20% carbon dioxide-enriched air. The carbon dioxide made the participants experience symptoms like dizziness, sweaty palms, and heart

racing (i.e. physiological experiences of anxiety). Half of the participants were instructed to notice the anxiety-like experiences while the other half were instructed to try to suppress these experiences. Participants who originally reported high emotional avoidance reported more distress when attempting to suppress their anxiety experiences than those low in emotional avoidance. Additionally, participants who noticed their anxiety-like experiences tolerated the carbon dioxide air for a longer period of time than those who were instructed to engage in suppression.

The physiological changes experienced by the participants after being subjected to the carbon dioxide-enriched air are also characteristic of anxiety disorders, such as panic disorder (Cox, Endler, Swinson, & Norton, 1992). People often attempt to escape or avoid contexts producing such sensations, which by definition, makes both the sensations and contexts functionally aversive.

**Behavioral Avoidance Test.** The behavioral avoidance test (BAT) is a standardized way to present stimuli and measure approach and avoidance behaviors. The first use of a BAT was Lang and Lazovik (1963) where they asked snake-phobic participants to look, approach, and touch a snake. Though specific instructions and preparation of BATs vary depending on the purpose of the research, all BATs follow a similar process. Participants are first introduced to a stimulus and asked to approach and engage with the stimulus. For example, Steketee, Chambless, Tran, Worden, and Gillis (1996) used BATs for individuals diagnosed with obsessive-compulsive disorder (OCD). In their study, they used ideographic stimuli and step intervals after meeting with participants for two sessions. In their published article, Steketee and colleagues presented examples of BATs used in the study. One example was a seven-step BAT related to numbers. The first step was to think of a number the patients with OCD avoided. A

middle step was to say the number, and the last step was to say a name associated with the number. In this study, a composite BAT score was calculated using the percentage of steps attempted, a score of distress, avoidance (no avoidance, some avoidance, complete avoidance), and the presence of rituals. The results indicate that results of BATs are a good assessment of OCD avoidance behaviors.

***Feared Objects.*** Aversive stimulation is frequently associated with phobia and the emotion of fear (e.g., Lang & Lazovik, 1963). Phobic individuals avoid not only the feared stimuli, but also things related to those stimuli (Dymond, Dunsmoor, Vervliet, Roche, & Hermans, 2015). For example, a snake phobic may avoid snakes at all costs, including living in places with fewer snakes.

In some phobia intervention research, researchers present participants with a feared stimulus and then measure their avoidance behaviors using BATs. For example, Muris, Merckelbach, Holdrinet, and Sijnsenaar (1998) used BATs with spider stimuli with spider-phobic children. The researchers found that the children in an in-vivo exposure condition approached a live spider more so than children in an eye-movement desensitization and reprocessing condition. Andersson et al. (2013) compared a one-session exposure treatment to an Internet-delivered self-help treatment in snake-phobic individuals using BATs with snake stimuli. These researchers found that the individuals in the one-session exposure treatment condition approached a live snake more than individuals in an Internet-delivered self-help condition. Both of these studies not only demonstrated approach behaviors using BATs, but also the aversive properties of the feared stimuli (i.e. avoidance behaviors).

***Contaminated objects.*** Individuals with contamination-related anxiety have traits and behaviors similar to those of a phobia. Both groups of individuals avoid the anxiety-provoking



stimuli and related stimuli (Steketee, Grayson, & Foa, 1985). Steketee and colleagues (1985) point out that the difference lies in the future-oriented fear with contamination anxiety that is not present in specific phobia. Rachman (2004) described this fear as “intense and persisting feelings of having been polluted or infected or endangered as a result of contact, direct or indirect, with a person/place/object that is perceived to be soiled, impure, infectious, or harmful” (p. 1229). In contamination-related anxiety research, BATs are used to present stimuli that a participant with contamination-related anxiety would avoid.

Deacon and Olatunji (2007) found that disgust sensitivity, or a proneness to feeling disgust, is associated with avoidant responding in contamination BATs. These researchers used a used comb, a cookie on the floor, and a bedpan filled with toilet water in their BATs. Results of this study indicated that the participants’ contamination cognitions were related to the BAT behaviors. Specifically, participants that overestimated the severity of contamination were more likely to avoid the stimuli in the BATs.

### **Engaging with Aversive Stimuli**

Individuals might engage in approach behavior in aversive contexts. One reason for this may be that avoiding or escaping from the stimulus is more aversive than the stimulus itself. Another reason for engaging with aversive stimuli may be that there’s something reinforcing in the engagement that is more potent than the aversive. In other words, the engagement serves a purpose that matters to the individual.

**Aversive Control.** Aversive control is an umbrella term for behavioral contingencies influenced by the removal or avoidance of aversive stimuli (Cooper et al., 2007). Behaviors under aversive control are often quite rigid (Wilson, Sandoz, & Kellum, 2009). In other words, when individuals engage in behavior that is under aversive control, the behavior becomes

relatively insensitive to changes in the environment apart from the escape contingency. For example, a school custodian might clean up after a kid that urinated on himself because it his part of his job. If he avoids cleaning up, he may face consequences such as reprimand from his boss, a mark on his job record, or potential job termination. Even though the custodian might typically find urine aversive and avoid it in other situations, the behavior of approaching it in this context is under aversive control. The custodian is behaving to avoid termination or reprimand. While engaging in the task, the custodian may be unaware of how he is impacting the children around him or miss the look of appreciation on the teacher's face.

**Appetitive Control.** In addition to generating inflexible behavioral patterns, aversive control can also produce hostility and aggression (Hutchinson, 1977). An alternative option is to evoke behavior using appetitive stimuli. Appetitive stimuli, which sometimes function as positive reinforcers, often produce the opposite effect of aversive stimuli. Behaviors that result in an appetitive consequence are generally more likely to occur (Catania, 2013). Brady and Emurian (1978) and Emurian, Emurian, and Brady (1982) found that when tasks resulted in monetary earnings, participants performed better and were less likely to complain than in conditions when tasks prevented a reduction in earnings. In other words, the participants performed better on tasks that were under appetitive control conditions versus aversive control conditions.

As another example, going back to the school custodian in the situation above. His behavior might be under appetitive control if he notices that the soiled child is distressed and he cleans up after the child in an attempt to show the child compassion. Even though the custodian might typically find urine aversive and avoid it in other situations, the behavior of approaching it

in this context is under appetitive control, especially if caring for children is something he values.

### **Psychological Flexibility**

Teaching individuals to increase psychological flexibility in the presence of aversive stimuli is the goal of a functional contextual therapeutic model called Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 2012). Psychological flexibility is the engagement in meaningful behaviors despite ever-changing, and often aversive, contexts. Increasing psychological flexibility through ACT has proven beneficial for individuals with a wide range of psychological difficulties (see A-Tjak et al., 2014 for a meta-analysis of the efficacy of ACT).

### **Values**

Within the ACT community, Wilson and DuFrene (2009) defined values from a behavior analytic perspective. The definition states that values are “freely chosen, verbally constructed consequences of ongoing, dynamic, evolving patterns of activity, which establish predominant reinforcers for that activity that are intrinsic in engagement in the valued behavioral pattern itself.” Functionally, values serve as verbal establishing stimuli, which in turn, can alter the function of other stimuli or events (Plumb, Stewart, Dahl, & Lundgren, 2009).

**Verbal establishing stimulation.** Establishing operations alter the reinforcing value of a consequence (Michael, 1982). For example, depriving a rat of food for some time may increase the appetitive value of food for that rat. Conversely, after the rat eats a lot of food, it may be less likely to eat an otherwise appealing treat.

Establishing operations are effective for both human and non-human animals. However, verbally-fluent humans behave in ways unseen in non-verbal humans and non-human animals

(e.g., Devany, Hayes, & Nelson, 1986; Hayes, Barnes-Holmes, & Roche, 2001). Through verbal behavior, humans can transform the functional properties of a stimulus. A stimulus can change from appetitive to more appetitive, neutral, or aversive, from aversive to more aversive, neutral, or appetitive, and from neutral to appetitive or aversive. Verbally associating two stimuli without directly and physically pairing the two stimuli can result in this transformation of stimulus function. In other words, language can be used to create appetitive or aversive stimuli without direct training. This type of behavior is known as augmenting (Hayes, Zettle, & Rosenfarb, 1989) and the change in context is a verbal establishing stimulus (Hayes et al., 2001). If someone was in a flower shop, an example of an augmental would be, “Those flowers sure smell wonderful.” The flowers were available before the verbal rule of “smell wonderful” was established, but this rule might increase the probability of someone smelling the flowers or buying flowers.

*Values as augmentals.* As posited by Hayes and colleagues (2012), “augmenting is rule-governed behavior that alters the extent to which some event will function as a consequence” (p. 54). Ju and Hayes (2008) demonstrated verbal establishing stimulation (i.e., augmenting) in both children and college students. They trained verbal stimuli, such as familiar names (e.g. “food” and “stickers”) and arbitrary words, to be associated with specific reinforcing stimuli (e.g. food or stickers). They found that after training, the target behavior (approaching a box) increased after being presented with the verbal stimuli, even when the stimuli were nonsense, arbitrary, neutral words that had been associated to the familiar names. Two aspects of this study are worth noting: 1) all reinforcing stimuli were available throughout the experiment and 2) on some trials the participants were not presented with any verbal stimuli. The results highlight that behavior that was associated with verbal stimuli was more likely to occur in the presence of the

verbal stimuli than in the absence of the verbal stimuli, even though the reinforcing stimuli were available. These words transformed the function of the behavior that produced reinforcing consequences from appetitive to more appetitive (i.e., more likely to happen than when nothing is said).

Plumb and colleagues (2009) claim that values function as augmentals in the same way as the verbal stimuli presented in the Ju and Hayes (2008) experiment. As a demonstration, if we go back to the example of the custodian mentioned above, if we have identified that the care of children is one of the custodian's values. Any behavior that the custodian associates with his value of "caring for children" establishes the opportunity to engage in that behavior as reinforcing. So, the custodian might do things that he would typically avoid, like clean up urine, because it follows the verbal rule of his value of caring about children. This rule ("I value caring for children") transformed the function of the behavior of cleaning up urine from aversive to appetitive. Additionally, because the behavior has appetitive functions and is under appetitive control, the custodian's behavior and awareness is likely open to more than just escaping the potentially aversive stimulation (i.e. reprimands). The custodian might be more likely to notice that the child is embarrassed for his accident and the teacher is thankful for the custodian's work. Though this claim of values as augmentals has not been directly empirically demonstrated, the benefit of having a values component in a behavior-change intervention has.

**Intrinsic in engagement.** Wilson and DuFrene (2009)'s definition of values includes that values are "intrinsic in engagement in the valued behavioral pattern itself". This is not to be confused with the social psychological concept of intrinsic motivation. According to the social psychological Self-Determination Theory (Deci & Ryan, 1985), intrinsic motivation occurs when an individual engages in a behavior because engaging that behavior is inherently satisfying,

whereas extrinsic motivation occurs when an individual engages in a behavior because it leads to a specific desirable outcome (Ryan & Deci, 2000). In other words, if an activity is completed because the person likes it and does not receive a specific reward or consequence after it, that activity is intrinsically motivating for that individual. The intrinsic versus extrinsic distinction in social psychology is parallel to a distinction of within the individual versus outside of the individual.

In the ACT definition of values, Wilson and DuFrene (2009) are **not** positing that values-based behaviors are reinforcing because the person “likes” to do them or that they are “satisfying”. They **are** positing that the reinforcing properties of values lie within the engagement of an activity matching a verbally constructed value. As presented above, a functional contextual analysis of behavior is not complete without taking the context into account. In values-based action, the individual’s behavior is in line (i.e. matching or coherent) with the verbally constructed values. It is this coherence between behavior and verbal values that is reinforcing values-based action.

*Matching as reinforcing.* Matching patterns is an evolutionary necessity in all organism. Being able to recognize patterns as safe versus dangerous increases an organism’s chance of survival (Mattson, 2014). For example, coral snakes and king snakes have similar patterns of red, black, and yellow striped bands. However, a king snakes have red bands touching black bands and coral snakes have red bands touching yellow bands. Distinguishing these patterns are important because a coral snake is venomous while a king snake is not. Organisms who have learned this pattern have lived on to reproduce and have offspring that have a higher probability of also pattern matching.

Social and cognitive psychologists refer directly to consistency between behavior and beliefs in the theory of cognitive dissonance. In Leon Festinger's book *A Theory of Cognitive Dissonance* (1957), the first sentence of chapter one reads, "It has frequently been implied, and sometimes even pointed out, that the individual strives toward consistency within himself." Festinger states that cognitive dissonance occurs when an individual holds a specific belief and then behaves in opposition to that belief. One example he gives is if someone believes that children should be quiet but yet provokes children to become rambunctious. Festinger also states that humans have a tendency to reduce the cognitive dissonance by either changing behavior or beliefs because the inconsistency is uncomfortable.

Functional contextualists posit that humans learn language through a history of reinforcement for matching and relating verbal stimuli (Hayes et al., 2012). Bordieri, Kellum, Wilson, and Whiteman (2015) conducted a study where participants were presented with matching-to-sample tasks. After the matching-to-sample training, participants were given the choice to engage in matching-to-sample trials that were consistent with previous training or engage in matching-to-sample trials that were inconsistent with previous training. Participants displayed a significant preference for engaging in behavior that matched their learning history of the stimuli.

The presence of literature about the reinforcing nature of matching across disciplines strengthens the claim that coherence in itself can serve as a reinforcer for human behavior. This is consistent with the part of Wilson and DuFrene's definition of values which states that the reinforcers in values are intrinsic in the valued activity. An individual engaging in valued activity moves from a context where there was little-to-no coherence between verbally-constructed

values and behavior to a context where there is coherence between values and behavior, which in-itself is reinforcing.

### **Addressing Values in Therapy**

**Pleasant Event Schedule.** An early hint of values in psychotherapy is Pleasant Events Schedule (PES) by MacPhillamy and Lewinsohn (1982). The inventory includes a list of 320 activities that a client can rate how often they have engaged in each activity in the past month and how enjoyable they found each activity when engaging in it. Clinicians use this list to address the frequency and subjective enjoyment of positive events in their clients' lives.

While pleasant events were a step in the right direction, they do not serve the same long-term function as values in therapy. The events may be related to values (e.g., eating dinner with friends is related to the value of being a good friend), but it is not explicitly stated in the protocol, nor has it been studied in this regard. Behavioral Activation Treatment for Depression combines these approaches by increasing the frequency of the behaviors related to a client's goals and values (BATD; Lejuez, Hopko, & Hopko, 2001).

**Behavioral Activation Treatment for Depression.** Clinicians using Behavioral Activation Treatment for Depression (BATD; Lejuez et al., 2001) use a values-driven framework to increase the frequency of valued activities amongst individuals with depression. In BATD, clinicians work with clients to identify values using a values assessment protocol (adapted from Hayes, Strosahl, & Wilson, 1999). The clinician and client then develop goals that the client can work towards that are consistent with specific values (Lejuez et al., 2001). A structured schedule of activities may be set that the client can follow and report on in sessions.

**Acceptance and Commitment Therapy.** Values-driven action is the primary goal of ACT (Hayes et al., 2012) as opposed to reduction of symptoms such as anxious worry or



negative thinking (Wilson & Murrell, 2004). This is accomplished through promoting psychological flexibility. Consider a client presenting with recurrent worries that his friends do not like him. A symptom-reduction oriented therapist might lead the client through exercises designed to reduce the frequency and intensity of those worries, such as cognitive restructuring (Beck, 2011). In contrast, an ACT therapist would target behaviors that would have the client engage in behaviors that relate to the things he cares about (i.e., going to a party with friends), without directly challenging or attempting to directly change these thoughts or the feelings associated with social engagement.

ACT clinicians promote values-driven action in a number of ways. Using the Bull's Eye worksheet, the therapist and client focus on four valued domains: work/education, leisure, relationships, and personal growth/health (Lundgren et al., 2012). Clients first identify their values in those four areas. Clients receive an image of a bull's eye split into four quadrants representing these four domains. The center of the bull's eye is labeled "My life is just as I want it to be". The edge of the image is labeled "My life is far from how I want to be". Clients are asked to make a mark on the image between the center and the edge that represents the degree to which the client is living just as they want. The worksheet can then be used to guide further discussion of the client's values and of behavioral activation that might serve those values.

Hayes and Coyne (2010) developed a card system to encourage younger clients to identify their values. Their Values Cards include images and simple phrases that youth can see and understand. For example, the "Forgiving" Values Card has a picture of a two people hugging. The images are bright and eye-catching, but also ambiguous enough to occasion a variety of interpretations and open-ended conversations that can lead to behavioral goals and targets. These cards can be used in individual or group therapy.

Another way to make values salient for therapy clients is through values-based experiential exercises. A prime example of this is the Sweet Spot meditation (Wilson & Sandoz, 2008). In this exercise, the therapist asks the client to bring to mind a sweet moment in their life. The therapist asks them to notice small details of the sweet moment, such as colors, temperature, and smells. They ask their clients to notice any thoughts or feelings that were present in that moment of sweetness. After the exercise is complete, the debrief might entail working with clients to connect their sweet moments to salient values, values they would like to develop, and behaviors they might engage in to serve those values.

### **Values in the Experimental/Research Setting**

Although such values work is ongoing in several clinical approaches such as ACT and BATD, these interventions are complex, making experimental analysis difficult. As with many aspects of behavioral treatment, experimental analogues can form an empirical and conceptual bridge between clinical intervention and well-controlled laboratory research. In other words, experimental research in the lab can provide a foundation for improving or developing new clinical interventions.

Values intervention research includes several different methods to get participants thinking about their values. One method is interviewing. For example, Páez-Blarrina and colleagues (2008) conducted a pain task that measured the effects of an ACT acceptance and values protocol, a pain control-values protocol, and a no-values protocol. In the ACT protocol, the participants were told to think about going through the pain as a part of doing something important. Specifically, they were told that the study would be used to help those that experience pain every day while trying to engage in things they care about. In the pain control-values protocol, the participants were also told to think about going through the pain as doing something

important, but they were also told that individuals with pain often have to give up doing important things because of the pain. These participants were told that the study would be used to help those that experience pain every day and have to give up doing things that they care about. For the pain task, the participants received continuous electric shocks to their forearm while engaging in a match-to-sample procedure. Participants in the ACT acceptance and values group showed significantly more tolerance for pain than those in the other two groups, as evidenced by continuing the pain task even after a “very much pain” rating.

Writing about values can produce benefits. Values writing has been shown to improve academic performance (Cohen, Garcia, Apfel, & Master, 2006; Miyake et al., 2010), willingness to engage in social connection with others among smokers, (Crocker, Niiya, & Mischkowski, 2008), and greater feelings of love, connectedness, empathy, and giving (Crocker et al., 2008).

The most common method of identifying values in research are through questionnaires that have the participants choose from a list of common values. These studies include questionnaires such as the Valued Living Questionnaire (VLQ; Wilson, Sandoz, Kitchens, & Roberts, 2010), the Values Questionnaire (Allport, Vernon, & Lindzey, 1960), Portrait Values Questionnaire (PVQ; Schwartz, Melech, Lehmann, Burgess, & Harris, 2001) and the Personal Values Questionnaire-II (PVQ-II; Ciarrochi & Blackledge, 2006). For example, Creswell and colleagues (2005) used the Values Questionnaire which defines five personal values (religion, social issues, politics, theory, and aesthetics). Participants were asked to rate how important their chosen values were and rank these values in order (highest priority value to lowest priority value) according to their personal preference. After ranking, participants were split into two groups. One group answered multiple-choice questions about their top-ranked value, and the other answered multiple-choice questions about their fifth-ranked value. The participants then

engaged in stress tasks (i.e. giving a speech and mental arithmetic). The top-ranked value group showed lower cortisol levels after the stress tasks than the fifth-ranked value group.

### **Values as a Stand-Alone Component**

As in the above-mentioned studies, research with values in ACT has always included other components of ACT rather than values in isolation. Branstetter-Rost, Cushing, and Douleh (2009) conducted a study that might be considered the *closest* to examining values as an isolated component of the ACT model. In their study, they looked at pain tolerance during a cold pressor task in three groups of participants: a group receiving an acceptance intervention, a group receiving an acceptance intervention with a values component, and a control condition. The participants in the acceptance intervention with a values component demonstrated significantly greater pain tolerance than the acceptance intervention alone. Both groups demonstrated greater pain tolerance than the control group. Though a values intervention was not completely isolated, the study designed allowed the researchers to compare what the values part of the intervention added to the outcome of the study above and beyond an isolated acceptance intervention.

### **The Current Study**

While Branstetter-Rost and colleagues (2009) made a first step towards establishing the effects of values on behavior, their study did not demonstrate the effects of a values intervention independent of acceptance training. ACT researchers and clinicians make the claim that values establish the conditions for behavior change when the environment is typically or potentially aversive, but it is unclear if just a values intervention alone is enough. The aim of this study is to demonstrate the effects of a values-related intervention on behavior in behavioral approach tasks (BATs) with established aversive stimuli.

For this study, contaminated stimuli were used to serve as the potentially aversive objects in the BATs. The specific BATs in this study have been used in numerous studies of disgust and contamination (e.g. Deacon & Olatunji (2007); Deacon & Maack (2008)).

Additionally, we wanted to parse out approach behavior due to a relatively arbitrary or low-value consequence versus approach behavior due to a value-related consequence. To help to examine these differences three conditions were utilized. In one condition there was no consequence delivered contingent on approach in the BAT. In another condition tickets were delivered contingent on approach, where more approach produced more tickets. In the last condition, participants received the tickets, but were also told that each ticket would be placed in a drawing for a donation to a charity of their choice.

### **Hypotheses**

1. Psychological flexibility will predict baseline approach behavior above and beyond contamination fear for all participants. Specifically, participants high in psychological flexibility or low in psychological inflexibility will engage in more approach behaviors than those low in psychological flexibility or high in psychological inflexibility.
2. The difference in approach behavior from baseline BATs to the second round of BATs will be greater for the participants in the Values + Tickets condition than the Ticket or Control condition. Additionally, the difference in approach behavior from baseline BATs to the second round of BATs will be greater for the participants in the Tickets-Only condition than the Control condition.
3. The relationship between psychological flexibility and the difference in BAT scores will be moderated by the condition the participants are in. Specifically, because of the values component in the Values + Tickets condition, there will be a stronger relationship

between measures of psychological flexibility and BAT difference scores in the Values + Tickets condition than in the Ticket or Control conditions, which do not include a component of psychological flexibility.

## II. METHODOLOGY

### Participants

245 participants volunteered to participate in psychology research in return for course credit. An *a priori* power analysis using G Power (Faul, Erdfelder, Lang, & Buchner, 2007) indicated that for the analyses required, a sample size of 165 (55 in each condition) is needed to detect a small to moderate-sized effect ( $f^2 = .09$ ) with a power of 0.85 and alpha of .05. Due to experimenter error, specific demographics of the sample were not collected. However, the participant recruitment program stores participant information for one semester. Because of this, aggregate demographics for the last 156 participants were obtained from the university registrar. Of these 156 participants, 69.8% were females, 68.5% were Caucasian, 18.5% were African-American, 0.6% were Hispanic or Latino, and 0.6% were Asian or Other identified ethnicity. Of these participants, the ages ranged from 18-43 years ( $M = 19.29$ ).

### Measures

**Padua Inventory Contamination Fear Subscale.** The Padua Inventory – Washington State University Revision (PI; Burns, Keortge, Formea, & Sternberger, 1996) contains a subscale measuring contamination fear. This subscale consists of 10 items that measures an individual's fear of contamination and washing behaviors (e.g., “I feel my hands are dirty when I touch money”, “I wash my hands more often and longer than necessary”). The items are scored on a 5-point Likert-type rating scale ranging from 0 (*Not at all*) to 4 (*Very much*). The total score is equal to the sum of all 10 items. The contamination fear subscale of the PI has high internal consistency ( $\alpha = 0.85$ ; Burns et al., 1996), high convergent validity (Burns et al., 1996; Deacon

& Olatunji, 2007; Thordarson et al., 2004), and good test-retest reliability (0.72; Burns et al., 1996).

**Acceptance and Action Questionnaire.** The Acceptance and Action Questionnaire - II (AAQ-II; Bond et al., 2011) is a 7-item questionnaire designed to measure overall psychological flexibility. The AAQ-II is an improved version of the earlier AAQ (Hayes et al., 2004). Items include statements such as “I worry about not being able to control my worries and feelings” and are rated on a scale from 1 (*never true*) to 7 (*always true*). The AAQ-II is correlated with previous versions of the measure ( $r = .82$ ), demonstrated acceptable internal consistency ( $\alpha = .84$  [mean across six samples]), and test-retest reliability (3-month: .81; 12-month: .79) (Bond et al., 2011). The AAQ-II was included in the methods of this study due to the relative novelty of the Multidimensional Psychological Flexibility Inventory (MPFI). In the study, however, the MPFI will be the primary measures of psychological flexibility and inflexibility.

**Multidimensional Psychological Flexibility Inventory.** The Multidimensional Psychological Flexibility Inventory (MPFI; Rolffs, Rogge, & Wilson, 2018) is a 60-item measure of the 12 dimensions of the psychological flexibility model. The 12 dimensions consist of 6 dimensions of psychological flexibility (acceptance, defusion, present moment awareness, self-as-context, values, and committed action) and 6 dimensions of psychological inflexibility (experiential avoidance, fusion, lack of contact with the present moment, self-as-content, lack of contact with values, and inaction). Each dimension is represented with 5 items. All items are rated on a 6-point Likert-type scale (*never true* to *always true*). The MPFI has good internal consistency ( $\alpha$  ranges from .959 to .971 within a range of demographic subgroups) and has shown strong correlations with popular measures of psychological flexibility.



**Bogus Items.** To assess for careless responding, two “bogus” items were inserted into the questionnaire series. These items read, “If you are reading this, select "A little",” and, “If you are reading this, choose "Rarely True".” As suggested by Meade and Craig (2012), each item was placed after about every fifty questionnaire items.

**Behavioral Approach Tasks (BATs).** The participants engaged in three BATs, using similar methodology and stimuli from Deacon and Olatunji (2007) and Deacon and Maack (2008). Each BAT task consisted of three steps designed to increase in level of exposure at each step. One stimulus was a used comb. The steps for this stimulus included touching the comb with a finger, holding the comb in their hand, and, lastly, running the comb through their hair. Another stimulus was a cookie dropped on the floor. The floor where the cookie was dropped was sanitized before the participant’s arrival. The steps for this stimulus included holding the cookie, touching the cookie to their lips, and taking a bite of the cookie. A third stimulus was a bedpan filled with “urine”. The “urine” was actually apple juice. The steps for this stimulus included putting on a protective glove and touching the side of the bedpan, submerging hand in the liquid with a glove on, and completely submerging hand in the liquid without a glove on. The participants were asked if they were willing to complete each step. Willingness and the completion each task was recorded. Additionally, after each step the participant was asked to rate their distress and feelings of contamination on a scale from 1 to 10. All steps were presented, even if the participant was willing to interact with the stimuli.

## **Procedures**

Participants were recruited using an online research management program. In order to examine the impact of the values task, the participants were randomized into three conditions: Values + Tickets, Tickets-Only, or Control.

As potential participants arrived at the scheduled time and place of the study, they received a consent form. A research assistant described the basic research procedures, incentives, right to withdraw, risks, and the guarantee of anonymity. After written consent, the participant was led to a room where the first step of the study took place. In the room was a desk with a computer on one side and a table with the materials needed for the study on the other side.

The research assistant led participants to a computer to complete measures of psychological flexibility (AAQ-II and MPFI) and the Padua Inventory on a computer using Qualtrics, an online survey program. The measures were presented in a random order. After completing measures, participants were asked to engage in three Behavioral Avoidance Tasks (BATs; see above for descriptions) where they were directly observed to perform or not perform the presented task. After each task, participants rated contamination and distress on a scale of 0 to 10 (0 being not contaminated and 10 extremely contaminated, and 0 being not distressed and 10 being extremely distressed). When all BATs were completed, the participants were offered hand sanitizer. Following the BATs, the participants either began a values writing task or were instructed to wait while the research assistant set up the next part of the study, depending on condition assignment. Participants were assigned to a condition based on the order in which they participated in the study (i.e. first participant was in the Control condition, second participant was in the Tickets-Only condition, third participant was in the Values + Tickets condition, and this pattern of condition assignment was repeated).

**Values + Tickets Condition.** Participants in the Values + Tickets condition were led to an adjacent quiet room and instructed to identify a charity that they care about and why this charity is meaningful to them. The instructions were presented verbally and printed on a paper. The instructions also included a list of common charities and the participant was told they could

pick from the list or request their own charity. The charity could be a big charity or a local charity of their choosing. The participant was then given a pen and told to write about their chosen charity and why it is meaningful to them until instructed to stop (after 5 minutes).

The participant was then led back to the room with the BATs to complete the BATs again. They were informed that this time they were earning tickets to be put in a drawing for a donation to the charity that they just wrote about. They could earn one ticket for engaging in each step of the task. They could earn an additional two tickets if they engage in all presented steps. The participant was told the amount of tickets they have earned at the end of the BATs. If the participant did not engage in any steps, they still earned one ticket entered into the drawing for participating. After the BATs, the research assistant wrote down the participant's name, email address, and selected charity.

**Tickets-Only Condition.** Participants in the Tickets-Only condition were told to wait in an adjacent quiet room while the research assistant set up the next task. The research assistant reset the BATs and waited six minutes before bringing the participant back to the room with the BATs to begin BAT tasks.

The participant then completed the BATs a second time. The research assistant told the participant that this time they were earning tickets for engaging in the tasks. They could earn one ticket for engaging in each step of the task. They could earn an additional two tickets if they engage in all presented steps. If the participant asked what the tickets were for, the research assistant responded with, "They are just tickets." After the BATs, the research assistant told the participant how many tickets they won. Then, they told the participant that these tickets would be entered into a drawing to win money for a charity of their choosing. If the participant did not engage in any steps, they still had one ticket entered into the drawing for participating. The

research assistant presented the participant with a list of common charities and told the participant they could pick from the list or request their own charity. The charity could be a big charity or a local charity of their choosing. The research assistant recorded the participant's name, email address, and chosen charity.

**Control Condition.** Participants in the Control group were told to wait in an adjacent quiet room while the research assistant sets up for the next task. The research assistant reset the BATs and waited six minutes before bringing the participant back to the room with the BATs to begin BAT tasks.

The participant then completed the BATs again. After all the BATs, the research assistant told the participant that they have earned a ticket for each step they engaged in during the last set of BATs. If they engaged in all steps, they earned an extra two tickets. The research assistant then told the participant how many tickets they won and that these tickets would be entered into a drawing to win money for a charity of their choosing. If the participant did not engage in any steps, they still had one ticket entered into the drawing for participating. The research assistant presented the participant with a list of common charities and told the participant they could pick from the list or request their own charity. The charity could be a big charity or a local charity of their choosing. The research assistant recorded the participant's name, email address, and chosen charity.

**Study Conclusion.** At the end of the study, all participants were debriefed. Debriefing included providing the participant with information about the BATs such that the "urine" was actually apple juice and the floor was sanitized before the cookie made contact with it. The participants were also told that if their charity was one that is listed as a hate group by the

Southern Poverty Law Center, their charity would be excluded the drawing. They were then thanked for their participation and dismissed.

A drawing was conducted at the end of data collection. Two charities were chosen to each receive \$200. The participants who identified the chosen charities were notified and thanked again for their participation.

### **Statistical Analyses**

The statistical package SPSS was used to perform all statistical analyses. Normality of variables was tested using the Shapiro-Wilk test, skew, and kurtosis. Outliers were assessed for univariate tests using z-scores ( $|z| > 3$ ). Participants who responded with the same response for all items of more than one questionnaire were excluded from analyses, under the assumption of careless responding (i.e. 1,1,1,1,1...; see Meade & Craig, 2012). Descriptive statistics for and correlations among the constructs of interest are presented in Table 1.

Correlations analyses were run on all variables to assess any relationships that may exist. Additionally, hierarchical regressions were conducted to examine predictive value of contamination fear and psychological flexibility on the baseline BATs.

**Primary Analyses.** For our main analyses, an ANCOVA was conducted to assess between group differences on the difference in the number of steps approached in the BATs from baseline to the second round of BATs (second BATs minus baseline BATs). For these analyses, contamination fear as measured by the PI was used as a covariate. If psychological flexibility would have significantly predicted performance in the baseline set of BATs beyond contamination fear, scores on the MPFI would have also been used as a covariate. However, this was not the case (see Results below).

**Secondary Analysis.** To test the secondary hypothesis, the Process for SPSS package

(Hayes, 2015) was used to run a moderation analysis to examine if condition (Values, Tickets, Control) moderates the relationship between psychological flexibility and differences in approach behavior for the two sets of BATs (BAT2-BAT1).

### III. RESULTS

#### Removed Participants and Final Sample

Of the 245 individuals participating in the study, participants that reported knowing that the bedpan task was a deceptive task ( $n = 30$ ) were removed from the analyses. Next, survey data was examined for participants that responded with the same response for more than one questionnaire. This was conducted by looking for variances that equal 0 for a questionnaire. None of the participants met this criterion so none were excluded at this point. Seven participants were excluded for incorrectly answering both of the bogus items planted in the questionnaires. Next, single measure outliers were assessed for using z-scores ( $|z| > 3$ ) and data from six participants were removed according to this criterion. This left a total of 200 participants in the final sample. Of this sample, 68 were in the Control condition, 64 were in the Tickets-Only condition, and 68 were in the Values + Tickets condition.

Of the 200 participants, only one participant did not approach any stimuli and it was only in the first round of BATs. Most participants approached stimuli between three to seven times out of the nine total opportunities for both rounds of BATs (Table 1, Appendix).

**Hypothesis 1:** *Psychological flexibility will predict baseline approach behavior above and beyond contamination fear. Specifically, participants high in psychological flexibility or low in psychological inflexibility will engage in more approach behaviors than those low in psychological flexibility or high in psychological inflexibility.*

Approach behaviors for the BATs were calculated by adding the number of steps completed for each of the three BAT tasks. All of participants that stated they were willing to

complete a step actually completed the step (i.e. there were no participants that responded affirmative for willingness and then did not perform the approach behavior). For each of the two rounds of BATs, the minimum number of steps possible was 0 and the maximum number of steps possible was 9. Descriptive statistics and bivariate correlations were conducted for approach behaviors in baseline BATs, measures of psychological flexibility and inflexibility, and contamination fear (Table 2).

There was a significant negative relationship between approach behavior in baseline BATs and contamination fear ( $r = -.282, p = .000$ ). Additionally, contrary to our prediction in our first hypothesis, there was no significant relationship between the approach behavior in the baseline BATs and psychological flexibility ( $r = .113, p = .112$ ) or inflexibility ( $r = -.030, p = .672$ ). There was a significant inverse relationship between psychological flexibility and psychological inflexibility ( $r = -.176, p = .013$ ) and while psychological inflexibility was positively related to contamination fear ( $r = -.256, p = .000$ ), psychological flexibility was not found to be related to contamination fear ( $r = .023, p = .749$ ). Psychological inflexibility as measured by the AAQ-II was also added to the analysis. The AAQ-II measure was significantly related to psychological inflexibility as measured by the MPFI ( $r = .673, p = .000$ ), with a high covariance. All statistics were run with both variables, with no differences in outcome.

Therefore, only psychological inflexibility as measured by the MPFI will be presented hereafter.

Table 2. Correlations Between Individual Difference Variables

	<i>M</i>	<i>SD</i>	(2)	(3)	(4)	(5)
(1) BAT1	4.15	1.77	.113	-.030	-.082	-.282**
(2) Flex	3.97	.76	-	-.176*	-.299**	.023
(3) Inflex	2.59	.74		-	.673**	.256**
(4) AAQ-II	17.94	8.08			-	.198**
(5) PI_Con	9.63	6.74				-



Note: \* $p < .05$ , \*\* $p < .01$ ; BAT1 = Baseline BATs, Flex = MPFI Psychological Flexibility Scale, Inflex = MPFI Psychological Inflexibility Scale, AAQ-II = AAQ-II Psychological Inflexibility, PI\_Con = Padua Inventory Contamination Fear Scale

Because there was not a significant relationship between approach scores in the baseline BATs and psychological flexibility and inflexibility, psychological flexibility and inflexibility would not be good predictors of BAT approach behavior, and especially not a better predictor than contamination fear. When added to a hierarchical regression model where contamination fear is predicting baseline BAT approach behaviors ( $R^2 = .079$ ), the  $R^2$  change was only .014 for psychological flexibility and .002 for psychological inflexibility.

**Hypothesis 2:** *The difference in approach behavior from baseline to the second set of BATs will be greater for the participants in the Values + Tickets condition than the Tickets-Only condition or Control condition. Additionally, participants in the difference in approach behavior from baseline to the second set of BATs will be greater for the participants Tickets-Only condition than the Control Condition.*

Descriptive statistics for approach scores for the baseline BAT and all of the questionnaires (psychological flexibility, psychological inflexibility, and contamination fear) are presented for each condition in Table 3. One-way ANOVAs were used to examine condition differences.

Control condition participants showed higher psychological flexibility than the Ticket-Only and Values + Tickets conditions ( $F(2, 197) = 3.446, p = .034$ ). There were no significant differences among groups on psychological inflexibility ( $F(2, 197) = 0.944, p = .391$ ), contamination fear ( $F(2, 197) = 0.468, p = .627$ ), or baseline BATs ( $F(2, 197) = 1.543, p = .216$ ).

Table 3. Preliminary Condition Differences

	N	BAT1		Flex*		Inflex		PI Con	
		M	Std. Dev.	M	Std. Dev.	M	Std. Dev.	M	Std. Dev.
Control	68	3.99	1.54	4.15	0.79	2.51	0.77	10.26	7.69
Ticket	64	4.00	1.87	3.81	0.70	2.69	0.73	9.19	6.23
Values	68	4.46	1.88	3.94	0.77	2.58	0.74	9.42	6.21

Note: \* $p < .05$ ; BAT1 = Baseline BATs, Flex = MPFI Psychological Flexibility Scale, Inflex = MPFI Psychological Inflexibility Scale, PI\_Con = Padua Inventory Contamination Fear Scale

Before continuing to our primary analysis, the approach behavior for the baseline and second round of BATs along with the difference in these approach scores (second BAT minus baseline BAT), scores for psychological flexibility, psychological inflexibility, and contamination fear were examined for normality using the Shapiro-Wilk test and skew and kurtosis. Results are presented in Table 4, Appendix. Based on the Shapiro-Wilk values, approach behaviors in both rounds of BATs and the difference in approach behaviors for all conditions were statistically significantly skewed at the full group and condition level at the  $p < .05$  level. For the self-report measures, contamination fear was significantly skewed at both levels, psychological inflexibility was significantly skewed at the group level but not at the condition level, and psychological flexibility was not skewed at any level.

Though ANOVAs, and therefore ANCOVAs, have an assumption of normality, the analysis is fairly robust to this assumption, especially with larger sample sizes (Khan & Rayner, 2003). After visually inspecting the distribution of scores and considering the sample size in each condition, we decided that the original analytic plan would continue.

An ANCOVA was conducted to identify differences in approach behaviors between baseline BAT and the second round of BATs (BATs occurring after conditional period) within and between conditions. Three covariates were used in this analysis. First, the number of approach behaviors in the baseline round of BATs was used to control for baseline approach

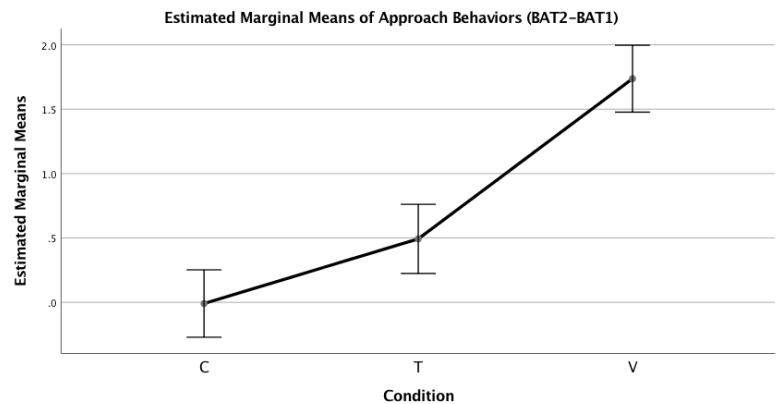
behaviors. Next, contamination fear was used because this is common in the contamination literature (e.g. Deacon & Olatunji, 2007) and contamination fear was found to be significantly related to the number of approach behaviors in the first round of BATs. Finally, psychological flexibility was used to control for preliminary group differences identified for this measure.

The ANCOVA revealed that there were significant differences between conditions in the approach behavior from the baseline round of BATs to the second round of BATs ( $F(2, 194) = 45.974, p < .001, \eta_p^2 = .322$ ). Post-hoc pairwise comparisons using Bonferroni corrections indicated that, as predicted, the Values + Tickets condition yielded differences larger than both the Tickets-Only condition ( $p < .001$ ) and the Control condition ( $p < .001$ ). Additionally, the Tickets-Only condition yielded differences slightly, but significantly, larger than the Control condition ( $p = .028$ ). Descriptive statistics are presented in Table 5 while a visual graph is presented in Figure 1.

Table 5. Descriptive Statistics and Statistics Adjusted for Covariates

	Mean	Std. Dev	Marginal Mean	Std. Error	95% CI
Control	.03	.791	-.009	.133	-.271 - .252
Ticket	.50	.873	.493	.136	.224 - .761
Values	1.69	1.48	1.737	.132	1.477 - 1.996

Figure 1.



Covariates appearing in the model are evaluated at the following values: BAT1 APPR = 4.15, PI\_CONR = 9.6350, Global\_Flex = 3.9730  
Error bars: 95% CI

**Hypothesis 3:** *The relationship between psychological flexibility and the difference in BAT scores will be moderated by the condition the participants are in. Specifically, those in the Values + Tickets condition will demonstrate a stronger relationship between psychological flexibility and BAT difference scores than those in the Control or Tickets-Only conditions.*

A moderation analysis was conducted to test the secondary hypothesis that those participants in the Values + Tickets condition will have a stronger relationship between psychological flexibility and their difference scores on the BATs than those in the Ticket or Control conditions. Model 1 of Hayes (2015) SPSS Process package was used for this analysis. The results yielded a change in  $R^2$  that was not significant ( $\Delta R^2 = .0026$ ,  $F(1, 196) = .7123$ ,  $p = .3997$ ) for the interaction of condition and psychological flexibility on BAT difference scores. The same analysis was conducted for psychological inflexibility. The results were similar in that there was a change in  $R^2$  that was not significant ( $\Delta R^2 = .0028$ ,  $F(1, 196) = .7123$ ,  $p = .3834$ ) for the interaction of condition and psychological inflexibility on BAT difference scores.

## IV. DISCUSSION

The purpose of this study was to experimentally test the impact of a values protocol on approach and avoidance behaviors to potentially aversive stimuli. If the opportunity to approach an object results in the organism avoiding the stimulus, the context has an aversive function. If the opportunity to approach an object results in the organism approaching the stimulus, the context has an appetitive function. This study examined how values may function as establishing stimuli, making a stimulus that was previously avoided to some extent (i.e. functionally aversive) into one that is approached (i.e. functionally appetitive).

### **Approach Behaviors, Reinforcement, and Values**

It was important to distinguish that behavior was occurring because of values as establishing stimuli versus an immediately delivered reinforcement in the environment. While reinforcement increases the probability of behavior reoccurring and/or occurring to a greater degree, establishing stimuli can alter the reinforcing function of stimuli used as reinforcers. For example, in both the Values + Tickets and Tickets-Only conditions, participants received tickets for approach behaviors. However, in the Values + Tickets condition, the participants were told that these tickets would be used in a drawing for a values-related charity. Participants in the Tickets-Only condition were not told anything about the tickets, and if the participants asked they were told that the tickets are just tickets. In this study, values served as the establishing stimuli while tickets served as an immediate generalized conditioned reinforcer.

As predicted, participants in the Values + Tickets condition had a larger difference in their approach behavior from the first to second round of BATs than participants in the Ticket or

Control conditions. Specifically, these participants engaged in an average of two more steps after their behaviors were related to their values compared to the Tickets-Only condition who engaged in between zero and one step more and the control condition whose behavior did not significantly change from one round to the other.

### **Contamination Fear**

As hypothesized, our analyses found that the participants that rated higher contamination fear on the PI questionnaire were more likely to avoid engaging with contaminated stimuli. This is consistent with previous contamination literature (e.g. Deacon & Maack, 2008). Our sample's mean rating of contamination fear was within one standard deviation of previously published college student and OCD samples (Burns et al., 1996). Because of our moderately large standard deviation (6.74), we can conclude that our sample contained individuals with a wide range of experiences of contamination fear.

### **Psychological Flexibility and Inflexibility**

The mean ratings of psychological flexibility and inflexibility were consistent with the ratings in the normative sample examined by Rolffs and colleagues (2018). As Rolffs et al. comment, psychological flexibility and psychological inflexibility may not be opposite sides of a single spectrum, but rather, separate sets of behaviors that can vary independently. This is exemplified by our analyses of the relationships between psychological flexibility and inflexibility and contamination fear. We found that participants with higher ratings of psychological inflexibility were likely to also have high ratings of contamination fear. However, there was no significant relation between psychological flexibility and contamination fear.

Additionally, contrary to our hypothesis, psychological flexibility and inflexibility was not related to approach behaviors. This may be because while the contamination fear items were

specific to the tasks, the psychological flexibility and inflexibility items were more general. For example, the first item of the MPFI reads, “I made room to fully experience negative thoughts and emotions, breathing them in rather than pushing them away,” while the first item of the contamination fear subscale of the PI reads, “I feel my hands are dirty when I touch money.” It may be that participants’ overall psychological flexibility and inflexibility ratings would be different if the items were specific to contamination fear (e.g. “I made room to fully experience negative thoughts and emotions about contamination, breathing them in rather than pushing them away”). The Acceptance and Action Questionnaire (AAQ; Bond et al., 2011) is another widely used measure of psychological inflexibility and it has been adapted to measure inflexibility with a number of content areas such as stigmatizing thoughts (Levin, Luoma, Lillis, Hayes, & Vilardaga, 2014), body image (Sandoz, Wilson, Merwin, & Kellum, 2013), diabetes (Gregg, Callaghan, Hayes, & Glenn-Lawson, 2007), and social anxiety (MacKenzie & Kocovski, 2010). Sandoz and colleagues (2013) propose that measures of content-specific psychological flexibility and inflexibility may be more sensitive to detecting predictors of treatment effects than more general measures.

## **Implications**

There are two major implications of this study. First, there are implications for research in both questionnaire research and research with behavioral tasks. Second, there are implications for using values in clinical work where treatment goals include engaging with stimuli that clients consider aversive.

**Basic Research.** Consistent with previous research, the behavioral approach tasks (BATs) served as an effective way to measure approach behavior. While some studies ask participants if they would be willing to engage in some hypothetical behavior, using BATs gives

researchers a way to directly measure the follow-through of this willingness. Our study also demonstrates that using the same BAT tasks close in time does not significantly change the participants' responses to those tasks. In other words, there is not an exposure effect when BATs are presented twice without overtly contingent consequences. This information can be used in research studies that are time sensitive and can only have participants present for a study at one time point. If there are changes from the first round of BATs to the second, it would likely be due to intervention rather than repeated exposure.

**Clinical Research and Applications.** This study offers clinical implications for clinicians working with clients with fears, phobias, and/or aversions. Specific to the theme of this study, clinicians working with a new client presenting for contamination fear or contamination related OCD could give their client the PI questionnaire. The results of this questionnaire would give the clinician an idea of how the client might behave around contaminated stimuli (i.e. approach or avoid and to what extent) and can serve as a baseline for exposure treatment.

The differences in the number of times participants approached and engaged with contaminated stimuli in the different conditions also has implications for clinical work. The BATs are very similar to some exposure preparations. In exposure therapy, clients are repeatedly introduced to the feared stimuli until the client is able to engage in daily activities even with the presence of the previously aversive stimuli. Though exposure therapy may seem like a simple process, there are sometimes responses to treatment that can lead to increased distress and discontinuation of treatment (Ong, Clyde, Bluett, Levin, & Twohig, 2016). It is important to consider ways that behavior can be maintained or increased in frequency (i.e. reinforced), especially in this inherently aversive protocol.



Our study supports the theory that simply relating a specific value to specific behaviors may increase the likelihood of that behavior occurring. While values-based behavior often results in explicit reinforcement, this is not always the case. In fact, some values-based behavior may result in aversive consequences. For example, sending a text to your mother is consistent with a value of family and a relationship with her, but that behavior does not guarantee that she will respond well or even respond at all. Even if your mother nags you when you text her, you may continue to text her because you have identified this behavior is consistent with your value. In other words, the behavior is more probable because there was coherence between values and behavior, which in-itself is reinforcing.

Values have become an important part of many clinical interventions. Interventions with a values component can be effective for a variety of presenting concerns such as anxiety (Codd, Twohig, Crosby, & Enno, 2011), depression (Zettle, Rains, & Hayes, 2011), and psychosis (Gaudio & Herbert, 2006). Branstetter-Rost and colleagues (2009) demonstrated that an intervention containing values and acceptance components led to participants tolerating an aversive (i.e. pain) task more than those just engaging in acceptance or in the control condition. However, the present study is one of the few that target values as a primary process of behavior change. The evidence suggests that if a clinician has limited time with clients, values alone can be used to enhance behavioral activation and/or exposure to aversive stimuli. This could be potentially helpful in primary care clinics, for example.

### **Limitations and Future Directions**

**Clinical Samples.** As stated previously, our sample contained participants rating in the average range for both contamination fear and psychological flexibility/inflexibility. It is possible that a clinical sample, one struggling with contamination fear and phobia, may have

more difficulty with the BATs. Future research could compare clinical and nonclinical samples to explore differences and values-intervention effectiveness with both groups.

**Measuring Private Events (Self-Report).** Part of this study employed one-time self-report measures of contamination fear and psychological flexibility/inflexibility. The potential problems with self-report in research are well documented (e.g. Boase & Ling, 2013; Tenkorang, Sedziafa, Sano, Kuuire, & Banchani, 2015; Wilcox, Bogenschutz, Nakazawa, & Woody, 2013). An alternative to one-time self-report might be to utilize ecological momentary time sampling (EMA; Shiffman, Stone, & Hufford, 2008). An EMA protocol would help researchers to examine the impact of contamination fear and intrusive thoughts in contamination fear on the lives of the participants.

Additionally, the two questionnaires examined in our study contained one directly related to the behavioral task (i.e. contamination fear) and one that was a general behavior and experience measure (i.e. psychological flexibility and inflexibility). The results suggest that perhaps having an adapted measure of psychological flexibility and/or inflexibility that directly relate to experiences of contamination fear might have yielded additional useful results, as it did for the PI contamination fear questionnaire. It may be helpful for researchers who are analyzing specific fears, phobias, or aversions to include content-specific measures in their study to analyze experiences directly related to both the content area and psychological process (e.g. psychological flexibility). However, our measure of psychological flexibility/inflexibility is a relatively new measure and could use further psychometric evaluation.

**BAT Challenges.** The BATs provided an objectively observable measure for this study. While participants could report whether or not they would be willing to engage with stimuli, the

BATs allowed the researchers to observe and record the approach behavior. However, this did not come free of challenges.

For example, one challenge had to do with the type of cookies presented to the participants. During training one of the research assistants reported that they would not eat the cookies if they contained nuts or gluten. Gluten free, nut free cookies were then bought to use in the actual study. Dietary sensitivities should be taken into account for future research as well.

The most intrusive challenge was the preparation of the “urine” task and participant’s response to it. The preparation consisted of a mixture of apple juice and water. While it did look like urine, some of the participants reported that they could smell the apple juice. Future research using this preparation could use urine scent (i.e. deer urine scent at a hunting store) so that the preparation is more believable.

**Sample and Demographics.** As stated previously, experimenter error lead to individual demographic questionnaires not being completed by participants. This is unfortunate as not only are we unable to get a full group demographic picture, we are also unable to assess for demographic differences between groups. However, the primary investigator was able to obtain aggregate demographic data from the university registrar for the second half of participants. This data was consistent with participant data from other psychological studies conducted with college samples at public universities in the south (predominately white females with an average age of about 19 years).

It would be important, however, for future research to include a replication of this study where differences between groups can be controlled for, or at least identified. Additionally, even if the complete demographic data of this study matched the aggregate demographic data were able to obtain, the data is not representative of all types of individuals. Different genders,

cultures, and ages may respond differently to this preparation. Future research may include replications and/or expansion of this study beyond a convenient college sample.

**How to use Values in an Experimental Setting.** While the BAT preparation resulted in both approach and avoidance behaviors in participants, it can be improved. Recruiting participants with specific difficulties and have BATs directly related to that difficulty would be a closer representation of clinical interventions like exposure. For example, if participants with a bug phobia were recruited, BATs with bugs would closely resemble exposure therapy for someone presenting with a bug phobia in a psychotherapy clinic. However, this can be difficult in an academic and research setting.

## **Conclusion**

Both basic and applied research has resulted in support for using interventions with a values component to promote behavior change. However, there is little research on the process of values to influence behavior change. This study aimed to examine a values intervention as an establishing stimulus for values-based behavior change without directly targeting any other components of ACT (e.g. acceptance or defusion).

This is important because many behavioral psychotherapy interventions often encourage clients to do very difficult things to improve their mental health. For example, clients with depression are asked to engage in behavioral activation when they are also experiencing aversive private events (e.g. Lejuez et al., 2001). For clients with anxiety-related difficulties, exposure-based treatments are the most effective intervention, having the client repeatedly engage with aversive stimuli and/or situations (Foa & McLean, 2016). However, there has been little research on what can function as a reinforcer or establishing operation for engaging in these interventions other than assuming that symptom remission will be an adequate reinforcer.

Thus, an empirical analysis of how values influence behavior has been warranted for some time. Not only does this study begin to explore a brief intervention that primarily focuses on the process of values, it adds to the growing literature that a values component can be a useful part of any therapeutic intervention that includes clients engaging in experiences they identify as aversive. Though this study is a small step in the direction of empirically demonstrating how values influence behavior, it is one of the first to include data behind the claim that values can play a significant role in behavior change.

## LIST OF REFERENCES

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## APPENDIX

APPENDIX

Table 1. Frequency of Participant Approach to Presented Stimuli

<b>BAT Round</b>	<b>Number of Approach Opportunities Taken</b>	<b>Number of Participants</b>	<b>Percent of Participants</b>
BAT1	0	1	0.5
	1	11	5.5
	2	16	8.0
	3	54	27.0
	4	38	19.0
	5	42	21.0
	6	15	7.5
	7	13	6.5
	8	8	4.0
	9	2	1.0
BAT2	0	0	0.0
	1	7	3.5
	2	16	8.0
	3	32	16.0
	4	38	19.0
	5	41	20.5
	6	19	9.5
	7	15	7.5
	8	20	10.0
	9	12	6.0

*Note:* BAT1 = Baseline BATs, BAT2 = Second Round of BATs.

Table 4. Skew, Kurtosis, and Normality (Shapiro-Wilk)

		Skew		Kurtosis		Shapiro-Wilk	
		Stat	Std. Error	Stat	Std. Error	Stat	Sig.
<b>Group</b>							
BAT1		.410	.172	-.039	.342	.954	.000*
BAT2		.304	.172	-.676	.342	.950	.000*
BAT Diff		1.488	.172	2.261	.342	.784	.000*
Flex		.086	.172	-.247	.342	.992	.293
Inflex		.461	.172	.070	.342	.985	.028*
PI_Con		1.151	.172	1.002	.342	.904	.000*
<b>Condition</b>							
BAT1	C	.177	.291	-.097	.574	.957	.021*
	T	.407	.299	-.342	.590	.941	.004*
	V	.473	.291	.011	.574	.942	.003*
BAT2	C	.324	.291	-.083	.574	.949	.007*
	T	.566	.299	-.233	.590	.942	.005*
	V	-.113	.291	-1.059	.574	.930	.001*
BAT Diff	C	2.555	.291	12.195	.574	.536	.000*
	T	1.478	.299	2.265	.590	.733	.000*
	V	.832	.291	.216	.574	.890	.000*
Flex	C	-.042	.291	-.015	.574	.992	.951
	T	.031	.299	-.151	.590	.987	.739
	V	.128	.291	-.473	.574	.973	.147
Inflex	C	.627	.291	.297	.574	.970	.105
	T	.377	.299	-.214	.590	.973	.173
	V	.426	.291	.405	.574	.980	.358
PI_Con	C	1.347	.291	1.161	.574	.853	.000*
	T	.672	.299	-.194	.590	.948	.009*
	V	1.092	.291	.741	.574	.903	.000*

Note: \* $p < .05$ ; BAT1 = Baseline BATs, BAT2 = Second Round of BATs, Flex = MPFI Psychological Flexibility Scale, Inflex = MPFI Psychological Inflexibility Scale, PI\_Con = Padua Inventory Contamination Fear Scale, C = Control condition, T = Tickets-Only condition, and V = Values + Tickets condition.

VITA

**Emmie R. Hebert, M.A.**

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**Education**

**Doctor of Philosophy** **Anticipated August 2019**

University of Mississippi – Oxford, MS

**Major:** Clinical Psychology (APA-Accredited Program)

**Dissertation:** Doing Hard Things in the Context of Values: The Transformation of Stimulus Function Using Values as an Establishing Operation

**Dissertation Advisor:** Kelly Wilson, Ph.D.

**APA Accredited Predoctoral Internship:** Munroe-Meyer Institute

Behavioral Pediatrics and Integrated Care Track

University of Nebraska Medical Center

Part of the Nebraska Internship Consortium in Professional Psychology

**Master of Arts** **December 2016**

University of Mississippi – Oxford, MS

**Major:** Clinical Psychology

**Thesis:** Identifying Values: Comparing Four Methods of Values Identification

**Thesis Advisor:** Kelly Wilson, Ph.D.

**Bachelor of Science** **May 2013**

University of Louisiana at Lafayette – Lafayette, LA

**Major:** Psychology

**Minor:** English

**Advisor:** Emily K. Sandoz, Ph.D.

**Certifications and Achievements**

Passed the NCMHCE **October 2018**

Completed training for the ADOS-2 **August 2018**

**Passed EPPP at the Doctoral Level** **August 2017**

Registered Behavior Technician **March 2017**

Behavior Analyst Certification Board

Credential Number: RBT-17-30602

## **Research Activity**

*Research Assistant, Munroe-Meyer Institute* **Summer 2018–Present**

University of Nebraska Medical Center – Omaha, NE

Involvement in research projects as part of predoctoral internship. Projects include:

- 3...2...1 ACTion!: A Unified Approach to Acceptance and Commitment Therapy for Adolescents (supervised by Mindy Chadwell, PhD)
  - Development of a clinical protocol that utilizes a single metaphoric theme (theater) to present the principles of Acceptance and Commitment therapy.
- Effects of Cybercycling on Academic Functioning and Health Outcomes on Children with Autism Spectrum Disorder (supervised by Sara Kupzyk, PhD, BCBA)
  - Assist with data collection of student cycling and academic behavior in students with autism spectrum disorder at a local elementary school.

*Research Assistant, Mississippi Center for Contextual Psychology* **Fall 2013–Present**

University of Mississippi – Oxford, MS

Duties included writing research proposals, conducting experiments, mentoring undergraduate research assistants, and managing and analyzing data. Additional duties include mentoring undergraduate in project and professional development skills.

Supervisors: Kelly G. Wilson, Ph.D. & Kate Kellum, Ph.D.

*Graduate Student Mentor, Ronald E. McNair Summer Program* **July 2016 & July 2017**

University of Mississippi – Oxford, MS

Faculty Mentor: Kate Kellum, PhD

This program mentors undergraduates in the development and completion of a summer research program from start to finish. Students develop a research idea, conduct a related experiment/study, analyze the data, and present and write up their findings within six weeks. As a mentor I guide and assist the student scholars in this process.

Student Mentee: Samantha Knowles, University of Mississippi (July 2017)

Project: Stickers as a Reinforcer for Credit Card Sign Ups in a Retail Store

Student Mentee: Amanda Dortch, Tugaloo College (July 2016)

Project: A Child's Perspective of Skin Tone

*Research Team Member, Get Fit! Child Health and Behavior Lab* **2013-2015**

University of Mississippi – Oxford, MS

Team members attended lab meetings and served as peer reviewers and co-researchers in conceptualizing research projects. Team members also supported other members in research development and presentation.  
Supervisor: Karen Christoff, Ph.D.

*Ronald E. McNair Fellow*, Ronald E. McNair Fellowship Program **2012-2013**  
University of Louisiana at Lafayette – Lafayette, LA  
Led a research project through the Ronald McNair Fellowship Program. Project included literature review, research design, data collection, data analysis, and presentation.  
Project: Using Derived Relational Responding to Model Statistics Learning Across Participants with Varying Degrees of Statistics Anxiety  
Supervisor: Emily K. Sandoz, Ph.D.

*Research Assistant*, Louisiana Contextual Science Research Group **2011-2013**  
University of Louisiana at Lafayette – Lafayette, LA  
Assisting with research design, data collection, data entry, and analysis on various studies. Additional duties include peer mentoring other students on academic and professional development.  
Supervisor: Emily K. Sandoz, Ph.D.

## **Grant Experience**

*Research Assistant*, Research Grant **2011-2013**  
University of Louisiana at Lafayette – Lafayette, LA  
Assist in participant recruitment, data collection, and data entry for a two-phase project that includes eight studies. Grant entitled, “The 'Me' I See: Verbal Learning Processes in Body Image Disturbance.” Funded by the Louisiana Board of Regents Support Fund Research Competitiveness.  
Subprogram Grant #: LEQSF(2011-14)-RD-A-29.  
Supervisor: Emily K. Sandoz, Ph.D.

## **Teaching Experience**

*Instructor of Record*, The University of Mississippi  
Oxford, MS  
*Undergraduate courses:*

**Learning**

**Fall 2017 & Spring 2018**

Responsible for all aspects of this course. Used interteaching method and behavioral principles to enhance the learning context in a class focused on basic laws and theories of learning.

*Predoctoral Intern/Graduate Teaching Assistant*, University of Nebraska Medical Center  
Omaha, NE

*Graduate Courses*

**Learning**

**Fall 2018 (Present)**

Instructor: Sara Kupzyk, PhD, BCBA

Assist in leading class discussion, management of classroom activities, student questions/tutoring, Canvas (BlackBoard), guest lecturing and grading.

*Graduate Teaching Assistant*, The University of Mississippi  
Oxford, MS

*Graduate courses:*

**Learning**

**Fall 2015 & Fall 2017**

Instructor: Kelly G. Wilson, PhD.

Assisted in leading student study groups, management of classroom activities, student questions, BlackBoard, and grading.

**Personality Assessment**

**Spring 2016**

Instructor: Danielle Maack, PhD.

Assisted in management of classroom activities, student questions, assessment practice, and grading and providing feedback on graduate student assessments including MMSE, Suicide Assessments, MINI-5, SCID-2, and ADHD Assessment (CPT, DIVA, etc.).

**Quantitative Methods in Psychology II**

**Spring 2016**

Instructor: Michael T. Allen, PhD.

Assisted in management of classroom activities, student questions, BlackBoard, and grading.

**Cognitive Assessment**

**Fall 2015**

Instructor: Stefan Schulenburg, PhD.

Assisted in management of classroom activities, student questions, assessment practice, and grading assessments including MMSE, WAIS-IV, and WIAT-III.



**Quantitative Methods in Psychology I**

**Fall 2015**

Instructor: Elicia Lair, PhD.

Assisted in management of classroom activities, student questions, BlackBoard, and grading.

*Undergraduate courses:*

**General Psychology (Online)**

**Summer 2018**

Instructor: Jennifer Caldwell, PhD.

Assisted in grading and moderating student discussion via BlackBoard. Answered student questions through email and video conference.

**Learning**

**Spring 2014**

Instructor: Kelly G. Wilson, PhD.

Assisted in student study groups, management of classroom activities, student questions, BlackBoard, guest lecturing, and grading.

**General Psychology**

**Fall 2013 & Spring 2014**

Instructor: Karen Christoff, PhD.

Assisted in management of a Self-Paced (PSI) class along with peer proctors. This included classroom management, BlackBoard, student questions, grading, and tutoring.

**Abnormal Psychology**

**Fall 2013**

Instructor: Kelly G. Wilson, PhD.

Assisted in student study groups, management of classroom activities, student questions, BlackBoard, guest lecturing, and grading.

*Teaching Assistant, The University of Louisiana at Lafayette  
Lafayette, LA*

**Psychology of Adjustment (Psychological Flexibility)**

**Fall 2011**

Instructor: Emily K. Sandoz, PhD.

Assisted in management of online gradebook, student questions, class preparations, and grading.

**General Psychology I**

**Fall 2011**

Instructor: Emily K. Sandoz, PhD.

Assisted in management of online gradebook, student questions, class preparations, and grading.

## **Administrative Experience**

*Assistant to Director of Clinical Training* **2015–2016**  
University of Mississippi – Oxford, MS  
Duties included assisting in maintaining records and programs pursuant to APA accreditation, assisting incoming new graduate students in acclimating to the university and orientation, assisting prospective graduate students, planning and organizing interview weekend (February 2016), and assisting the following year’s incoming graduate students with registration and housing.  
DCT: Alan M. Gross, Ph.D.

## **Clinical Experience**

*Predoctoral Intern and Therapist, Munroe-Meyer Institute-Behavioral Pediatrics* **Fall 2018**  
**(Present)**  
University of Nebraska Medical Center – Omaha, NE  
Provide behavioral services and support to children with and without developmental disabilities presenting with difficulties such as noncompliance, aggression, tantrum, anxiety and emotional disturbance with a focus on parent training.  
Supervision provided by Mark Shriver, Ph.D., BCBA-D

*Predoctoral Intern and Supervisor, Munroe-Meyer Institute – Academic Evaluation and Intervention Clinic* **Fall 2018 & Spring 2019 (Present)**  
University of Nebraska Medical Center – Omaha, NE  
Supervise master’s level school psychology students providing services for children experiencing academic difficulties. Assessment and intervention are behavioral in nature and based on the response to intervention (RTI) model. Additionally, providing services to parents including community and school supports.  
Supervision provided by Sara Kupzyk, Ph.D., BCBA

*Autism/Social Skills Group Co-Leader, Psychological Services Center* **Spring 2017–Summer 2018**  
University of Mississippi – Oxford, MS  
Co-facilitate group lessons, activities, and role-plays directed at increasing the social skills of the members of the group using an Interactive Behavior Therapy approach. Members are community youth aged 12-15.  
Supervision provided by John Young, Ph.D. and Sheila Williamson, Ph.D., BCBA-D

- Therapist Intern and Examiner (RBT)*, Integrated Health **Fall 2016–Spring 2018**  
 Southaven, MS  
 Assist in diagnostic and functional assessment, behavior therapy, social skills groups, and applied behavior analysis (ABA) for children and adolescents with conditions such as Autism Spectrum disorder, ADHD, anxiety, depression, Fragile X Syndrome, and related neurodevelopmental and neurobehavioral disorders. ABA duties are performed as a registered behavior technician (RBT).  
 Supervision provided by Sheila Williamson, Ph.D., BCBA-D
- Graduate Student Therapist*, Psychological Services Center **Summer 2014–Summer 2018**  
 University of Mississippi – Oxford, MS  
 Duties include conducting screenings, intakes, and individual psychotherapy for University of Mississippi students and community members.  
 Supervision provided by Alan Gross, Ph.D., Kelly Wilson, Ph.D., Laura Dixon, Ph.D., John Young, Ph.D., and Scott Gustafson, Ph.D., ABPP
- LGBTQA Group Co-Leader*, Psychological Services Center **Fall 2015**  
 University of Mississippi – Oxford, MS  
 Duties include providing psychoeducation facilitating emotional processing for a support group on LGBTQA issues faced by University of Mississippi college students.  
 Supervision provided by Laura Johnson, Ph.D.
- Behavioral Data Recording*, Level Up Consulting **2015–2016**  
 Senatobia, MS  
 Assist in observation and data collection for functional behavioral assessments in adult residents at the North Mississippi Regional Center, an intermediate care facility for adults with intellectual/developmental disabilities.  
 Supervision provided by Shannon Hill, Ph.D., BCBA
- Education and Research Intern and Therapist*, The Baddour Center **2014–2015**  
 Senatobia, MS  
 Assist and build behavioral programs for residents of the center, provide individual therapy, run social skills groups, and provide positive behavior support within a residential setting for adults with intellectual disabilities.  
 Supervision provided by Shannon Hill, Ph.D., BCBA
- Behavior Analysis Instructor – Level 1*, Therapy Center of Acadiana **2012-2013**  
 Scott, LA  
 Implementing applied behavior analysis (ABA) programs designed by the supervised

board certified behavior analyst for children with a variety of developmental delays, most commonly Autism Spectrum Disorder.  
Supervision provided by Justin Daigle, M.A., BCBA

## **Publications**

Flynn, M. K., Hernandez, J. O., **Hebert, E. R.**, James, K. K., & Kusick, M. K. (2017) Cognitive fusion among Hispanic college students: Further validation of the cognitive fusion questionnaire. *Journal of Contextual Behavioral Science*, 7, 29-34.

**Hebert, E. R.**, Seifen-Adkins, T., & Gross, A. M. (2017). The DATA model for teaching preschoolers with autism - book review. *The Behavior Analyst*, 40, 1-3.

Sandoz, E. K., & **Hebert, E. R.** (2016). Using derived relational responding to model statistics learning across participants with varying degrees of statistics anxiety. *European Journal of Behavior Analysis*. doi:10.1080/15021149.2016.1146552

Sandoz, E. K., & **Hebert, E. R.** (2015). Meaningful, reminiscent, and evocative: An initial examination of four methods of selecting ideographic values-relevant stimuli. *Journal of Contextual Behavioral Science*, 4, 277-280. doi:10.1016/j.jcbs.2015.09.001

## **Works in Progress**

**Hebert, E. R.**, Tynes, B. L., Kellum, K.K., & Wilson, K. G. The Things You Can Teach When They Seem Out of Reach: Using adapted ABA techniques in a limited resource setting.

## **Symposium and Paper Presentations:**

\*Denotes mentored student presenter

**Hebert, E. R.**, Tynes, B. L., Kellum, K. K., & Wilson, K. G. (2018, May). *The Things You Can Teach When They Seem Out Of Reach: The Product of Clinical Psychology and Applied Behavior Analysis Co-Therapy*. Presentation at the 44<sup>th</sup> annual convention of the Association for Behavior Analysis International, San Diego, CA.

\*Adams, C. D., **Hebert, E. R.**, Avila, B. N., Kellum, K. K., Wilson, K. G., & Miller, S. (2018, April). *What the Flex?: The Relationship Between Cognitive and Psychological Flexibility*. Presentation at the 5th annual University of Mississippi Conference on Psychological Science, Oxford, MS

Knowles, S. L., **Hebert, E. R.**, & Kellum, K. K. (2018, March). *Stickers as a Reinforcer for Credit Card Sign Ups in a Retail Store*. Presentation at the annual conference of the Behavior Analysis Association of Mississippi, Bay St. Louis, MS.

\*Sudduth, H. K., **Hebert, E. R.**, & Kellum, K. K. (2017, May). *Examining the Potential Role of Socioeconomic Status Biases on Perception of Political Candidates*. Presentation at the annual convention of the Association for Behavior Analysis International, Denver, CO.

\*Stewart, L., Dortch, A. D., **Hebert, E. R.**, & Kellum, K. K. (2017, April). *Children's Perspective of Skin Tone*. Presentation at the annual University of Mississippi Conference on Psychological Science, Oxford, MS.

Protti, T., Williams, N., Boullion, G. Q., **Hebert, E. R.**, Sandoz, E. K., & Bordieri, M. (2016, May). *Learning With Purpose: A Preliminary Demonstration of Derived Transformation of Values Functions*. Presentation at the annual convention of the Association for Behavior Analysis International, Chicago, IL.

**Hebert, E. R.**, Kellum, K. K., Whiteman, K. C., & Wilson, K. G. (2015, May). *This Is How We Do: Use of Word-Level IRAP Analyses to Identify Relative Flexibility and Inflexibility with Specific Verbal Stimuli*. Presentation at the annual convention of the Association for Behavior Analysis International, San Antonio, TX.

**Hebert, E. R.**, Kellum, K. K., Sandoz, E. K., & Wilson, K. G. (2015, May). *Raisin' Them Right: Undergraduate Behavior Analysis Research Labs in Psychology*. IGNITE presentation at the annual convention of the Association for Behavior Analysis International, San Antonio, TX.

Jacobson, E., Kurz, S., **Hebert, E. R.**, Kellum, K. K., & Wilson, K. G. (2015, May). *Early Bird Gets the A: Is GPA Related to When in the Semester Students Participate in Research Studies, and Does it Matter?* Presentation at the annual convention of the Association for Behavior Analysis International, San Antonio, TX.

Auzenne, J., Boullion, G. Q., **Hebert, E.**, Greene, S., Bordieri, M., & Sandoz, E. K. (2014, June). *Seeing is Believing: Toward a Behavioral Measure of Psychological Flexibility*. Presentation at the Association for Contextual Behavioral Science World Conference XII, Minneapolis, MN.

Auzenne, J., **Hebert, E.**, & Sandoz, E. K. (2014, June). *Making a Significant Difference: Creating a Context for the Development of Student Researchers in Psychology*.

Presentation at the Association for Contextual Behavioral Science World Conference XII, Minneapolis, MN.

**Hebert, E. R.,** Kellum, K. K., & Wilson, K. G. (2014, June). *But Wait! There's More!: The Utility and Efficacy of an Undergraduate Research Lab at Ole Miss*. Presentation at the Association for Contextual Behavioral Science World Conference XII, Minneapolis, MN.

Jacobson, E. H. K., **Hebert, E. R.,** Kurz, A. S., Wilson, K. G., & Kellum, K. K. (2014, June). *Investigating the Relation Between Self-Compassion and Values-Based Action in a Sample of College Students*. Presentation at the Association for Contextual Behavioral Science World Conference XII, Minneapolis, MN.

**Hebert, E. R.,** Kellum, K. K., & Wilson, K. G. (2014, May). *It's Not About Lunch Money: Effects of Past Bullying on Present Functioning in College Students*. Presentation at the annual convention of the Association for Behavior Analysis International, Chicago, IL.

Moyer, D. N., **Hebert, E.,** & Sandoz, E. K. (2013, July). *Goals worth reaching: Investigating the impact of a S.M.A.R.T. Goals intervention with and without a valued living component on students in an introductory psychology class*. Presentation at the Association for Contextual Behavioral Science Annual Convention, Sydney, Australia.

Daigle, J. J., Cordova, S., & **Hebert, E.** (2013, May). *Using a Response Cost Procedure to Reduce Stereotypy*. Presentation at the Association for Behavior Analysis International Annual Convention, Minneapolis, MN.

\*Fusilier, S., **Hebert, E.,** Greene, S., Sandoz, E. K. (2013, May) *What the stats?: The relationship between psychological flexibility and statistics anxiety*. Presentation at the Association for Behavior Analysis International Annual Convention, Minneapolis, MN.

**Hebert, E.** & Sandoz, E. K. (2013, May). *Making a significant difference: Creating a context for the development of student researchers in psychology*. Presentation at the Association for Behavior Analysis International Annual Convention, Minneapolis, MN.

Miller, S. A., **Hebert, E. R.,** & Sandoz, E. K. (2013, May). *Verbal Behavior and RFT: From Philosophy to Practice*. Presentation at the Association for Behavior Analysis International Annual Convention, Minneapolis, MN.

Mullen, A., Quebedeaux, G., Greene, S., **Hebert, E.,** & Sandoz, E. K. (2013, May). *Assessing Psychological Flexibility: A RFT-Based Behavioral Measure*. Presentation at the Association for Behavior Analysis International Annual Convention, Minneapolis, MN.

Sandoz, E. K., Flynn, M. K., Kellum, K. K., & **Hebert, E. R.** (2013, May). *Making change that matters: Values-based behavior plans in Applied Behavior Analysis*. Presentation at the Association for Behavior Analysis International Annual Convention, Minneapolis, MN.

\*Thibeaux, K., Greene, S., **Hebert, E.**, Quebedeaux, G., & Sandoz, E. K. (2013, May). *The Mind in the mirror: Derived relational responding and body image*. Presentation at the Association for Behavior Analysis International Annual Convention, Minneapolis, MN.

\*Benoit, B., **Hebert, E. R.**, Quebedeaux, G., Greene, S., & Sandoz, E. K. (2012, July). *ACT on Campus: Facilitating Psychological Flexibility for College Adjustment*. Presentation at the Association for Contextual Behavioral Science Annual Convention, Washington, D. C.

\*Fusilier, S., Moyer, D. N., **Hebert, E. R.**, Jacobelli, J. & Sandoz, E. K. (2012, July). *The Aftermath of Anxiety: The Role of Psychological Flexibility in Math Anxiety in College Students*. Presentation at the Association for Contextual Behavioral Science Annual Convention, Washington, D. C.

Greene, S., **Hebert, E.**, & Sandoz, E. K. (2012, July). *Derived Relational Responding and Body Image Disturbance*. Presentation at the Association for Contextual Behavioral Science Annual Convention, Washington, D.C.

**Hebert, E. R.** & Sandoz, E. K. (2012, May). *Going From Null to Neat-O: Psychological Flexibility Processes Applied to a Behavioral Statistics Study Group*. Symposium presented at the Association for Behavior Analysis International Conference, Seattle, WA.

\*Boudoin, V., Marks, S. K., **Hebert, E. R.**, Greene, S., & Sandoz, E. K. (2012, May). *Asking About What Really Matters: A Comparison of Different Methods of Generating Values-Related Stimuli*. Symposium presented at the Association for Behavior Analysis International, Seattle, WA.

Landry, D. E., **Hebert, E. R.**, & Sandoz, E. K. (2012, May). *Moving on Up: The Psychological Inflexibility of First Generation and Low Income Freshmen*. Symposium presented at the Association for Behavior Analysis International, Seattle, WA.

## **Poster Presentations**

\*Denotes mentored student presenter

\*Black, K., Kellum, K. K., **Hebert, E. R.**, Myers, J., & Wilson, K. G. (2017, May). *Development and Evaluation of Litter Reduction Data Collection System*. Poster presented at the

annual meeting of the Association for Behavior Analysis International, Denver, CO.

\*Dingus, C., **Hebert, E. R.**, Kellum, K. K., & Wilson, K. G. (2017, May). *Identifying What Matters: Comparing Four Methods of Values Identification*. Poster presented at the annual meeting of the Association for Behavior Analysis International, Denver, CO.

Mullen, A., **Hebert, E. R.**, Protti, T., Bordieri, M., & Sandoz, E. K. (2013, October). *Raising the Confidence Coefficient: Derived Relational Responding, Statistics Anxiety, and Core Statistic Skills*. Poster presentation at the Association of Behavior Analysis International: International Conference. Merida, Mexico.

### **Chair Roles**

**Hebert, E. R.**, Kessler, M. L., Knealing, T. W., Johnson, E. T., & Kellum, K. K. (2017, May). *Behavior Analysis and Academic Assessment in Higher Education*. Panel at the annual meeting for the Association for Behavior Analysis International, Denver, CO.

**Hebert, E. R.**, Leigland, S., Sandoz, E. K., & Pritchard, J. K. (2016, May). *The Value of Values: Looking at Values Through a Behavioral Analytic Lens*. Panel presentation at the annual convention of the Association for Behavior Analysis International, Chicago, IL.

**Hebert, E. R.**, Biglan, A., Murrell, A. M., Coyne, L. W., & Hayes, L. (2014, June). *ACT on Bullying: Using Contextual Behavioral Science with Bullying in Youth*. Panel presentation at the Association for Contextual Behavioral Science World Conference XII, Minneapolis, MN.

**Hebert, E. R.**, Biglan, A., & Ross, S. W. (2014, May). *Smack Talk: Bullying and Behavior Analysis*. Panel presentation at the annual convention of the Association for Behavior Analysis International, Chicago, IL.

**Hebert, E. R.**, Miller, S. A., Mclean, A., & Sandoz, E. K. (2013, May). Symposium Chair. *Bridging the Gap: Bringing Contextual Behavioral Science to Traditional Behavior Analysis*. Symposium presented at the Association for Behavior Analysis International Annual Convention, Minneapolis, MN.

### **Workshops Assisted**

Wilson, K. G., Kurz, A. S., Jacobson, E. H. K., & **Hebert, E. R.** (2014, July). *An Experiential Introduction to Acceptance and Commitment Therapy (Not Just for beginners)*.



Workshop presented at the annual meeting of the Association for Contextual Behavioral Science in Minneapolis, MN.

### **Service**

<i>Student Representative to the Clinical Faculty</i> University of Mississippi	<b>2017-2018</b>
<i>Departmental Survival Guide for Graduate Students, Chair and Lead Developer</i> University of Mississippi	<b>2017</b>
<i>Qualtrics Workshop, Leader</i> University of Mississippi	<b>April 2016</b>
<i>UM Conference on Psychological Science, Committee Member</i> University of Mississippi	<b>2015–2018</b>
<i>Psyched Out!: Psychology Symposia/Colloquia, Co-Organizer</i> University of Louisiana at Lafayette	<b>2012-2013</b>
<i>JMP Workshop, Facilitator</i> University of Louisiana at Lafayette	<b>April 2012</b>
<i>ACBS Program Committee Member</i> Association for Contextual Behavioral Science	<b>2011–2012</b>
<i>Experimental Psychology Study Group, Director</i> University of Louisiana at Lafayette	<b>2011–2012</b>

### **Professional Association Memberships**

Association for Behavioral Analysis International, Student Member	<b>Present</b>
Association for Contextual Behavioral Science, Student Member	<b>Present</b>
Association for Behavioral and Cognitive Therapies, Student Member	<b>Present</b>
Phi Kappa Phi Honor Society, Member	<b>2013–2014</b>
Psi Chi International Honor Society, Member, Historian (2012), President (2012-2013)	<b>2011–2013</b>

## **References**

Kelly G. Wilson, Ph.D.  
Professor  
Department of Psychology  
University of Mississippi  
205 Peabody  
University, MS 38655  
[kwilson@olemiss.edu](mailto:kwilson@olemiss.edu)  
662.816.5189

Kate Kellum, Ph.D.  
Assistant Professor  
Department of  
Psychology  
University of Mississippi  
205 Peabody  
University, MS 38655  
[kkellum@olemiss.edu](mailto:kkellum@olemiss.edu)  
662.832.1358

Alan Gross, Ph.D.  
Professor  
Department of Psychology  
University of Mississippi  
205 Peabody  
University, MS 38655  
[pygross@olemiss.edu](mailto:pygross@olemiss.edu)  
662.915.5186

Mark D. Shriver, Ph.D., BCBA-D  
Director, Applied Behavior Analysis Program  
University of Nebraska Omaha  
Professor, Psychology, Pediatrics  
Munroe-Meyer Institute  
University of Nebraska Medical Center  
Omaha, NE 68198  
[mshriver@unmc.edu](mailto:mshriver@unmc.edu)  
402.559.6408

Sara Kupzyk, PhD, BCBA  
Assistant Professor, Psychology, Pediatrics  
Munroe-Meyer Institute  
University of Nebraska Medical Center  
Omaha, NE 68198  
[sara.kupzyk@unmc.edu](mailto:sara.kupzyk@unmc.edu)  
402.559.8470