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A Comparison of ACT Values Procedures to Increase Valued Behaviors

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Abstract

In Acceptance and Commitment Therapy (ACT), therapists use various procedures to identify and clarify clients' personal values with the aim of increasing engagement in valued behaviors. This study sought to determine the relative effectiveness of two common values procedures. Participants were recruited from a national online sample of Amazon Mechanical Turk workers. Participants that met inclusion criteria and provided complete and valid data were included in analyses ($N = 236$). In this study, a values intervention (Values-Alone; VA) and a values intervention with an added behavior-consistency assessment procedure (VBC condition) were compared with an active control condition. Both values procedures involved writing about a topic of concern and responding to an assessment of discrete valued actions, such as, "It is important to take care of people who are less fortunate." However, the VBC condition contained an additional task of rating consistency between recent behaviors and personal values. The control condition consisted of writing tasks and assessment of attitudes on the topic of time management practices. Participants were later presented with an opportunity to donate a portion of their earnings. Cragg Hurdle Regression Analyses indicated that both the VBC and VA conditions effectively increased the likelihood of donation to charity compared to the active control condition ($b = .56, p = .01$; and $b = .58, p = .008$, respectively). However, the VBC and VA conditions did not differ in their relative influence on whether or not individuals donated ($b = -.02, p = .91$). A discussion of study findings in addition to future directions for research will be presented.

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Values in Psychotherapy

Colloquially, values are understood to encompass domains of living that are important to an individual or collective (Bonow & Follette, 2009). They may include ways of living (e.g., mindfully), behaviors (e.g., exercise), relationships, or more tangible aspects of life (e.g., objects). Within the broader psychology literature, definitions of values are similar to this colloquial understanding, although with some variation.

While different theories may provide different accounts of the functions or purposes of values, an examination of the history of psychotherapy traditions reveals that values have been widely recognized as relevant to—if not at the heart of—the work of psychologists and therapists. Across multiple psychotherapy traditions, there is widespread recognition that values serve important functions in the lives of clients and can be powerful motivators of behavior.

Most psychoanalysts would acknowledge the importance of values in therapy and in case conceptualization (Meissner, 1983), although this was not always true. Freud paid little attention to values, with only brief mentions that they should be avoided in therapy (Lytton, 1983). However, many of Freud's psychoanalytic successors did not agree with this stance (Meissner, 1983; Horowitz, 2014). From a modern Psychoanalytic perspective, values consist of complex motivations that are related to drive states, and therefore it has been argued that values are important drivers of behavior (Zinberg, 1967). One prominent psychoanalyst, John E. Gedo (1979) posited that, "...the personality as a whole is most fruitfully understood as a hierarchy of potentials for action, i.e., of both organismic and subjective goals, as modified by a system of values" (pp. 11-12; c.f. Meissner, 1983).

The importance of values has also been recognized in Humanistic approaches. Carl Rogers wrote of valuing as a process of actualization, or fulfilling one's potential (Rogers, 1959) that was basic to the nature of all humans, and that could lead to self-enhancement if and when individuals were willing to "get close to their own experiencing," or take an open stance toward their inner feelings (Rogers, 1964, p. 165). Rogers further believed that human values had potential beyond even self-enhancement, positing that human values could enhance social, cultural, and evolutionary processes (Rogers, 1964).

B.F. Skinner, while not well known in the field of psychology for a concentration on values specifically, did conceptualize values as things that are called "good" in the environment, or otherwise as positive reinforcers. He believed that values served as purposes (or functions) of behavior, and that many values became "good" over the course of evolutionary history; what was "good" served advantages to the individual and eventually the species (Skinner, 1971; see also Yadavia & Hayes, 2009).

In the last two decades, experts from various psychotherapeutic orientations have been explicit in their discussions of values as important elements of both theory and treatment. Several recent publications detail specific techniques for exploring client values in therapy, including techniques specifically for Motivational Interviewing (Wagner & Sanchez, 2009), for stand-alone use or as adjunct practices to existing treatments (see Cameron, Palm Reed, Guadiano, 2014; Kirschenbaum, 2013; Mickelburgh, 1992), and most prevalently at the current time, for use with Acceptance and Commitment Therapy (see Wilson, Sandoz & Kitchens, 2010; Lundgren, Luoma, Dahl, Strosahl, & Melin, 2012; Sandoz & Anderson, 2015). Acceptance and Commitment

Therapy (Hayes, Strosahl, & Wilson, 2012) regards values as a fundamental element of its treatment model (Sandoz & Anderson, 2015), and there is reason to believe that ACT values procedures effectively motivate engagement in valued life endeavors.

Values in Acceptance and Commitment Therapy

Values are a core component of Acceptance and Commitment Therapy (ACT; Hayes, et al. 2012), a trans-diagnostic approach to psychological treatment that has demonstrated efficacy in the treatment of a variety of behavioral health and psychological problems, including depression, chronic pain, anxiety, substance use, and more (Gundy, Woidneck, Pratt, Christian, & Twohig, 2011; Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Öst, 2008; Powers, Vörding, & Emmelkamp, 2009). ACT targets a common root cause of many behavioral problems, experiential avoidance, defined as the attempt to alter the form or frequency of thoughts, emotions, and other experiences, even when doing so is not in the service of desired goals or important values (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996; Hayes et al., 2012).

The goal of ACT is to enable psychological flexibility, defined as the ability to adapt behavior as necessary, with openness to and awareness of the internal and external context, to live a life that is directed by one's personal values (Hayes et al., 2012). The psychological flexibility model of ACT (see Figure 1. ACT "Hexaflex" model) is simultaneously a model of psychotherapy, psychological health, and psychopathology. As such, assessing a client's strengths and weaknesses according to each core process can provide a functional conceptualization of the root of psychological suffering while simultaneously serving as a guide for psychotherapy intervention. In the psychological flexibility model, there are six core components—acceptance, defusion, present moment

awareness, self as context, committed action, and values—each theoretically linked to the intended outcome of ACT: increasing psychological flexibility. Each of the six components plays a critical role in the conceptualization and treatment of psychological problems and is closely connected to values work in ACT.

Acceptance is the ongoing voluntary process of choosing to take an open stance toward moment-to-moment experiences. It enables people to engage nonjudgmentally with private experiences, fostering a stance of openness and curiosity from which people can learn from their private experiences. Through acceptance, even uncomfortable experiences are available to be noticed, allowing for flexibility in responding to them in ways that facilitate

successful working (Hayes

et al., 2012). Choosing to

accept private experiences

instead of avoiding them

allows for a wider range of

valued action. For

example, a graduate

student writing an anxiety-

provoking research paper

can, by practicing

acceptance, notice that she

is anxious. She may also notice highly tempting thoughts about shutting off her computer

and taking a bath; she may start to feel great relief imagining this choice. Through

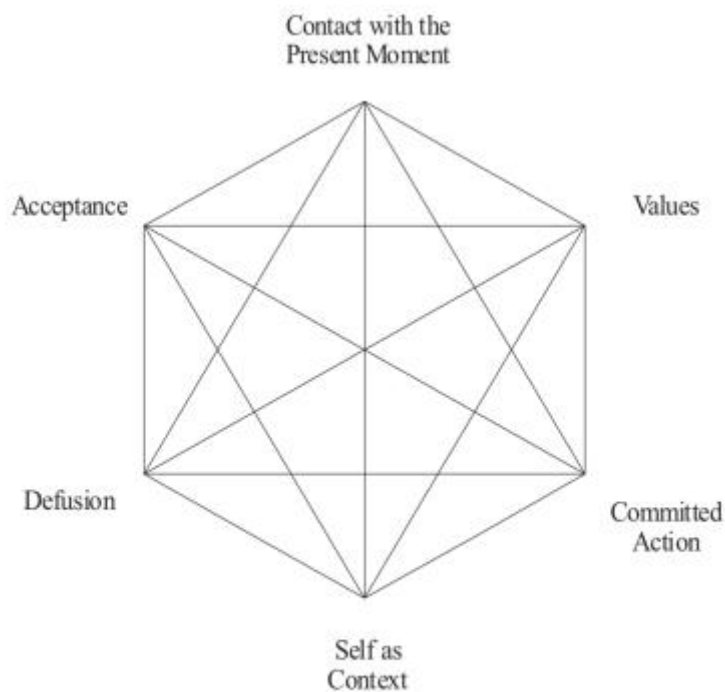


Figure 1. The ACT model: Hexaflex.

acceptance, however, the student is able to view this action as one of many from which she can choose, including uncomfortable actions that, while aversive, are consistent with her value of persistence. Consequently, she may choose to make the psychologically uncomfortable *and* values-oriented decision to persist in writing the paper (and taking the bath later).

Defusion is a process that undermines fusion, which can sometimes be unhelpful. Fusion is responding to thoughts not as verbal events, but as though they are real, in a literal sense. Fusion occurs through normal language processes in which language acquires the stimulus functions of the events and objects in the natural world that it symbolizes. In other words, functions in the natural world become fused with the functions of language. Consequently, behaviors can fall under control of verbal events to the extent that they exert greater control than direct experience. For example, fusion to the thought, “I am worthless,” could interfere with engagement in valued activities for which ‘worth’ is an inferred prerequisite, such as seeking a desired job promotion. Even with direct experience of ‘worthiness’ of the job position, fusion to “I am worthless,” could discourage attempts to achieve it. ACT works to facilitate defusion, which is the process of letting go of the literality of one’s cognitions, or detaching oneself from thought content. Clients are encouraged to examine the content of thoughts as ‘just thoughts’ and assess their workability (e.g., “I am having the thought, ‘I am worthless.’ What is this thought doing for me?”). In this way, defusion helps clients gain greater control of the stimulus functions of language through reducing attachment to verbal events as literal truth (Hayes et al., 2001; Hayes et al., 2012).

Present moment awareness involves the intentional allocation of attention toward

thoughts, emotions, and/or sensations in the present moment. In order to accept experiences and defuse from cognitions as they occur, individuals must be mentally present to what is occurring. Many individuals spend a significant amount of time engaging in thoughts about the past and the future, as when worrying or ruminating. From an ACT perspective, the past and the future consist of memories, stories, or constructions that occur in the present moment. Direct experience of the past or the future is impossible, and thus paying too much attention to these cognitive experiences and failing to notice that one is remembering or imagining in the present moment can detract from direct experience of the present context. Present moment awareness enables people to observe their experiences as they happen and notice their behavior in the context of ongoing events, thus increasing flexibility in choosing how to respond, as necessary, in the service of values (Hayes et al., 2012).

Self as context is a sense of the ongoing consciousness that is merely observing, rather than interacting with, life's events. It is a sense of the self as a context for the multitude of life's events and experiences to occur, including thoughts and sensations. Self as context can be experienced as transcendent, or spiritual. Another dimension of the self, the conceptualized self or self as content, is the sense of self we may tell others about, and it is the sense of self we generally tell to ourselves. This conceptualized self is likely to involve an account of one's history and tendencies that is coherent and makes sense. This verbally constructed self can include positive (e.g., "I am generally a good person") and negative (e.g., "I am a bad person") beliefs about the self. People typically hold tightly to these verbal senses of themselves because self-concept is at the center of the many reasons we construct for our behaviors. For example, imagine an instance in

which an individual says, “I am an honest person.” After making this statement, this individual is witnessed stealing from a store. As a result of making a statement that did not reflect his behavior, this individual may be told he was ‘not an honest person.’ Being ‘wrong’ is an aversive experience associated with ‘bad.’ At the same time, the social environment also reinforces a rigid sense of self by demanding and accepting “sensible” and “accurate” reasons for behavior. For example, explaining, “I only stole food to eat. I forgot my lunch today. I’m usually honest,” would likely be accepted as an explanation that made sense, although opinions may vary on whether it was a ‘sufficient’ or socially-sanctioned reason. Reason-giving is socially reinforced in this way. In the construction of reasons for behavior, the conceptualized self is an important point of reference both for the constructor and the verbal audience, and as such it can be highly resistant to change (Hayes et al., 2001). Fusion to self-conceptualizations can lead to restricted behavioral repertoires as we strive to affirm these identities to ourselves and the social world. For example, if a person has fused with being ‘smart,’ they may be unwilling to identify opportunities for growth in knowledge or to seek out further knowledge. If they are fused with being ‘stupid,’ they may avoid challenges, or conversely, they may tirelessly work to stave off this thought by directing activity toward success. Fusion to the conceptualized self can also lead to self-deception. For instance, if a person has fused with the self-concept of being a kind person, they may not be willing to observe themselves being cruel, even when their behavior is indeed harmful to others. By orienting to the self as context, it is possible to connect with a personal sense of wholeness and ongoing presence. This helps individuals to identify with a sense of self that is not threatened by life’s events and behaviors—one that is open and flexible to

approach and respond to situations as needed (Hayes et al., 2012).

Values bring individuals into contact with what matters most to them and are considered the motivational component of ACT. From an ACT perspective, values orient people toward engagement with important life consequences, verbally establishing reinforcement for values-consistent actions (Hayes et al., 2012). The mere verbal behavior of stating what one values may increase motivation to behave in ways that are consistent with them, and consistent engagement in values-oriented behaviors is considered the cornerstone in a “life worth living.” Values, from an ACT perspective, can be defined more comprehensively as “...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” (Wilson & DuFrene, 2009, p.66).

ACT therapists emphasize the importance of “choice” in values. When values are “freely chosen,” they are not under the aversive control of others’ desires and preferences. Choosing values only to please (or displease) the therapist, friends, or even the larger culture, can lead to less flexible behavior by diverting attention away from the experience of engaging in valued action and instead toward rigidly following a rule (e.g., “graduate college, or else mom and dad will feel disappointed”). In contrast, direct exposure to naturally reinforcing consequences is believed to sustain motivation to engage in valued behavior. Having “free choice” of values is important because it brings individuals in contact with the personal experience of engaging in valued actions, allowing for more flexibility in values-based actions.

While other processes such as acceptance, defusion, present-moment awareness,

and self as context are useful processes in sustaining valued engagement, direct training of these processes is not always necessary for behavior change; in some cases, the motivation to change (or persist in) behavior that is associated with identifying values is entirely sufficient. In treatment, ACT therapists encourage the identification of values, orienting clients to what matters most to them in the service of making positive behavioral changes (Yadavia & Hayes, 2009).

Committed action is real-life effective engagement with meaningful life values. Through engagement in effective, values-oriented actions, potentially harmful behaviors such as inaction, impulsivity, and avoidant persistence are undermined. Committed action is considered the ACT component that produces psychological health by bringing clients into contact with their values. Through valued engagement, a sense of vitality, connectedness, health, and wellbeing is accessible (Hayes, Levin, Plumb-Villardaga, Villate, & Pistorello, 2013; Hayes et al., 2012).

Evidence for ACT Values

Studies on the effects of ACT values procedures have demonstrated that values procedures increase engagement in values-oriented behaviors, and that when added to other interventions and ACT core processes, they can improve treatment outcomes. Páez-Blarrina et al. (2008a) demonstrated that a brief ACT values protocol substantially increased participants' willingness to endure painful shocks above the suppression control and untrained groups. In this study, seven out of ten participants in the ACT values condition (70%) tolerated the maximum amount of pain, compared to one out of ten in the suppression condition (10%) and two out of ten (20%) in the untrained condition. As a second part of the task, individuals who did not tolerate the maximum

amount of shocks in the first task proceeded to receive either an active training of defusion or suppression, or continued with no additional training. Participants then proceeded to a second pain task that was identical to the first. Of the three remaining ACT group participants that proceeded to the second pain task, two participants tolerated the maximum amount of pain (66.7%) compared to two out of nine in the suppression group (22.2%) and zero out of eight in the untrained group.

In a study that examined the effectiveness of an ACT-based online values intervention for undergraduate academic performance (Chase et al., 2013), researchers compared the grades of students randomized into one of three groups: goal-setting training alone, goal-setting training plus a values intervention, or a waitlist control group. The goal-setting condition, provided to both experimental conditions, educated participants about the importance of goal-setting and how to set challenging goals that are specific, measurable, attainable, realistic, and time-oriented (SMART). Participants were then prompted to set long-term, intermediate, and proximal SMART goals. Then, they were asked to list obstacles to goal achievement as well as solutions. Participants were also asked why the goal was important to them and what were the potential benefits of achieving the goal. In the goal-setting plus values intervention, participants first received an academic values intervention prior to the goal-setting program. This intervention provided participants with a definition of values from an ACT perspective and distinguished them from goals. Then, participants were guided in values identification exercises and metaphors that helped clarify the ACT conceptualization of values (e.g., comparing valued engagement to moving in a direction on a road map). Lastly, participants were asked to write for several minutes about important academic values.

Data on cumulative grade point average were collected at pre (beginning of the semester), post (end of the semester), and follow-up (end of the subsequent semester). Findings showed that the values plus goal-setting training significantly improved GPA from pre- to post-intervention, above the goal-setting alone group and waitlist control, with small ($d = .41$) and medium ($d = .63$) effect sizes, respectively. The goal-setting alone condition had no effect on GPA, nor did waitlist condition. However, after the waitlist control later received the goal-setting plus values intervention, GPA was significantly improved, with a medium effect size ($d = .51$). At follow-up, the goal-setting plus values group deteriorated slightly, although this was not significant either within condition ($p = .13$) or in comparison to the goal-setting alone group ($p = .20$).

Other studies have investigated the additive contribution of personalized values procedures to ACT interventions and have demonstrated that values, combined with other active ACT components such as acceptance and/or defusion, improves outcomes of pain tolerance (Branstetter-Rost, Cushing, & Douleh, 2009; Páez-Blarrina et al., 2008b) and pain believability (Páez-Blarrina et al., 2008b). One study of ACT for epilepsy (Lundgren, Dahl, & Hayes, 2008) showed that values attainment and persistence in valued action in the face of barriers significantly mediated changes in the duration of epileptic seizures, ratings of quality of life, and ratings of personal well-being, from pre-assessment to one-year follow-up. This evidence suggests that ACT values procedures have the potential to influence engagement in important life activities.

Finally, a study by Gloster and colleagues (2017) demonstrated that increased engagement in valued activities led to decreases in suffering for individuals with anxiety. In this study, 41 patients diagnosed with panic disorder and/or agoraphobia who were

resistant to previous evidence-based treatments were randomized to either active treatment or waitlist control. Treatment consisted of 8 (91 to 120-minute) sessions of ACT. At every session, participants' self-rated engagement in valued action and experiences of suffering and struggling were measured, along with other treatment-relevant factors. To assess valued action, they were asked, "How much have you engaged in behaviors that are in accord with your values and goals?" To assess struggling, participants were asked, "In the last 24 h, how much effort did you put into making anxiety-related feelings or thoughts go away (e.g., by suppressing them; distracting yourself; reassuring yourself or seeking reassurance from someone else?" Lastly, to assess suffering, participants were asked, "In the last 24 h, how upset and distressed over anxiety were you?" Results revealed that increased engagement in valued action preceded reductions in suffering and that changes in valued action were independent of experiences of struggle.

Mechanisms of Values-Related Behavior Change

A theoretical account of the mechanisms of values-related behavior change processes can be provided by Relational Frame Theory, a behavioral theory of language cognition, and the basic science foundation of ACT (RFT; Hayes, Barnes-Holmes, & Roche, 2001). From an RFT perspective, values are important vehicles for behavior change.

Relational Frame Theory

Relational Frame Theory was first proposed in 1985 and (RFT; Hayes et al., 2001) has contributed substantially to the empirical literature in a relatively short amount of time, with over 60 published empirical papers on RFT principles before 2010

(Dymond, May, Munnely, & Hoon, 2010). RFT provides a comprehensive psychological and behavioral analytic account of language and higher cognition (Hayes Strosahl, & Wilson, 2012) and has been applied in domains outside of ACT, including special education (Rehfeldt & Barnes-Holmes, 2001), and for psychotherapy in general (Törneke, 2010). Instead of examining the products of language (e.g. the structure and content of language) as is performed in the field of linguistics, RFT examines the activity of language and cognition. RFT is also the basic science theory that serves as the foundation for ACT therapy, and it provides a comprehensive account of the process by which ACT values procedures can lead to valued life engagement (Hayes, Barnes-Holmes, & Roche, 2001).

Values are considered verbal behaviors, or arbitrarily applicable relational responding (AARR). According to RFT, verbal behaviors include both the learned acts of relating objects and concepts in arbitrarily applicable ways that are symbolic as well as responding to these relations (Hayes et al., 2001). The term, arbitrarily applicable, means that the behavior of relating is not based on any formal properties in the physical world, and thus, the nature of relations between concepts and objects can be changed based solely on the desires or preferences of the verbal community.

Three features characterize AARR and are the basic components of RFT: mutual entailment, combinatorial entailment, and transformation of stimulus functions. Mutual entailment describes the behavior of relating stimulus B to stimulus A when only the relationship of A to B was directly trained. In other words, training a relationship between A and B entails a relationship in the opposite direction, between B and A. For example, if I teach a person that the words ‘bloop’ and ‘lime’ are functionally equivalent,

that person may derive the reverse relationship: that ‘lime’ is functionally equivalent to ‘bloop.’ Combinatorial entailment involves relating stimulus A to C when only the relationships of A to B and B to C were directly trained. These three steps can be illustrated with the following example. Suppose I trained a person that the words ‘bloop’ and ‘lime’ have equivalent functions. Next, I train that the spoken word ‘lime’ represents an actual lime. Without training, verbal beings will derive from those two relationships an additional relationship between the physical lime and the word ‘bloop’. This is combinatorial entailment. A verbal being will know that the lime and the ‘bloop’ are related despite having never been directly trained in this relationship. Lastly, transformation of stimulus functions describes how ‘bloop’ now acquires functions of ‘lime’ and the physical object of a lime. In fact, on mere presentation of the word ‘bloop,’ previously conditioned responses to tasting an actual lime, such as salivation or puckering, may occur (Hayes et al., 2001; Hayes, Strosahl, & Wilson, 2012).

A specific class of an AARR is a relational frame, which is a unit of relational responding, and involves relations of concepts (e.g., frames of sameness, similarity, opposition, temporal situation, causality, etc.). As there are many ways in which stimulus events may be related, there are also many specific kinds of frames. Mutual entailment, combinatorial entailment, and the transformation of stimulus function are properties of a relational frame (Hayes, et al., 2001). For example, the use of the word “apple” may participate in a relational frame of similarity with “pear” and other specific fruits. In this way, arbitrary words become related to non-arbitrary stimuli in the environment and come to elicit behavioral responses that resemble responses to actual physical stimuli (as in the example of the ‘bloop’ and the lime).

Through this process, new behaviors can become reinforced through the construction of verbal statements alone, without any direct experience with the non-verbal consequences of such a behavior. For example, “Dirty water is not drinking water,” could prevent a person from drinking water with a crumb floating in it, even if a person has never directly experienced consequences from drinking “dirty” water. Refusing to drink the water would be an example of rule-governed behavior, which is behavior that is under the control of verbal statements as opposed to direct experience of contingencies (Hayes et al., 1986).

Values as Rule-Governed Behavior. As words become associated with objects and occurrences and relations are trained and derived between them, the verbal construction of future events that have never been directly trained also becomes possible. This can allow for what we might call “imagining,” or future thinking. This is the process by which goals and values can be constructed. While goals and values are concepts that have commonalities, there are important differences between them. According to RFT, goals are terminal and can be reached, whereas values are ongoing and do not have a specified endpoint. Values are “...verbally-constructed, globally-desired life directions. Values manifest themselves over time and unfold as an ongoing process rather than an outcome” (Hayes et al., 2001, p. 235).

Values work in therapy is believed to work by augmenting a client’s motivation¹ to engage in values-oriented behaviors, increasing the likelihood for values engagement.

Augmenting is rule-governed behavior that changes the extent to which an event will

¹ From an RFT perspective, motivation does not refer to the process of going from a passive unmotivated state to an active or motivated state. In the current paper, the term “motivation,” refers to a process by which related actions that have been previously reinforced temporarily acquire additional reinforcing properties.

function as a consequence. It provides verbally-formulated incentives for engaging in particular behaviors and explains the process by which values identification and clarification can motivate behavior. There are two subtypes of augmenting: formative and motivative. Formative augmentals establish new consequences (Hayes et al., 2012). For instance, imagine an individual stating that she values physical health. She then learns about a food she has never tried, kale, that has been called “healthy.” Learning that eating kale is related to her value of physical health may thus establish reinforcement for eating it. Motivative augmentals temporarily alter the reinforcement for behaviors for which a history of reinforcement exists. Having a history of engagement in behaviors, particularly those with reinforcing or punishing consequences, allows the sensory and perceptual consequences of engaging in those actions to be brought to awareness when merely speaking about them or thinking of them (Hayes et al., 2001). For example, asking an individual to explain why they value their relationship with their spouse gives rise to the consequences of doing just that (e.g., feeling happy, feeling connected to the spouse) in the present moment via the transformation of stimulus functions. This process is associated with the augmentation of reinforcement for engaging in instrumental behavior associated with spending time with the spouse. In other words, as a result of thinking about or talking about values, values-oriented behaviors that have been reinforced in the past become temporarily more reinforcing. In RFT, the behavior of clarifying one’s values also involves motivative augmenting, or “...behavior due to relational networks that temporarily alters the degree to which previously established consequences function as reinforcers or punishers...” (Hayes et al., 2001, p. 109). In this way, values clarification can be understood as a motivational procedure in treatment.

Pliance is one potential factor that can undermine the motivational power of values work in therapy. *Pliance* is rule-governed behavior based on a history of socially-mediated reinforcement for following a rule (Hayes et al., 1986). It involves engaging in behaviors to achieve some social consequence (e.g., to please or displease someone else). An example would be a woman who reports valuing her career, not because she feels it is personally meaningful—she feels trapped and uninterested—but because her family would be disappointed if she changed careers. Pliance can become problematic as behaviors come under the control of others' desires and opinions (e.g., the therapist, the wider culture, etc.), decreasing sensitivity to consequences in the natural environment. A potential pitfall of pliance is that it can reduce flexibility in behavior, as reinforcement is solely derived from following a socially-mediated rule that, by its very nature, is concrete and unchanging (Hayes, Barnes-Holmes, & Roche, 2001). Behaviors may persist despite direct experience of harmful consequences, potentially leading to suffering. In contrast, engaging in values-oriented behaviors that are intrinsically reinforcing and not directed toward pleasing or displeasing others allows individuals to gain direct experience with the changing environment and associated consequences for behavior. As such, valued actions allow for flexible adjustments of behavior and more access to reinforcers. For example, "You should regularly visit sick relatives," as a rule, could lead someone to visit a sick relative even when this relative does not want to be visited. The consequence of pliance often involves experiencing more frequent aversive consequences, and feeling trapped in such a pattern. In comparison, valuing kind and loving treatment of family members may lead an individual to initially visit a sick relative to express care, yet upon learning of the relative's preference to be left alone, may consider fewer visitations. This

values-oriented behavior of visiting less in service of values would be considered tracking. Tracking is rule-governed behavior that, compared to pliance, allows for greater access to a variety of reinforcement contingencies by increasing opportunities for flexible behavior.

Coherence. One basic assumption of RFT is coherence, or sense making. It is believed that language-able humans engage in AARR in ways that are coherent, or make sense, because it has been reinforced previously, and this reinforcement has generalized such that maintaining coherent relational networks is reinforcing in the absence of external reinforcement. Under a host of different terms, the human behavior of sense making has been substantially discussed and observed in the psychological literature (see Bordlieri, 2013).

Coherence can be described as “inherently,” “intrinsically,” or “automatically” reinforcing, meaning that in the absence of external reinforcement for behaviors, a preference is still shown toward alignment of verbal behavior in ways that make sense. This is not to suggest that the reinforcing properties of coherence were not learned (Hayes et al., 2001). According to RFT, the preference for coherence is learned through behavioral contingencies in the verbal community as well as the natural environment. The verbal community, consisting of the many people that may interact verbally with an individual, reliably reinforces verbal behavior that is sensible and accurate (Hayes et al., 2001). In addition to the social environment, the natural environment also reinforces verbal sense making. Driving safely involves following verbal rules that make sense. “Don’t speed, or else...” protects the driver from aversive consequences such as deadly accidents or speeding tickets that may never have been directly experienced. In this case,

making the reasonable decision to drive safely will be reinforced as the driver avoids accidents and speeding tickets. The social and natural contexts also punish inconsistency. For example, if an individual is asked why she slept late and replied, “It’s because I like muffins,” not only is it unlikely that such a response would be reinforced, but it is highly likely that it would be punished.

Another form of making sense involves the composition of our self-conceptualizations. Inconsistency between what a person says and what a person does in a social context typically results in unfavorable social consequences. Being called a ‘hypocrite,’ or ‘two-faced,’ are painful social consequences, and this is true even when the person waging these insults is oneself. Personal awareness of inconsistency alone can bring about emotional discomfort through the transformation of stimulus functions in which the words themselves carry the function of the social castigation that can accompany them. This aversive feeling that accompanies incoherence has been well documented in the social psychology literature as a state of tension, or an unsettled feeling that often coincides with noticing a discrepancy between behaviors and beliefs or attitudes (Harmon-Jones, Amodio, & Harmon-Jones, 2009).

Making sense is a fundamental component of verbal behavior. Over time, coherence, having been reliably reinforced across multiple social and natural contexts, generalizes to contexts in which it was not directly trained (Hayes et al., 2001). In terms of values, “I value healthy living,” and “I smoke,” may seem incoherent to the individual who has learned that smoking is not healthy. Having made these two statements, coherence may be regained with, “I will quit smoking,” and eventually, “I have quit smoking.” It can also be achieved with, “I don’t value healthy living all that much.”

Despite strong empirical support for the basic tenets of RFT (Dymond et al., 2010), there is limited support within the RFT literature for the concept of coherence. However, preliminary evidence exists for the reinforcing properties of coherence (Bordlieri, 2013; Wray, Dougher, Hamilton, & Guinther, 2012). Wray et al. (2012) demonstrated that individuals preferred solvable tasks to unsolvable tasks despite equivalent feedback for engaging in each of the tasks. Others have found that in the absence of experimentally programmed contingencies or instructions, individuals responded to stimuli in ways that were coherent and internally consistent (Bordlieri, 2013; Harrison & Green, 1990). Evidence also exists from other research domains that support the concept of coherence, showing that individuals have a preference for consistent self-conceptualizations.

Social Psychological Studies of Coherence and Values

Scientific evidence across theoretical domains and over the course of several decades also has confirmed that exploring and identifying one's personal values can affect behavior and motivation (see Freijy & Kothe, 2013; Epton et al., 2014; Harris & Epton, 2009; Pezza, 1991; Levin, Hildebrandt, Lillis, & Hayes, 2012; Rokeach & McLellan, 1972). Many of these studies come from the social psychology literature, and particularly from studies on cognitive dissonance. Cognitive dissonance has been defined as the sense of distress experienced when individuals become aware of inconsistencies between beliefs, values, attitudes, and/or behaviors (Festinger, 1957). There are over 1,000 studies supporting the principle of cognitive dissonance, showing that when individuals become aware that their behavior is inconsistent with their attitudes, they are likely to adjust attitudes or behaviors (Tavris & Aronson, 2015; Stone, 2012). These

findings are in accordance with an RFT account of coherence: when encountered with inconsistencies between attitudes, beliefs, values, behaviors, and any combination of these, individuals are compelled to restore consistency between them. Attempts to restore consistency typically involve changing part of the relational network, such as a belief, value, attitude or behavior. However, this does not always occur. Using self-report measures, several studies have indicated that the experience of cognitive dissonance is aversive (for a review, see Harmon-Jones, Amodio, & Harmon-Jones, 2009) and that cognitive dissonance can be measured physiologically as arousal (Croyle & Cooper, 1983). However, by escaping the tension associated with dissonance (or incoherence), individuals can avoid aversive feelings. Distraction, consuming alcohol, misattributing discomfort to a different source, trivializing the importance of a discrepant act, denying responsibility for one's behavior, and focusing on unrelated positive attributes can reduce dissonance-based discomfort (Stone, 2012). These studies demonstrated that incoherence can lead to a variety of different behavioral responses.

Specific experimental procedures used to induce dissonance have also been shown to influence the behavioral means by which people attempt to resolve it (e.g., by changing values, changing behaviors, changing attitudes, avoiding, etc). Evidence suggests that in dissonance-based hypocrisy paradigms in which individuals advocate for certain values or beliefs and are then reminded of past value-behavior inconsistencies, people are more likely to reduce dissonance by adapting their behaviors (Freijy & Kothe, 2013; Stone & Fernandez, 2008). Hypocrisy paradigms are effective agents for both non-health and health-related changes in attitudes and behavior (Freijy & Kothe, 2013; Stone & Fernandez, 2008). In one famous study of a hypocrisy paradigm by Aronson and Stone

(1991) students were first asked to disclose their personal neglect of condom use and were then asked to make a statement persuading others to use condoms. Relative to the control condition, participants in the hypocrisy group were more likely to express intent to improve condom use in the future.

In another study (Kantola, Syme, & Campbell, 1984), researchers recruited homeowners who expressed positive attitudes toward electricity conservation and agreed to have their electricity usage monitored for two weeks; a baseline measure of energy consumption was taken. Participants were then randomly assigned to one of four conditions: dissonance plus feedback plus conservation tips, feedback plus conservation tips, tips only, and lastly control. All experimental groups received tips for energy conservation. The dissonance group received letters in the mail reminding them that they had previously said they believed in conservation and that their energy use was high. The feedback group was only told that their usage was high. The tips only group received only the energy conservation tips. The control group was sent a thank you note for participating in the study. Energy consumption was recorded at two and four weeks. Results showed that participants in the dissonance condition used significantly less electricity compared to all conditions at two weeks. At four weeks, energy usage in the dissonance group was only significantly lower than the control group. Aitken, McMahon, Wearing, and Finlayson (1994) conducted a similar study in which participants were reminded of their concern for water conservation after being told that their water consumption was high. Participants in the dissonance condition conserved more water over the seven-week follow up than those in the control condition.

Another classic dissonance-based values procedure is Rokeach's values self-

confrontation method of behavior change (Rokeach, 1973). In this procedure, a person is first asked to rank order his or her values in order of importance. Then, the researcher informs the respondent about how their value priorities compared to both a negative reference group and a positive reference group. For example, a person may feel that being tolerant is consistent with his morality. After ranking values and placing the value of freedom above the value of equality, a researcher informs the individual that this specific value prioritization of freedom above equality resembles the value pattern of “bigots.” Next, the individual is provided with a list of value priorities that are consistent with individuals who are more “tolerant.” It is believed that in this procedure, providing information about a person’s value profile that conflicts with his or her ideal self-image creates dissonance. In response to this dissonance induction, individuals are then asked to re-order their values to align their priorities with those of the reference group that reflects their values. It is believed that individuals then modify values-related attitudes to conform to the new prioritization, and lastly, this will lead to changes in behaviors. In the example above, Rokeach assumed that reordering values such that equality was ranked higher than freedom should lead to changes in attitudes toward civil rights and voting behaviors (as cited in Schwartz & Inbar-Saban, 1988). While there have been several studies to show that the values self-confrontation procedures indeed work in changing behaviors (Greenstein, 1976; Grube, Mayton, & Ball-Rokeach, 1994; Schwartz & Inbar-Saban, 1988), the theoretically proposed mechanism of change, alterations in value priorities, has not been empirically demonstrated (Grube, Greenstein, Rankin, & Keaney, 1982; Schwartz & Inbar-Saban, 1988).

ACT Values Procedures

In ACT, therapists help clients identify and clarify their values, focusing clients toward valued patterns of engagement as an alternative to experiential avoidance. ACT assumes that all clients have the potential to connect with what is meaningful in their lives, and yet it can be difficult to have a clear sense of what is meaningful when fusion to thoughts and experiential avoidance lead people in contradictory directions. For instance, it is difficult to engage in behavior that is oriented toward the value of fostering close relationships while also avoiding emotional discomfort. In part, this is true because relationships typically require empathy, or contact with the range of others' emotional experiences, and not just the comfortable ones. However, even if empathy can be avoided, the mere act of fostering relationships introduces the pain of losing the loved one as a result of the relationship ending, due to conflict or death, not to mention the pain of imagining this loss. In this way, when behavior is oriented toward a goal of emotional control, committed engagement with valued life activities becomes nearly impossible. To increase valued engagement, ACT guides clients through the identification and clarification of chosen values that can motivate valued behaviors, even when doing so involves psychological pain (Hayes et al., 2012).

Methods for Values Identification

ACT researchers and clinicians have developed several methods for identifying values for utilization in both research and practice. These assessments involve helping the client to identify the importance of several personal values domains. While there is no single recommended way to clarify values in ACT, common patterns have emerged within the ACT tradition. Values identification, in therapy, involves the assessment of patterns and qualities of actions in life domains that are important. During values

assessment, ACT clinicians also monitor carefully for pliance, often iterating to clients that values are freely chosen and do not function to please others or to avoid punishment. Values are chosen because they are personally meaningful.

A popular and additional step to the process of identification and clarification of values has also been used in treatment. This step involves bringing clients' attention to how consistently their behaviors have reflected the importance of their values within a recent period of time (e.g., one week). For example, one popular clinical technique used in ACT is the Valued Living Questionnaire (VLQ, Wilson et al., 2010), a self-report questionnaire in which respondents rank the importance of specified value domains (e.g., family, religion, career, etc.) and are subsequently asked to rank how consistently their behaviors have aligned with their values over the past week. Another ACT exercise, the Bulls-Eye Values Survey (Lundgren et al., 2012), involves a drawing of a Bulls-Eye in which the center of the target represents a client's identified value. Clients are then asked to place a mark on the drawing to indicate how "on target" behavior has been with the value—greater consistency between values and behaviors will result in marks closer to the center of the Bulls-Eye. In this exercise, clients are then asked to mark on another Bulls-Eye how often they persist in values-related behaviors despite obstacles; the center of the Bulls-Eye, in this case, represents persistence despite all obstacles. In each of these procedures, a lack of connection between values and past behaviors is brought to attention. While empirical evidence has supported the theoretical position that identification and clarification of values can lead to behavior change, one question that has not been investigated, within the ACT literature, is whether the procedure of bringing

awareness to a lack of connection between values and behaviors could further affect motivation to engage in values-consistent behaviors.

Consideration of Procedural Effects

In the case of values procedures that bring clients into contact with values-behavior inconsistencies, the RFT principle of coherence may be relevant to behavioral outcome. The auxiliary procedure of having people rate values-behavior consistency brings client awareness to inconsistencies between the conceptualized self and recent behaviors. Whereas the basic procedure of identifying and clarifying values may produce various feelings including the positive experience of imagining valued engagement, the added procedure of rating values-behavior consistency introduces incoherence. With incoherence, individuals experience a state of emotional discomfort that has generalized from historical instances in which incoherence was met with social punishment. For this reason, values procedures with and without an assessment of values-behavior consistency may work differentially for individuals depending on their level of attachment to negative self-concepts, as well as experiential avoidance and psychological flexibility.

Fusion to Negative Self-Concepts. Having an overly negative and/or rigid self-concept may affect the way clients respond to values work (Hayes, Strosahl, & Wilson, 2012). Upon becoming aware of inconsistency between how much one values something and how little they have been engaging in valued behaviors, an individual is likely to re-establish a coherent conceptualized self in one of two ways: by re-establishing coherence via thoughts (verbal behavior) or overt behavior. The first pathway to re-establishing coherence involves relating this information to negative thoughts, such as “I don’t do what I say I will do,” or, “I’m bad,” or “I can’t do this.” Individuals with a more rigid and

negative self-concept, upon noticing value/behavior inconsistencies, can regain coherence by relating the discrepancy to rigid and negative aspects of the conceptualized self. Thus, the individual's focus has shifted away from changing behavior (e.g., spending more time with family) and coherence is instead achieved by relating this information to a negative thought about the self. For example, "I won't spend more time with family because I'm selfish," or "I'm a bad person." In this way, coherence, with a long history of reinforcement across multiple contexts, is likely to be sought despite the aversive experience of identifying painful thoughts about oneself.

Conversely, it would be expected that an individual with a flexible and/or more positive self-concept would, in response to becoming aware of inconsistency between values and behaviors, proceed to regain coherence by changing behavior. As the believability of negative self-concepts is doubted, the ability to regain coherence by identifying with one's self-concept is undermined. This leaves two possibilities for achieving coherence: altering the degree to which one cares about a value or changing one's behaviors. Provided the extensive history of reinforcement associated with one's personal values, it is unlikely, although not impossible, that the importance of the value itself will change. Changing behavior in respect to values does not require alteration to the relational network, which is relatively resistant to change.

Experiential Avoidance/Psychological Flexibility. Becoming aware of inconsistencies between one's behavior and their self-conceptualization is likely to evoke emotional discomfort. One response to this discomfort would be experiential avoidance, which can take the form of suppressing discomfort, shifting attention away from the emotions through distraction, or engaging in a number of other strategies to avoid the

aversive experience. When experiencing the discomfort of incoherence, individuals who are high in emotional avoidance would be likely to use distraction, thought suppression, or other avoidance techniques to avoid or escape the emotional discomfort (Stone, 2012). For individuals high in experiential avoidance, values procedures that highlight incoherence may temporarily result in less engagement in the task and/or emotional dysregulation, and thus individuals high in experiential avoidance may also be less likely to orient to change behaviors. Conversely, individuals who are more accepting of emotional experience may be more likely to engage in behavior change to re-establish coherence. For individuals who are open to experiencing emotions and have flexible or/and positive self-concepts, incoherence may be experienced as a signal to do something about the problem, thus increasing the likelihood of behavior change.

Overview and Purpose

To date, there are no known studies of the behavioral effects of adding a values-behavior consistency procedure to standard values identification and clarification procedures. There is reason to believe that this adjunctive procedure could increase the likelihood of engagement in values-oriented behaviors, and that the effectiveness of procedures may also vary according to the degree to which people rely on experiential avoidance for coping with emotional discomfort and how fused people are to negative self-conceptualizations.

The following study was a T1 translational study. Translational studies involve research for which scientific findings are applicable to clinical practice with clients. In other words, translational research findings bear directly on practical application, moving findings from “bench to bedside” (Rubio et al., 2010, p. 4). T1 translational research,

more specifically, is basic research aimed at informing clinical practice (Rubio et al., 2010). Findings from the proposed study may be used to inform the utility of specific ACT values clarification practices in treatment.

The present research had three main goals. The first was to determine whether values exercises, in general, perform their intended function in ACT: to increase engagement in values-related behavior change. The second goal was to determine the effectiveness of adding values-behavior consistency procedures to a standard values clarification procedure. Lastly, I wanted to examine whether experiential avoidance and fusion to negative self-concepts moderate the effectiveness of approaches to values-clarification.

Hypotheses

1. A values procedure with an added assessment of values-behavior consistency would be associated with increased engagement in values-oriented behavior compared to a basic values procedure, whereas both values procedures would be more effective than an attentional control condition.
2. The relative effectiveness of the two values procedures would depend on levels of experiential avoidance and fusion to negative self-concepts. Values with behavioral values-behavior consistency assessment procedures would be expected to increase values-oriented behaviors for individuals who have lower experiential avoidance and less fusion to negative self-concepts, whereas a basic values clarification procedure would be expected to increase values-oriented behaviors for individuals who have higher experiential avoidance and more fusion to negative self-concepts.

3. In an exploratory analysis, I would examine the role of changes in affect from pre- to post-values interventions in motivating values-oriented behaviors.

Method

Eligibility Screen

Individuals who elected to participate were administered an initial screening assessment of age eligibility, appropriateness of the electronic device participants were using, the noise level in the workers' environment, and an attention check item. Participants were compensated \$.05 for completing the screening portion of the study.

Participants

Participants were 356 adult Amazon Mechanical Turk (MTurk) workers. Amazon MTurk is an online crowdsourcing platform where people can elect to perform tasks, called Human Intelligence Tasks (HITs), and earn money for their work. Buhrmester and colleagues (2011) showed that data obtained in social science studies on Amazon MTurk were at least as reliable as data obtained using traditional in-person study procedures. Adding to these findings, Hauser & Schwartz (2016) found that MTurkers paid closer attention to study instructions compared to college student populations. For this study, I recruited only MTurk workers that were working within the United States and who had a 98% or higher HIT approval rating, meaning that 98% or more of their work had been approved by employers (HIT requesters). Participants were compensated \$.05 for completing the initial screening portion of the study (N = 356). Individuals that passed the screen had to be 18 years old or older, participating from a laptop or desktop computer, working in an environment with no more than light noise, and accurately respond to the attention check item. Those who were eligible to participate in the

remainder of the study ($N = 314$) had the opportunity to earn an additional \$2.95 for completing at least 95% of all study items and providing accurate, effortful responses to items as measured by attention check items and visual inspection of the experimental writing portion of the study. Two workers were not paid for failing to meet minimum completion requirements.

Recruitment

The study advertisement (Appendix A) that was listed on MTurk was titled, “Psychological study on values and emotions; Earn up to \$3.00 if you qualify.” Prospective participants who chose to preview the HIT were presented with information about eligibility, compensation, the amount of time required to participate, and were warned that evidence of falsified or misleading data would lead to rejection of work. The ad also stated, “This study will involve several questions about your emotions, beliefs, and thoughts, and will also involve a task in which you will write continuously about a topic for a few minutes at a time.”

Procedure

See Figure 2 for an overview of the main study procedures. Participants were routed from the MTurk website to an online survey created in Qualtrics, an internet-based program for survey design and data collection. Participants first read the informed consent and were offered the opportunity to continue the study. Then, participants



Figure 2. Overview of Procedures and Study Flow.

completed the screening portion of the study. Those who met inclusion criteria then completed a measure of affect. Subsequently, participants were randomly assigned using block randomization to one of three dose-equivalent study conditions: an attentional control group, simple values procedure, or a values procedure with an added values-behavior consistency procedure. After completing the experimental portion of the study,

a second administration of the measure of affect was presented, followed by an opportunity to donate up to \$2.95 of their study earnings to one or more of 13 different charities. Following the donation opportunity, participants completed an assessment of fusion to negative self-statements, experiential avoidance, a post-participation survey, and then a demographic assessment. Participants were thanked for their participation.

Two attention check questions were inserted into the study with the aim of increasing the validity of obtained data. The first one assessed that participants read instructions to the writing portion of the study; participants were corrected if they failed this assessment and were assessed a second time for comprehension of writing instructions. The next attention check item was imbedded at the end of the second mood measure and asked participants to “leave blank.” These items served to further assess participant engagement, comprehension, and effort as these were important to the validity of findings. The placement of these items was aimed to prevent interference with the experimental task as well as minimize any influence on mood.

Materials

Demographics. To explore sample characteristics, I assessed participants’ gender, age, ethnic/racial identification, income, and education level (see Appendix B for demographic instrument).

Experiential Avoidance. The Acceptance and Action Questionnaire-II (AAQ-II; Bond et al., 2011) is a 7-item self-report inventory measuring the willingness to accept private events (e.g., emotions, thoughts, or sensations). In this study, it demonstrated excellent internal consistency ($\alpha = .94$). Scores are the sum of item responses; higher scores indicate greater experiential avoidance and/or psychological inflexibility, whereas

lower scores indicate greater experiential acceptance and/or psychological flexibility. Average total scale score in this sample was $M = 21.48$, $SD = 10.50$. The AAQ-II maintains a high correlation ($r = .97$) with the AAQ-I and has improved psychometric consistency over the original measure. It has demonstrated convergent and criterion-related validity (see Appendix C for AAQ-II).

Fusion to Negative Self-Thoughts. The Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980) is a 30-item questionnaire measuring the frequency and of automatic negative self-statements. It was revised by Zettle and Hayes (1986) to include a measure of the believability of thoughts (ATQ-B). In the ATQ-B, frequency and believability are scored separately by obtaining sums of responses to each. High scores for frequency indicate higher levels of negative automatic thoughts; high scores for believability indicate more attachment to negative self-statements. Hollon and Kendall (1980) previously reported excellent internal consistency ($\alpha = .97$) for this scale. In the current study, internal reliability for the ATQ-B was also excellent ($\alpha = .98$). with average scores of $M = 65.32$, $SD = 28.91$.

Negative Affect. The Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988) is a widely used 20-item measure of mood consisting of 10 positive and 10 negative affect items, each linked to a 5 point Likert scale. Reliability for both the positive and negative affect is good, with $\alpha = .86-.90$ and $\alpha = .84-.87$, respectively. The following items were added to the negative affect scale: disappointment, dissatisfaction, frustrated, embarrassed, fear, resentment, guilt, self-contempt, uneasiness, threatened (see Appendix E for PANAS with added items). In this

sample, internal consistency for pre-randomization negative affect ($\alpha = .95$), and post-randomization negative affect ($\alpha = .95$) were excellent.

Randomization to Conditions. Participants were randomly assigned using block randomization to one of three groups: Control, Values-Alone, and Values with Behavior-Consistency.

Control. An attentional control group is included in the experimental design and provides participants with similar duration and intensity of participation requirements as the experimental conditions, but without the procedural components that are hypothesized to be active. In this condition, participants responded to two prompts about time management. The first prompt (Appendix F) asked participants to choose a time management practice from a list of practices that are valued by society. The list included the following: staying organized; planning ahead; making commitments you can keep (not over-committing); keeping a schedule; working steadily toward deadlines; setting goals; keeping a routine, and maintaining work-life balance. They were then asked to write continuously about why the practice they selected from the list is valued and how people might implement it. Participants had 4 minutes in which to write their response. After 4 minutes, the questionnaire advanced to another page asking participants to choose another time management practice from the same list and write about why people value the second practice and how it can be implemented. After 4 minutes, the page automatically advanced.

Participants were then presented with the following item: “Please respond to each statement by rating how true each statement is for you according to your own personal sense of what is important about time management, on a scale of 1 (not at all true) to 7

(extremely true).” The list of items will contain the following: “It is important to be on time.” “It is important to have a set routine every day.” “I care about planning. “It is important to me to take on only as much as I can handle.”

Values-Along. Participants in the Values-Along condition (VA) were asked to write responses to two prompts. The first prompt (Appendix G) asked participants to select one of the following issues that “...moves you to want to take action and help people in that situation.” The list included the following possible selections: Hunger/famine, poverty, discrimination, disease, substance abuse, mental health problems, child abuse or neglect, and veteran’s issues. Participants were then asked to, “...tell us more about why this specific human issue matters to you. What you write may be personal, about people you know, or it may be general information about the issue. All of this is acceptable as long as it tells us why you care about this issue.” They were instructed to write continuously until the page advanced in 4 minutes. After 4 minutes, the page advanced to the next writing prompt.

The second writing prompt (Appendix H) asked participants to write about how they choose to express their care/concern for the human issues they feel are most important. The term ‘express’ is defined in the prompt as:

“...expressing through your actions. There are countless ways you may have already done this or would like to do this. For example, some people may express their care/concern about discrimination by working hard to treat people as equals and voting in ways that they believe reflect this concern. Another person who cares about colon cancer may create posts in social media that raise awareness about the disease.”

After 4 minutes, participants automatically advanced to the last section of the values condition (Appendix I) in which they were told the following:

“Below is a list of statements about actions that are often important to people that care about human issues, such as the issue you wrote about earlier. Please respond to each statement by rating how true each statement is for you according to your own personal sense of what is important, on a scale of 1 (Not At All True) to 7 (Extremely True).”

Statements included: “I care about getting involved in solutions to human problems,” “It is important to take care of people who are less fortunate,” “I care about giving to people who are in need,” and “It is important to me to try to make a difference in the lives of other people.”

Values with Behavior-Consistency. Participants in the Values with Behavior-Consistency (VBC) condition responded to the entire values procedure described in the Values condition with the exception of writing for only 3 minutes for each essay to account for equivalence in dosage of time between conditions. Participants in the VBC condition were then presented with the following (Appendix J):

“We just asked you about how you express your care and concern for human issues through your actions. Now we want you to reflect on your activities over the past week. In our daily lives, it is common to feel pulled in different directions. Most of us find that as much as we deeply care about other humans, the daily events that fill our lives often distract us from living the way we want to and doing what matters most. Sometimes we may forget how much we care about important human issues as we struggle under the weight of the many activities that fill our days.

On the last page you responded to statements about a range of behaviors such as being generous, caring for others, volunteering, and trying to make a difference. Here, take a moment to reflect deeply on how much you have engaged in these actions over the past week. How consistent were your actions with how much you care about each of the behaviors in the list? Please rate the degree to which over the past week your actions matched how important these behaviors are to you, from 1-7, with 1 being “my actions were not at all consistent with how important this is to me,” to 7 being, “my actions were very consistent with how important this is to me.”

Items included: “Getting involved in solutions to human problems,” “Taking care of people who are less fortunate,” “Giving to people who are in need,” and, “Trying to make a difference in the lives of other people.”

Dependent Variable

Participants were presented with an opportunity to give a portion of their earnings (i.e., \$0.00 to \$2.95) to charity (see Appendix K). Thirteen charities were provided, and participants were able to type in the amount of donation they wanted to offer to each charity.

Post-Participation Survey

Following the survey, the following questions about the participation experience were presented: “1. What do you think this study was about? 2. How did you feel about the donation opportunity? 3. Please tell us anything about your experience that you think the researchers should know, such as technical glitches, problems, etc.” Participants were able to enter free-response answers to these questions.

Results

Analytic Strategy and Data Screening

Prior to analysis, data was screened for validity and accuracy, missing values, and meeting the requisite assumptions of statistical analyses. Of the entire sample of MTurk workers that completed the study (N = 356), 314 participants passed the pre-screen and proceeded to participate in the remainder of the study. Of the remaining sample of 314 completers, 68 cases were excluded from analysis for the following reasons: accurately guessing the dependent variable in the study (n = 15); providing written feedback indicating doubt about the validity of the dependent variable (n = 12); evidence that the

same person participated twice ($n = 2$); failing one or more attention check items in the study ($n = 37$); failing to complete the writing portion of the study as instructed ($n = 1$); and failing to complete minimum participation requirements ($n = 1$).

Missing Data. Missing data was examined using a missing data analysis procedure available in Statistical Package for the Social Sciences (SPSS). Altogether, ten individuals had incomplete data. Of these individuals, four were missing one response to an item on the AAQ and six were missing one response to an item on the PANAS. These data points appeared to be missing at random. Given the low number of missing data points, list-wise deletion was used to manage missing data in this sample (10 cases removed; $N = 236$).

Outlier Analysis. I assessed for univariate outliers by inspecting box plots of independent variables and the dependent variable. There were univariate outliers observed for fusion, negative affect, and donation amount (see Appendices L, M, and N, and O for boxplots). However, no cases were removed, as outliers did not appear to be associated with measurement error or data entry error, and they appeared to reflect an accurate sampling of the true population.

I then assessed for multivariate outliers by using a common procedure of examining the following indices (Osborne & Overbay, 2008): standardized residuals, leverage, and Cooks D. Indices were visually examined and compared to calculated cutoff points. For Cook's D, the cutoff for outliers was $4/n-k-1$; for leverage, the cutoff was $2(k/n)$; for standardized residuals, the cutoff was $z = 3$ or greater. For multivariate outlier analysis, comparison of indices with computed cutoff scores indicated that no cases met or exceeded cutoff points. Therefore, outlier analysis did not lead to the

exclusion of any cases from further analysis.

Hurdle Regression. I used Hurdle Regression Analyses (HRA) to examine the influence of condition, fusion, experiential avoidance, and change in negative affect on whether or not participants donated and how much they donated. The HRA model was designed by Cragg (1971) to model data in which sequential decision-making processes were involved, such that the first decision results in a binary outcome and the second decision results in a positive amount (Frees, 2010). Cragg's (1971) original model was applied to the sale of durable goods for which individuals either bought zero goods or a positive amount of goods. He conceptualized the decision of whether or not to buy and how much to buy as two different processes governed (potentially) by different factors. This model is also appropriate for data in this study, as individuals needed to first cross the "hurdle" of deciding whether or not to donate before making the decision of how much to donate. The first step in the model predicts the binary probability of donation. The second part of the model uses a zero-truncated exponential regression model to predict that donation amount for those individuals that crossed the 'hurdle' of deciding to donate. The model was zero-truncated because \$0 donation is conceptualized as a refusal of the donation opportunity.

Statistical Assumptions. In this study, values-oriented behavior was conceptualized as engagement in the donation opportunity, which was a discrete, dichotomous outcome. Statistical assumptions for binary logistic regression models include the following: the dependent variable must be dichotomous; variables must be independent; there must be a linear relationship between continuous independent variables and the logit transformation of the dependent variable; and collinearity between

independent variables should be minimal.

Assumptions regarding independence and binary outcome were met. To examine the relationship between the independent variable and the logit transformation of the dependent variable, a Box-Tidwell procedure (Box & Tidwell, 1962) was used. Results indicated that all variables were linearly related to the logit of the dependent variable. To examine collinearity, correlation matrices were examined for independent variables of fusion, experiential avoidance, and negative affect. There was one significant correlation between fusion and experiential avoidance ($r = .72, p < .001$). No other significant correlations were observed between changes in negative affect and fusion ($r = .03, p = .65$) or between changes in negative affect and experiential avoidance ($r = .03, p = .70$). The high correlation between fusion and experiential avoidance suggests that when both variables are included together in a regression model, interpretations regarding the influence of each variable on charitable giving should be made with caution (Vatcheva et al, 2016). Therefore, to examine the independent contribution of experiential avoidance and fusion, these variables were separated and run in additional hurdle regression models.

Participants. Of the 246 participants who provided valid data, 116 (47%) self-identified as women, 129 (53%) as men, and 1 (0.4%) as transgender. 198 (80%) self-identified as White/non-Hispanic, 9 (4%) as African American, 22 (9%) as Asian, 11 (4.4%) as Hispanic/Latino, 4 (2%) as other, and 1 (0.4%) participant left the race/ethnicity item blank. Ages ranged from 18 to 70 years old, with an average age of 36 ($SD = 11.3$). Table 1 shows descriptive data for demographic characteristics by study condition.

Table 1

Demographics by Assigned Condition

Demographic Variables	VBC Condition (n = 82)		Values Alone Condition (n = 84)		Control Condition (n = 80)	
	n	% of n	n	% of n	n	% of n
Gender						
Female	34	41%	40	48%	42	53%
Male	48	59%	44	52%	37	46%
Transgender	0	0%	0	0%	1	1%
Ethnicity						
Asian/Pacific Islander	10	12%	7	8%	5	6%
African American/Black	5	6%	2	2%	2	3%
White/Non-Hispanic	63	77%	70	83%	65	81%
Hispanic/Latino	4	5%	4	13%	3	4%
Native American	0	0%	0	0%	1	1%
Other	0	0%	1	1%	3	4%
Declined to respond	0	0%	0	0%	1	1%
Income						
Less than \$19,999/year	25	30%	25	30%	24	30%
\$20,000 to \$29,999/year	19	23%	6	7%	11	14%
\$30,000 to \$39,999/year	11	13%	13	15%	13	16%
\$40,000 to \$49,999/year	4	5%	14	17%	13	16%
\$50,000 to \$59,999/year	6	7%	7	8%	7	9%
\$60,000 to \$69,000/year	4	5%	8	10%	2	3%
70,000 to 79,000/year	5	6%	2	2%	5	6%
\$80,000 to \$100,000/year	5	6%	5	6%	0	0%
Greater than \$100,000/year	3	4%	4	5%	5	6%
Educational Level						
Some high school	0	0%	0	0%	1	1%
Diploma/GED	3	4%	4	5%	7	9%
Some college/technical training	25	30%	19	23%	21	26%
Associates degree or college certificate	11	13%	12	14%	11	14%
Bachelor's degree	28	34%	29	35%	27	34%
Some graduate school	6	7%	4	5%	3	4%
Master's degree	8	10%	11	13%	9	11%
Doctorate degree	1	1%	5	6%	1	1%

Randomization. To examine the success of randomization, I compared groups on negative affect pre-randomization, as well as experiential avoidance and fusion. First, I assessed whether the data met preliminary assumptions for a one-way analyses of variance (ANOVA). The distribution of negative affect scores, as well as standardized

residuals of negative affect were highly positively skewed in all three experimental conditions. No attempted transformations were able to successfully correct this.

Therefore, a Kruskal-Wallis test was used. There were no differences between groups in negative affect pre-randomization, $\chi^2(2) = 0.29$, $p = .86$. Fusion scores were also positively skewed and did not meet requirements for homogeneity of variance. Therefore, a Kruskal-Wallis test was used. There were no differences between groups in negative affect pre-randomization, $\chi^2(2) = 1.38$, $p = .50$. For experiential avoidance, data met all requisite assumptions for an ANOVA. There were no differences between groups on experiential avoidance, with $F(2, 235) = 0.41$, $p = .67$.

Table 2

Descriptive Statistics of Independent Variables by Condition

Independent Variables	VBC Condition (n = 80)		Values Alone Condition (n = 80)		Control Condition (n = 76)	
	Mean	SD	Mean	SD	Mean	SD
Fusion	63.64	25.66	66.99	26.03	66.87	34.28
Experiential Avoidance	20.99	10.20	22.44	9.39	21.47	11.40
Negative Affect T1	1.41	0.60	1.44	0.61	1.36	0.57

Note. Negative Affect T1 = Average scores on the first assessment of negative affect, pre-randomization.

Donation. Out of 236 individuals included in analyses, 95 individuals (40%) chose to donate a portion of their earnings (see Figure 3). Among those that donated, the average donation amount was \$0.84 (SD = 0.79, range 2.90). Including only the total donations or those who chose to donate, the VBC group donated an average of \$0.92 (median = 0.55, SD = 0.86, range = 2.90), the Values-Along group donated an average of \$0.82 (median = 0.50, SD = 0.77, range = 2.90), and the control group donated an average of \$0.74 (median = 0.50, SD = 0.7, range = 2.90).

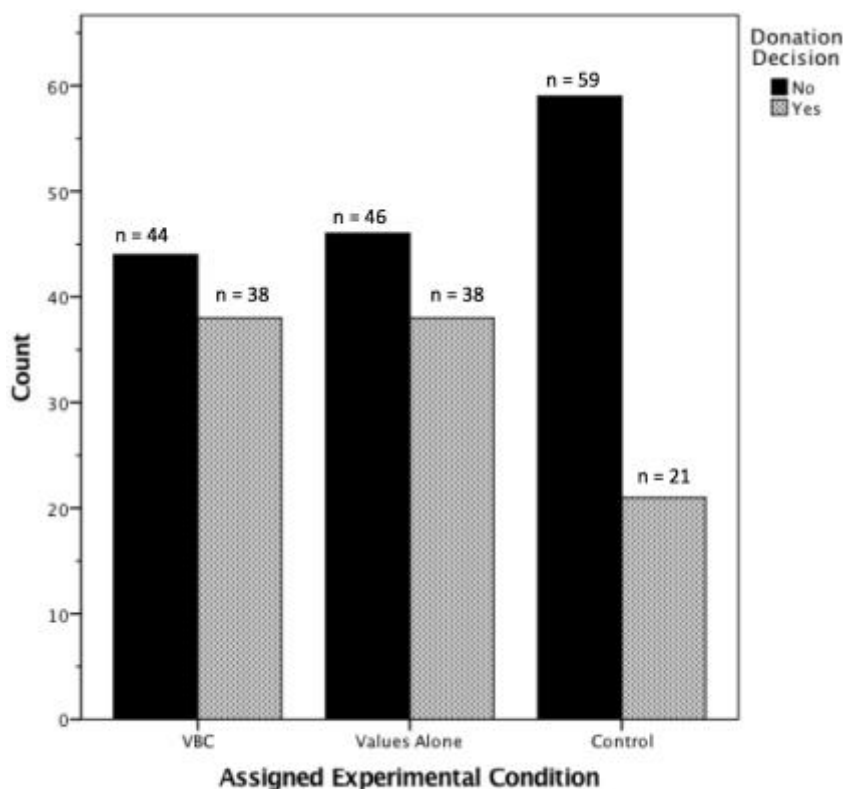


Figure 3. Bar chart of donation frequency by assigned condition (N = 246).

Tests of Hypotheses: The first hurdle regression compared both values groups against the control group and included all independent variables in the model (Table 3; N = 236). The second hurdle regression included all independent variables and compared the VBC and VA conditions directly (N = 160; Table 4.) Results revealed that assignment to either the VBC or VA condition increased the likelihood of donation compared to the control condition ($b = 0.56, p = .01$; and $b = 0.58, p = .008$, respectively). However, the likelihood of donation was not different between values conditions ($b = -0.02, p = .91$). Furthermore, for those individuals that chose to donate, there were no differences between conditions in the amount of earnings donated.

Table 3

Cragg Hurdle Regression Analysis

Binomial Logistic Regression Model (N = 236)					
Variable	Unstandardized Coefficient	Standard Error	z	P	95% Confidence Interval
VBC condition	0.56	0.22	2.54	.01*	0.125, 0.984
VA condition	0.58	0.22	2.66	.008**	0.152, 1.004
Fusion	0.01	0.01	1.48	.14	-0.003, 0.026
EA	-0.04	0.02	-1.82	.07	-0.089, 0.003
Δ Negative Affect	-0.30	0.20	-1.53	.13	-0.686, 0.086
VBC X Fusion	0.00	0.01	0.40	.69	-0.017, 0.026
VBC X EA	0.03	0.03	1.11	.27	-0.026, 0.095
VA X Fusion	-0.01	0.01	-1.28	.20	-0.034, 0.007
VA X EA	0.03	0.03	0.92	.36	-0.033, 0.091

Zero-Truncated Exponential Regression					
Variable	Unstandardized Coefficient	Standard Error	z	P	95% Confidence Interval
VBC condition	0.22	0.28	0.79	.43	-0.327, 0.769
VA condition	0.25	0.28	0.89	.37	-0.295, 0.787
Fusion	0.02	0.01	2.33	.02*	0.003, 0.030
EA	-0.05	0.03	-1.87	.06	-0.107, 0.002
Δ Negative Affect	-0.39	0.24	-1.62	.11	-0.859, 0.082
VBC X Fusion	-0.00	0.01	-0.36	.72	-0.024, 0.017
VBC X EA	0.05	0.04	1.36	.18	-0.022, 0.122
VA X Fusion	0.01	0.01	0.73	.46	-0.014, 0.030
VA X EA	0.04	0.04	-0.30	.77	-0.081, 0.060

Note. * $p < .05$, ** $p < .01$. VBC = Value-Behavior Consistency Condition; VA = Values-Alone Condition; EA = Experiential Avoidance.

To examine the influence of fusion and experiential avoidance on donation, main effects of these variables were analyzed as well as their interactions with condition. No interactions were significant in either the first or second hurdle regression analysis. However, there were some main effects and trends worth noting. There was a trend toward significance for the main effect of experiential avoidance in predicting whether or not individuals chose to donate ($b = -0.04$, $p = .07$) when all conditions were in the model, with lower experiential avoidance being associated with a higher likelihood of choosing to donate. However, when only the VA and VBC conditions were included in

the model, there was no trend toward significance for the main effect of experiential avoidance predicting the decision to donate ($b = -0.01$, $p = .51$).

Table 4

Cragg Hurdle Regression Analysis – Values Conditions Compared

Binomial Logistic Regression Model (N = 160)					
Variable	Unstandardized Coefficient	Standard Error	z	P	95% Confidence Interval
VBC vs VA	-0.02	.20	-0.11	.91	-0.420, 0.375
Fusion	-0.00	.01	-0.32	.75	-0.017, 0.012
EA	-0.01	.02	-0.66	.51	-0.055, 0.027
Δ Negative Affect	-0.31	.20	-1.51	.13	-0.707, 0.093
VBC X Fusion	0.02	.01	1.64	.10	-0.004, 0.040
VBC X EA	0.01	.03	0.18	.85	-0.052, 0.062

Zero-Truncated Exponential Regression					
Variable	Unstandardized Coefficient	Standard Error	z	P	95% Confidence Interval
VBC vs VA	-0.02	.22	-0.11	.92	-0.452, 0.406
Fusion	0.02	.01	2.77	.006**	0.007, 0.041
EA	-0.06	.23	-2.75	.006**	-0.109, -0.018
Δ Negative Affect	-0.34	.24	-1.41	.16	-0.815, 0.134
Condition X Fusion	0.02	.01	-1.01	.313	-0.035, 0.011
Condition X EA	-0.06	.03	1.84	.07	-0.004, 0.125

Note. * $p < .05$, ** $p < .01$. VBC = Value-Behavior Consistency Condition; VA = Values-Alone Condition; EA = Experiential Avoidance.

When examining the influence of fusion and experiential avoidance on the amount of donation, there were significant main effects. When all conditions were included in the model, only fusion was a significant predictor of donation amount, with higher levels of fusion being associated with greater donation ($b = 0.02$, $p = .02$). When examining only the VA and VBC groups, both fusion and experiential avoidance predicted donation amounts. Higher levels of fusion were associated with greater

donation amounts and lower levels of experiential avoidance were also associated with greater donation amounts ($b = .02$, $p = .006$; $b = -0.06$, $p = .006$, respectively).

Post Hoc Analyses. To address the problem of high correlation between experiential avoidance and fusion ($r = .72$, $p < .001$) and the possibility that observed main effects for these variables were a statistical artifact of multicollinearity, I ran separate hurdle regressions for each of these independent variables. The first regression ($n = 236$) compared all three conditions and examined the impact of condition, experiential avoidance, group X experiential avoidance, and negative affect on donation. As was found previously, participants in the values conditions were significantly more likely to donate than individuals in the control condition, with $b = 0.50$, $p = .02$ for the VBC condition, and $b = 0.55$, $p = .01$ for the VA condition. There were no significant main effects or interaction effects for other variables in the model, and none of the predictors significantly predicted donation amount. The second regression ($N = 236$) compared all three conditions and examined the impact of condition, fusion, condition X fusion, and negative affect on donation. Again, only condition predicted whether or not people would choose to donate, with the VBC condition ($b = 0.51$, $p = .02$) and the VA condition ($b = 0.52$, $p = .01$) being more likely to choose to donate than the control condition. None of the predictors significantly predicted donation amount.

Next, I ran hurdle regression analyses without the control condition ($N = 160$) to examine the comparative effects of the values groups as well as the separate relationships between experiential avoidance or fusion with donation. In these models, I also included the interaction between negative affect and condition to examine any differences between conditions in the role of negative affect on donation. The first model included condition,

experiential avoidance, negative affect, condition X experiential avoidance, and condition X negative affect (Table 5). No predictors in the model were significantly related to the choice to donate or the donation amount.

Table 5

Cragg Hurdle Regression Analysis – Values Conditions Compared with Experiential Avoidance and Negative Affect as Predictors

Binomial Logistic Regression Model (N = 160)					
Variable	Unstandardized Coefficient	Standard Error	z	P	95% Confidence Interval
VBC vs VA	-0.06	.20	-0.32	.75	-0.462, 0.333
EA	-0.02	.02	-1.22	.22	-0.049, 0.011
Δ NA	-0.18	.25	-0.71	.48	-0.665, 0.313
Condition X EA	0.04	.02	1.77	.08	-1.214, 0.478
Condition X ΔNA	-0.37	.44	-0.85	.39	-0.342, 0.215

Zero-Truncated Exponential Regression					
Variable	Unstandardized Coefficient	Standard Error	z	P	95% Confidence Interval
VBC vs VA	0.08	.24	0.33	.75	-0.392, 0.548
EA	-0.02	.02	-1.12	.26	-0.058, 0.016
Δ NA	-0.40	.32	-1.26	.21	-1.029, 0.225
Condition X EA	0.04	.03	1.75	.08	-0.005, 0.095
Condition X ΔNA	0.30	.16	0.56	.58	-0.753, 1.349

Note. *p < .05, **p < .01. VBC = values-behavior consistency condition; VA = values-alone condition; Δ NA = negative affect change score; EA = experiential avoidance; condition X EA = interaction between values conditions and experiential avoidance; condition X ΔNA = interaction between values conditions and negative affect change scores.

There were, however, two trends toward significance. The first trend was observed in the interaction between condition and experiential avoidance predicting whether or not individuals chose to donate ($b = .04$, $p = .08$). The second trend was in the interaction between condition and experiential avoidance predicting the amount people donated ($b = 0.04$, $p = .08$). These trends suggested that experiential avoidance may be differentially related to decisions to donate and amount of donation depending on

whether individuals were assigned to the VA or VBC condition. However, experiential avoidance did not predict the amount of donation in the VA group, as the main effect for experiential avoidance was not significant ($b = -0.02$, $p = .26$). To examine the trends further, a follow-up Cragg hurdle regression was calculated containing the same variables as before, although with VBC and VA conditions reverse-coded. Results from the binary logistic regression revealed that the main effect for experiential avoidance in the VBC condition was also not significant ($b = 0.02$, $p = .20$) indicating that experiential avoidance did not independently predict the choice of whether or not to donate in the VBC group. In the zero-truncated exponential regression, the main effect for experiential avoidance was not significant indicating that experiential avoidance did not significantly predict how much people donated in the VBC condition ($b = 0.02$, $p = .17$). After reverse-coding, the interaction terms were again trending toward, but not reaching, significance, and with slopes in the opposite direction ($b = -0.04$, $p = .08$; $b = -0.04$, $p = .08$). These results suggest a possible trend toward differences between the VBC and VA groups in how experiential avoidance was associated with whether or not people donated and how much people donated.

The second regression model included condition (VBC vs VA), fusion, negative affect, condition X fusion, and condition X negative affect (Table 6). In the binary logistic regression, the interaction between condition and fusion was significant ($b = 0.02$, $p = .02$) suggesting that fusion was differentially related to the decision about whether or not to donate depending on condition. There were no significant findings in the zero-truncated exponential regression. Findings revealed fusion did not predict donation in the VA condition ($b = -0.01$, $p = .27$). However, I ran a subsequent binary

logistic regression to examine the relationship between fusion and donation in the VBC condition. For this purpose, the VBC and VA conditions were re-coded. Results indicated that higher levels of fusion predicted greater likelihood of donation in the VBC condition ($b = .01, p = .02$). Furthermore, the results indicated that the interaction was still significant, and in the opposite direction ($b = -.02, p = .02$).

Table 6

Cragg Hurdle Regression Analysis – Values Conditions Compared with Fusion and Negative Affect as Predictors

Binomial Logistic Regression Model (N = 160)					
Variable	Unstandardized Coefficient	Standard Error	z	P	95% Confidence Interval
VBC vs VA	-0.04	.20	-0.20	.84	-0.441, 0.360
Fusion	-0.01	.01	-1.10	.27	-0.017, 0.005
Δ NA	-0.16	.25	-0.66	.51	-0.650, 0.323
Condition X Fusion	0.02	.01	2.44	.02*	0.004, 0.040
Condition X ΔNA	-0.42	.44	-0.97	.33	-0.342, 0.215

Zero-Truncated Exponential Regression					
Variable	Unstandardized Coefficient	Standard Error	z	P	95% Confidence Interval
VBC vs VA	0.03	.24	0.13	.90	-0.434, 0.495
Fusion	0.01	.01	1.30	.19	-0.005, 0.023
Δ NA	-0.52	.32	-1.66	.10	-1.141, 0.094
Condition X Fusion	0.00	.01	0.29	.78	-0.015, 0.020
Condition X ΔNA	0.42	.53	0.80	.43	-0.614, 1.454

Note. * $p < .05$, ** $p < .01$. VBC = values-behavior consistency condition; VA = values-alone condition; Δ NA = negative affect change score; condition X Fusion = interaction between values conditions and fusion; condition X ΔNA = interaction between values conditions and negative affect change scores.

Exploratory Analyses. Cragg hurdle regression analyses revealed that changes in negative affect did not predict donation. To further explore the role of changes in mood as a result of condition, I tested assumptions to run a one-way analysis of variance. The

distribution of the residual scores for change in negative affect were leptokurtic, with kurtosis values > 2 for all groups. Therefore, the assumption of normality was not met. The assumption of homogeneity of variance was also not met, as Levene's statistic indicated significant differences between group variances ($p < .001$). Therefore, a nonparametric Kruskal-Wallis test was performed. There were significant group differences in changes in negative affect, with $\chi^2(2) = 14.3, p < .001$.

To further examine pairwise differences between conditions, Mann-Whitney U tests were performed. Results revealed no differences between VBC and Values conditions ($U = 3077.00, p = .44$). Both the VBC and VA conditions were associated with greater increase in negative affect compared to the control group ($U = 2083.5, p < .001$; and $U = 2368, p < .01$, respectively; see Figure 4). Both the VBC and VA conditions were associated with an average increase of 0.18 per negative affect item on the PANAS ($SD = 0.42$ and 0.57 , respectively) and an average increase of 3.2 on the sum score of negative affect items.

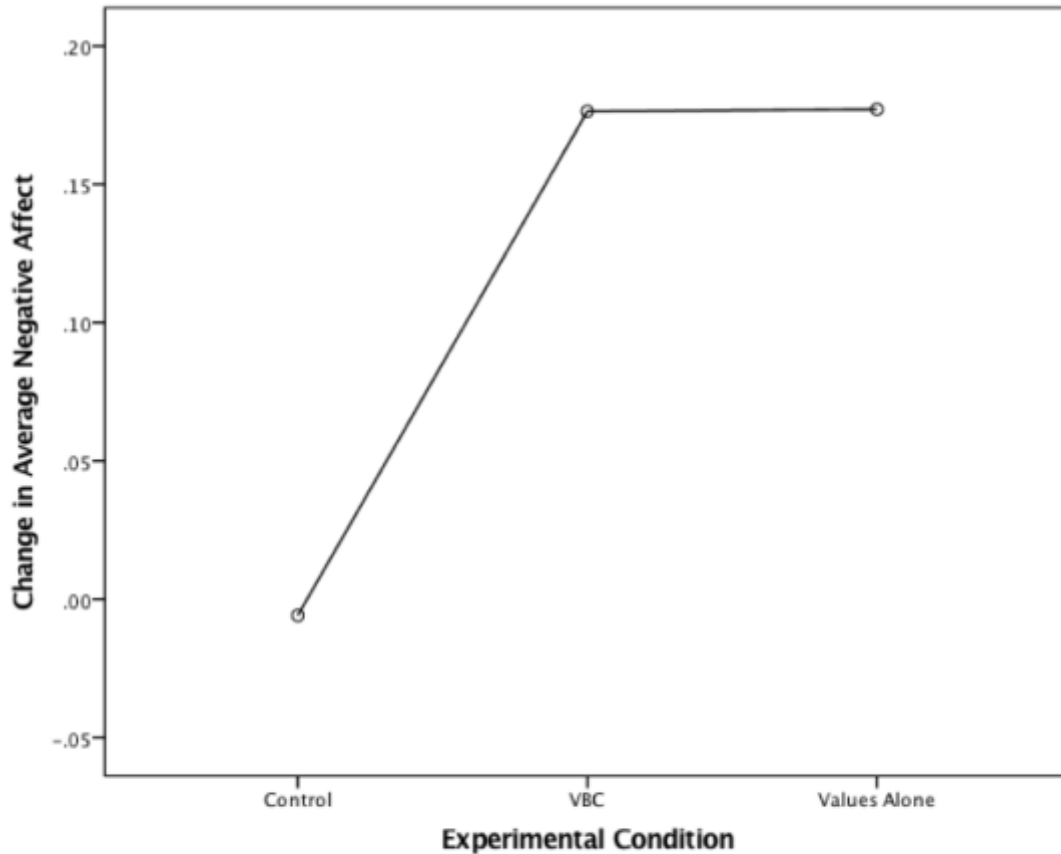


Figure 4. Graph of change in average negative affect scores from pre- to post-manipulation by study condition.

Summary of Results

As expected, both values procedures were more effective at increasing the likelihood of engagement in valued action (i.e., charitable donation) than the attentional control condition. Individuals in both values conditions were more likely to donate a portion of their earnings than individuals in the control condition. However, contrary to expectations, the likelihood that individuals in the VBC condition would choose to engage in values-oriented behavior did not differ from the likelihood that individuals in the VA condition would engage in values-oriented behavior. In other words, the VBC conditions did not lead to a higher likelihood to donate compared to the VA condition.

Other unexpected results involved the hypothesized moderator variables: experiential avoidance and fusion. Multicollinearity observed between experiential avoidance and fusion caused problems with interpretation of their main effects and interactions within the initially proposed regression models. Therefore, to examine whether observed main effects in the proposed models were a statistical artifact of multicollinearity, separate analyses were performed. Separating these variables into different models revealed that the observed main effects in the initial analyses were indeed a statistical artifact of multicollinearity (Vatcheva, 2016). However, new relationships were revealed when the contributions of these independent variables were tested separately.

Counter to expectations, experiential avoidance did not moderate the relationship between condition and decision to donate. However, a trend toward significant differences between the VBC and VA conditions was observed in the binary logistic regression, suggesting that the relationship between experiential avoidance and the decision about whether or not to donate may vary according to which values intervention was administered.

I hypothesized that fusion would moderate the effectiveness of the values interventions. One important finding was that fusion indeed moderated the relationship between condition and decision to donate, but not in the hypothesized direction. Contrary to hypotheses, higher levels of fusion were associated with a higher likelihood of engagement in values oriented behavior (i.e., deciding to donate a portion of their earnings), but only in the VBC condition. Fusion was not associated with the likelihood of values-oriented action in the VA condition. This interaction is noteworthy, as there

were no significant differences in the likelihood for choosing to donate nor the amount donated between the VBC and VA conditions. This suggests that the VBC condition may work differentially for individuals depending on levels of fusion. It is also noteworthy that negative affect was not associated with decisions to donate, nor was the relationship between negative affect and donation different between conditions. This suggests that the relative effectiveness of condition depending on levels of fusion was not related to changes in negative affect.

Exploratory analyses also revealed that for individuals who chose to donate, the level of engagement in valued action (i.e., the amount donated) was not predicted by condition nor hypothesized interactions (i.e., condition x fusion and condition x experiential avoidance), although there was a trend toward a significant interaction between experiential avoidance and donation amount, but only within the values conditions. In other words, there may be differences in how experiential avoidance relates to donation amount when comparing the VA and VBC conditions.

Exploration also revealed that negative emotions did not influence whether individuals chose to donate nor how much they donated, despite findings that individuals in both values conditions experienced greater increases in negative emotion compared to the control condition. However, between the two values conditions, there were no differences in changes in negative affect.

Discussion

Over the years, studies have shown that ACT interventions are effective at increasing engagement in valued behaviors and improving psychological well-being (Gloster et al., 2017; Powers, Vörding, & Emmelkamp, 2010). As evidence for the ACT

model has grown, many scientists have begun to devote attention to evaluating the respective contribution of each component in the ACT model. While randomized controlled trials may be considered the ‘gold standard’ in treatment outcome research, component research is also important because it allows for the testing of theoretical hypotheses with a level of control that is often not possible in standard outcome research (Levin et al., 2012). Findings from component research thus far have shown that values are an integral element in the ACT model (Gloster et al., 2017), and there are several common therapeutic techniques for identifying clients’ values (Wilson et al., 2010; Lundgren et al., 2012; Hayes et al., 2012). At the time of this study, no experiments examining the relative effectiveness of different ACT values techniques had been conducted.

Results from this study confirmed prior findings on the effectiveness of values interventions at increasing motivation to engage in valued behaviors (Freijy & Kothe, 2013; Epton et al., 2014; Harris & Epton, 2009; Pezza, 1991; Levin et al., 2012; Rokeach & McLellan, 1972) while also contributing new findings to the literature. This study was unique in that it isolated the values component from other ACT treatment components and showed a direct relationship between identification of values and increases in values-oriented behaviors using a behavioral measure of valued action. This may also be the first study to directly compare two values techniques to determine their comparative efficacy at increasing valued action.

The adjunct procedure of assessing values-behavior consistency has been believed to confer additional benefits to a values procedure by increasing the likelihood of engagement in values-oriented behavior above a values-identification procedure alone

(Hayes et al., 2012). This study did not confirm any overall benefit of the adjunct procedure; both procedures performed similarly in regards to increasing engagement in values oriented behaviors. However, findings also suggested that higher fusion to negative self-statements was associated with increased engagement in values-oriented behaviors. This was contrary to expected findings.

There is a great amount of evidence to suggest that perceived discrepancies between beliefs, attitudes, values and behaviors increases the likelihood that an individual will seek to establish consistency among them (Stone, 2012). It could make sense then that individuals, after becoming aware that their behaviors are not consistent with their values, might seek to re-establish coherence within their self-concepts through fusion with negative self-statements. Noticing inconsistency between one's actions and values might elicit negative self-assessments such as, "I'm a bad person," since incoherence is typically associated with a long history of social punishment. An individual who is particularly fused to the thought, "I'm a bad person," could thus re-establish coherence between their observed behaviors and their understanding of themselves; someone who is less convinced of the truth of their negative self-statements might not re-establish coherence in this way. For the person with higher levels of fusion, re-establishing coherence in one's self-concept would not depend on changing one's behavior, and thus, it was believed that individuals with greater fusion would demonstrate less engagement in values-oriented behavior after discrepancies between their values and behaviors were brought to their awareness. However, the opposite relationship was found. Individuals with greater fusion were relatively *more* likely to engage in valued action when inconsistencies between their values and behaviors were brought to their awareness.

When inconsistencies were not brought to participants' awareness, as in the simple values procedure, levels of fusion were inconsequential; they were not predictive of donation. Interestingly, both values procedures led to similar likelihood of values-oriented behavior.

One explanation for this observed effect could be that individuals with greater fusion are more likely to engage in efforts to change unwanted thoughts about themselves than individuals with less fusion to negative self-statements. Individuals with higher levels of fusion are likely to relate to their thoughts as representative of truth (Hayes et al., 2012). Therefore, individuals with higher fusion might be more likely to attempt to change their negative thoughts about themselves by engaging in available opportunities to change their self-concepts.

This finding brings forward important questions about how to optimally target values in ACT. While it appeared that the adjunct procedure was especially effective at increasing engagement in valued action for people with higher fusion, the simple values procedure was effective across individuals regardless of fusion levels. In other words, it is not clear that the adjunct procedure provides a distinct advantage over the simple procedure. Furthermore, there is still more to be understood about how values procedures work and how they interact with fusion and other core processes in the ACT model. Higher levels of cognitive fusion (Bardeen & Fergus, 2016) and fusion to negative self-statements, specifically (Duff, Larsson, & McHugh, 2016), has been associated with higher levels of psychological distress. While increasing awareness of values-behavior discrepancies is particularly motivational for individuals with higher levels of fusion to negative self-statements, it is unclear to what extent values-oriented behaviors of this

nature would be associated with the therapeutic outcome of psychological flexibility. Instead, it is possible that values-consistent behaviors that are inspired by efforts to change one's thoughts may lead to behavioral rigidity. For instance, in this study, individuals with greater fusion may have decided to donate in the VBC condition with the narrow aim of changing their negative thoughts that were elicited in the values-behavior discrepancy procedure. This narrow focus may have led to donation despite important reasons *not* to donate. According to ACT theory, fusion involves responding to language or thoughts as if the words themselves were their referents and could be observed in the natural environment (Hayes et al., 2012). In other words, "I am bad" feels real to the person who is fused with that thought. It is no wonder that for the person high in fusion, behavior consequent to the thought "I am bad" would be directed toward addressing the problem of 'badness.' By responding to the internal experience as though it is real and true, fusion is believed to be associated with lower awareness of environmental contingencies that might otherwise influence behavior (Hayes et al., 2012). Seeking to change a negative self-statement might direct attention inward where one is less likely to be sensitive to the real-world consequences of behavior. In contrast, a more psychologically flexible way of responding would involve noticing thoughts as 'just thoughts,' and observing whether the thought is useful toward engaging in life in a way that is consistent with what matters most to them.

While observed inconsistencies between values and behaviors could lead to rigid behavioral attempts to 'solve' verbally constructed problems, it is important to note that the adjunct procedure was associated with engagement in behaviors that were indeed consistent with values. However, it is unknown whether values engagement that is

motivated by attempts to change internal experiences would produce reinforcing consequences equivalent to behavior that was motivated by the mere choice to live in values-consistent ways. When individuals are attempting to change unwanted thoughts about themselves through engagement with values, this contingency can be understood within a context of aversive control. In such a context, the predominant experience after donation might be a form of relief that results after disconfirming a negative thought. It is possible then that these individuals would be less sensitive to the experience of rewarding consequences for congruence between values and behaviors as well as the rewards to be derived from the natural environment. These possibilities introduce important areas for further research regarding which values approach would be most conducive to progress toward psychological flexibility depending on the current psychological functioning of the client.

An observed non-significant trend in the data suggested that experiential avoidance may be related to values-oriented behaviors depending on whether the adjunct values-behavior assessment is included in a values procedure. It would make sense that individuals who are attempting to change negative thoughts about themselves may also be attempting to avoid negative internal experiences associated with incoherence. Indeed, cognitive fusion has been shown to be positively associated with experiential avoidance (Gillanders et al., 2014; Bardeen & Fergus, 2016). In this study, a high correlation between experiential avoidance and fusion was also observed. For individuals with high levels of fusion and experiential avoidance, donation may have functioned to change both thoughts and feelings associated with incoherence. More research is needed to clarify how the interaction between values condition and experiential avoidance affects values-

oriented behavior. While I did not assess whether there were changes in affect after the donation experience, this additional assessment would have provided useful information about the differential effects of donation for individuals depending on assigned condition, fusion to negative self-statements, and experiential avoidance. However, there was no observed correlation between changes in negative affect and experiential avoidance.

Another interesting finding is that negative affect, which has been shown to be associated with contexts of incoherence, did not predict the choice to donate in any of the conditions, nor did it predict the amount of donation. Despite equivalent increases in negative affect between values conditions, there was no indication that negative affect played any role in donation. Negative affect has been shown to be associated with experiences of incoherence, with increases in negative arousal in response to dissonance-induction tasks that can be alleviated upon implementation of a dissonance-reduction strategy (Elliot & Devine, 1994). Therefore, it would make sense to observe a positive relationship between increases in negative affect and donation. However, this was not observed. One reason for this could be that this experiment was internet-delivered, and therefore it is unknown whether incoherence was alleviated by behaviors or environmental factors that could not be observed (e.g., drinking alcohol, distraction, engaging in conversation, etc). Studies have shown that incoherence, or dissonance, can be resolved by engaging in behaviors that are believed to reduce the emotional arousal associated with it (Lee & Schwartz, 2010; Zhong & Lilienquist, 2006; Steele, Southwick, & Critchlow, 1981). Studies have also shown that the presence of environmental distractions can lead individuals to misattribute felt arousal to other factors, reducing the likelihood of behavior change (Schacter & Singer, 1962; Drachman & Worchel, 1976).

Another possibility is that the negative affect was influenced by more than just dissonance (or possibly not influenced by dissonance at all). Negative affect may have been influenced by the negative valence of writing topics in both values conditions. Topics consisted of an array of human problems, such as disease, poverty, and mental health problems. These topics may have been partially, or fully, responsible for observed changes in negative affect.

The mechanism by which values interventions are believed to increase valued action is through the establishment of reinforcement for values-oriented behaviors—a process that is not necessarily associated with change in affect (Hayes et al., 2001). Values interventions are believed to augment the intrinsic reward associated with behavioral adherence to values. Therefore, while negative affect is a relevant variable in relation to incoherence, it is not the proposed mechanism of change for values interventions.

The central finding of this study, that values interventions increased the likelihood for engagement in values-oriented behaviors, provides further support for the ACT model. As a secondary hypothesis, this study sought to better understand the question: which psychological factors might moderate the effectiveness of different values intervention techniques? While this study indeed revealed fusion was a moderator of the VBC procedure, it is still unknown whether this procedure delivers a therapeutic advantage over a simple values procedure.

This study also revealed the important exploratory finding that negative affect may be associated with values procedures. This finding showed that while values procedures may lead to increases in negative affect, these changes in affect do not appear

to influence engagement in meaningful activities. It is difficult to fully understand the practical significance of the magnitude of the observed increase in negative affect, and yet the role of negative affect in values interventions is important to understand, as individuals with more severe levels of psychological distress and experiential avoidance may have difficulty engaging in values work that increases negative affect.

Limitations

A few factors pertaining to study methodology and design have influence on the interpretation of results as well as generalizability of findings to therapy settings. First, participants were recruited from an online national sample of MTurk workers. It can be assumed that MTurk workers are less likely to be fully engaged in the study than would be expected if participation occurred in a laboratory setting or in the context of psychotherapy. MTurk workers are typically under time pressure to finish tasks and earn enough money to make participation worthwhile. Also, since the study was conducted with an online sample, participants could participate from any setting of their choosing. While they were asked to try to limit distractions and were screened for environmental noise, environments were largely uncontrolled and other distraction-associated factors were not able to be assessed.

The uncontrolled participation environment could also have presented opportunities for individuals that experienced awareness of incoherence to re-establish coherence in ways that were not measured in this study. The donation opportunity, which was offered in our study as a means for participants to engage in valued action, may not have been the only available opportunity for participants to exercise valued action in their environments. Therefore, individuals that declined the donation offer may have exercised

valued action in other ways (e.g., texting a friend, deciding to help out a relative or volunteer, etc). Also, we do not know whether participants engaged in values-oriented actions after participation, hence it is possible that this study did not measure the full impact of the values procedures.

The values procedures in this study were somewhat different from those that might be delivered in psychotherapy. This intervention required less time than a values identification procedure might warrant in therapy. Also, clients in treatment choose their personal values from an open set of possible values, whereas the values procedure administered in this study provided a closed set of valued domains for people to choose from. It is therefore possible that values interventions in treatment might be more potent than these procedures, since choosing values from a set of all possible values as opposed to a selected list allows individuals to focus on their most important values.

Lastly, it is important to recognize the role of competing values. Choosing not to engage in valued actions may be influenced by the importance of other values. In other words, there may have been values-oriented reasons not to donate as well, such as the fact that MTurk workers earn money through participation, and improving financial wellbeing by keeping their earnings could be considered valued action for other reasons. However, competing values can be conceptualized as a problem inherent to living; any choice to do something can be understood as a choice not to do something else in its place. As such, managing competing values is often expected to arise in psychotherapy, although it is important to note that characteristics of this study (e.g., payment for participation and MTurk sample characteristics) may have created a context for competition between specific values, and these were not measured or controlled for in

this study. Nonetheless, this study was able to show that these values procedures were effective despite several methodological factors that likely limited its effectiveness.

Conclusions

Interventions that increase awareness of personal values have shown promise in their ability to inspire further engagement in valued actions. Values are integral to ACT, a treatment that continues to grow in empirical support. Adding to the evidence base for ACT, researchers have confirmed the independent contribution of the theorized treatment components, such as values, to client outcomes. Component research is important because it evaluates the accuracy of the theoretical model underlying the treatment framework. However, a useful extension of component research would be to examine how these components can be most effectively targeted using the best and most efficacious techniques, and to examine whether client factors moderate the effectiveness of different techniques. Findings from research of this nature could be used to inform client-centered practice by helping therapists to tailor treatment delivery according to individual factors.

This study confirmed the hypothesis that the effectiveness of values techniques may be moderated by fusion to negative self-statements. However, a full understanding of this relationship and treatment implications for the optimal delivery of values procedures is unknown. Currently, the role of affect in values procedures is not clear, and yet its role is important to examine, particularly in the wake of findings that negative affect may increase as a result of engagement in values procedures. More research is needed to determine how values interventions affect values-oriented behavior and consequent treatment outcome for individuals based on initial levels of fusion and

experiential avoidance. Relatedly, more studies are needed to understand the interplay between the six core ACT components as well as when and how to target specific components over the course of treatment. Research is also needed to assess the magnitude and impact of changes in negative affect that occur in values work and whether these have implications for psychotherapy progress and outcome.

References

- Aitkin, C., McMahon, T., Wearing, A., & Finlayson, B. (1994). Residential water use: Predicting and reducing consumption. *Journal of Applied Social Psychology, 24*, 136-158.
- Aronson, E., Fried, C. B., & Stone, J. (1991). Overcoming denial and increasing the use of condoms through the induction of hypocrisy. *American Journal of Public Health, 81*, 1636-1638.
- Baker, T. L. (1998). *Doing Social Research* (3rd Ed). New York, NY: McGraw-Hill Higher Education.
- Bardeen, J. R. & Fergus, T. A. (2016). The interactive effect of cognitive fusion and experiential avoidance on anxiety, depression, stress, and posttraumatic stress symptoms. *Journal of Contextual and Behavioral Science, 5*, 1-6.
- Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., Waltz, T., & Zettle, R. D. (2011). Preliminary psychometric properties of the Acceptance and Action Questionnaire – II: A Revised measure of psychological flexibility and experiential avoidance. *Behavior Therapy, 42*, 676-688.
- Bonow, J. T. & Follette, W. C. (2009). Beyond values clarification: Addressing client values in clinical behavior analysis. *The Behavior Analyst, 32*, 69-84.
- Box, G. E. P. and Tidwell, P. W. (1962). Transformation of the independent variables. *Technometrics, 4*, 531-550.
- Brandstetter-Rost, Cushing, C., & Douleh, T. (2009). Personal values and pain tolerance: Does a values intervention add to acceptance? *The Journal of Pain, 10*, 887-892.

- Brown, G., & Jones, E. (2005). Implementation of a feedback system in a managed care environment: What are patients teaching us? *Journal of Clinical Psychology, 61*, 187-198.
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high quality, data? *Perspectives on Psychological Science, 1*, 3-5.
- Chase, J.A., Houmanfar, R., Hayes, S. C., Ward, T. A., Plumb Vilaradaga, J., & Follette, V. (2013). Values are not just goals: Online ACT-based values training adds to goal setting in improving undergraduate college student performance. *Journal of Contextual Behavioral Science, 2*, 79-84.
- Cragg, J. G. (1971). Some statistical models for limited dependent variables with application to the demand for durable goods. *Econometrica, 39*, 829-844.
- Croyle, R. T., & Cooper, J. (1983). Dissonance arousal: Physiological evidence. *Journal of Personality and Social Psychology, 45*, 782-791.
- Drachman, D. & Worchel, S. (1976). Misattribution of arousal as a means of dissonance reduction. *Sociometry, 39*, 53-59.
- Duff, H., Larsson, A., & McHugh, L. (2016). Evaluations of self-referential thoughts and their association with components of acceptance and commitment therapy. *Journal of Contextual and Behavioral Science, 5*, 39-47.
- Dymond, S., May, R. J., Munnely, A., & Hoon, A.E. (2010). Evaluating the evidence base for relational frame theory: A citation analysis. *The Behavior Analyst, 33*, 97-117.

- Elliot, A. J. & Devine, P. G. (1994). On the motivational nature of cognitive dissonance as psychological discomfort. *Journal of Personality and Social Psychology*, *67*, 382-394.
- Epton, T., Harris, P. R., Kane, R., van Koningsbruggen, G. M., & Sheeran, P. (2014). The impact of self-affirmation on health-behavior change: A meta-analysis. *Health Psychology*, *34*, 187-196.
- Festinger, L. (1957). *A theory of cognitive dissonance*. Evanston, IL: Row, Peterson.
- Frees, E. W. (2011). *Regression modeling with actuarial and financial applications*. New York, NY: Cambridge University Press.
- Freijy, T., & Kothe, E. J. (2013). Dissonance-based interventions for health behaviour change: A systematic review. *British Journal of Health Psychology*, *18*, 310-337.
- Fried, C. B. (1998). Hypocrisy and identification with transgressions: A case of undetected dissonance. *Basic and Applied Social Psychology*, *20*, 145–154.
- Fried, C. B., & Aronson, E. (1995). Hypocrisy, misattribution, and dissonance reduction. *Personality and Social Psychology Bulletin*, *21*, 925–933.
- Gedo, J. E. (1979). *Toward a revised theory for psychoanalysis*. New York, NY: International Universities Press.
- Gillanders et al. (2014). The development and initial validation of the cognitive fusion questionnaire. *Behavior Therapy*, *45*, 83-101.
- Greenstein, T. (1976). Behavior change through self-confrontation: A field experiment. *Journal of Personality and Social Psychology*, *2*, 254-262.

- Grube, J. W., Greenstein, T. N. Rankin, W. L. Keaney, K. A. (1977). Behavior change following self-confrontation: A test of the value-mediation hypothesis. *Journal of Personality and Social Psychology, 35*, 212-216.
- Grube, J. W., Mayton, D. M., & Ball-Rokeach, S. J. (1972). Inducing changes in values, attitudes, and behaviors: Belief system theory and the method of value self-confrontation. *Journal of Social Issues, 50*, 153-173.
- Gundy, J. M., Woidneck, M. R., Pratt, R. M., Christian, A. W., & Twohig, M. P. (2011). Acceptance and commitment therapy: State of the evidence in the field of health psychology. *The Scientific Review of Mental Health Practice, 8*, 23-35
- Harmon-Jones, E., Amodio, D. M., & Harmon-Jones, C. (2009). Action-based model of dissonance: A review, integration, and expansion of conceptions of cognitive conflict. *Advances in Experimental Social Psychology, 41*, 119-166.
- Harris, P. R., & Epton, T. (2009). The impact of self-affirmation on health-related cognition and health behavior: Issues and prospects. *Social and Personality Psychology Compass, 4*, 439-454.
- Harris, P. R., & Napper, L. (2005). Self-affirmation and the biased processing of threatening health-risk information. *Society for Personality and Social Psychology, 31*, 1250-1263.
- Harrison, R. J., & Green, G. (1990). Development of conditional and equivalence relationship without differential consequences. *Journal of Experimental Analysis of Behavior, 54*, 225-237.

- Hauser, D. J. & Schwarz, N. (2016). Attentive turkers: MTurk participants perform better on online attention checks than subject pool participants. *Behavior Research Methods, 48*, 400-407.
- Hayes, S. C., Barnes-Holmes, D., & Roche, B. (Eds.). (2001). *Relational Frame Theory: A Post-Skinnerian account of human language and cognition*. New York: Plenum Press.
- Hayes, S. C., Brownstein, A. J., Zettle, R. D., Rosenfarb, I., & Korn, Z. (1986). Rule-governed behavior and sensitivity to changing consequences of responding. *Journal of the Experimental Analysis of Behavior, 45*, 237-256.
- Hayes, S. C., Levin, M. E., Plumb-Villardaga, J., Villate, J. L., & Pistorello, J. (2013). Acceptance and commitment therapy and contextual behavioral science” Examining the progress of a distinctive model of behavioral and cognitive therapy. *Behavior Therapy, 44*, 180-198.
- Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment Therapy: Model, processes, and outcomes. *Behavior Research and Therapy, 44*, 1-25.
- Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (2012). *Acceptance and Commitment Therapy: The process and practice of mindful change*. New York: Guilford.
- Hayes, S. C., Wilson, K. W., Gifford, E. V., Follette, V. M., & Strosahl, K. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology, 64*, 1152-1168.

- Hollon, S. D. & Kendall, P. C. (1980). Cognitive self-statements in depression: Development of an Automatic Thoughts Questionnaire. *Cognitive Therapy and Research*, 4, 383–395.
- Horowitz, M. J. (2014). Clarifying values in psychotherapy. *Psychodynamic Psychiatry*, 42, 671-679.
- Kantola, S. J., Syme, G. J., & Campbell, N. A. (1984). Cognitive dissonance and energy conservation. *Journal of Applied Psychology*, 69, 416-421.
- Kirschenbaum, K. (2013). *Values clarification in counseling and psychotherapy: Practical strategies for individual and group settings*. New York: Oxford University Press.
- Lee, S. W., & Schwarz, N. (2010). Washing away post-decisional dissonance. *Science*, 328, 709.
- Leon, A. C., Davis, L. L., & Kraemer, H.C. (2010). The role and interpretation of pilot studies in clinical research. *Journal of Psychiatric Residency*, 45, 626-629.
- Levin, M. E., Hildebrandt, M. J., Lillis, J., & Hayes, S. C. (2012). The impact of treatment components suggested by the psychological flexibility model: A meta-analysis of laboratory-based component studies. *Behavior Therapy*, 43, 741-756.
- Lundgren, T., Dahl, J., Hayes, S. C. (2008). Evaluation of mediators of change in the treatment of epilepsy with acceptance and commitment therapy. *Journal of Behavioral Medicine*, 31, 225-235.
- Lundgren, T., Luoma, J. B., Dahl, J., Strosahl, K., & Melin, L. (2012). The Bulls-Eye Values Survey: A psychometric evaluation. *Cognitive and Behavioral Practice*, 19, 518-526.

- Lytton, S. (1983). Psychoanalytic inquiry: A brief historical survey on the influence of value judgments on psychoanalytic theory and practice. *Psychoanalytic Inquiry*, 3, 573-576.
- Meissner, W.W. (1983). Values in the psychoanalytic situation. *Psychoanalytic Inquiry*, 3, 577-583.
- Mickelburgh, M.E. (1992). Clarification of values in counseling and psychotherapy. *Australian and New Zealand Journal of Psychiatry*, 26, 391-398.
- Miller, W. R., & Rollnick, S. R. (1991). *Motivational Interviewing: Preparing people to change behavior*. New York: Guilford.
- Osborne, J. W., & Overbay, A. (2008). Best Practices in data cleaning: How outliers and “Fringeliers” can increase error rates and decrease the quality and precision of your results. In J. Osborne (Ed.), *Best practices in quantitative methods* (pp. 205-213). Thousand Oaks, CA: Sage Publications.
- Öst, L. G. (2008). Efficacy of the third wave of behavioral therapies: A systematic review and meta-analysis. *Behaviour Research and Therapy*, 46, 296–321.
- Páez-Blarrina, M., Luciano, C., Gutiérrez-Martínez, O., Valdivia, S., Ortega, J., & Rodríguez-Valverde, M. (2008a). The role of values with personal examples in altering the functions of pain: Comparison between acceptance-based and cognitive-control-based. *Behaviour Research and Therapy*, 46, 84-97.
- Páez-Blarrina, M., Luciano, C., Gutiérrez-Martínez, O., Valdivia, S., Rodríguez-Valverde, M., & Ortega, J. (2008b). Coping with pain in the motivational context of values: Comparison between an acceptance-based and a cognitive control—based protocol. *Behavior Modification*, 32, 403-422.

- Peterson, A., Haynes, G., & Olson, J. (2008). Self-esteem differences in the effects of hypocrisy induction on behavioral intentions in the health domain. *Journal of Personality, 76*, 305–322.
- Pezza, P. E. (1991). Value concept and value change theory in health education: A conceptual, empirical, and methodological review. *Health Values: The Journal of Health Behavior, Education, & Promotion, 15*, 3-12.
- Powers, M. B., Vörding, M. B. Z. S., & Emmelkamp, P. M. G. (2009). Acceptance and commitment therapy: A meta-analytic review. *Psychotherapy and Psychosomatics, 78*, 73–80.
- Roche, B., Barnes-Holmes, D., & Barnes-Holmes, Y., (2001). Social Processes. In S.C. Hayes, D. Barnes-Holmes, & B. Roche (Eds.) *Relational Frame Theory: A post-Skinnerian account of human language*. New York: Kluwer Academic/Plenum Publishers.
- Rehfeldt, R. A., & Barnes-Holmes, Y. (2009). *Derived relational responding: Applications for learners with autism and other developmental disabilities*. Oakland, CA: New Harbinger.
- Rogers, C.R. (1959). A theory of therapy, personality and interpersonal relationships, as developed in the client-centered framework. In S. Koch (ed.). *Psychology: A study of science*. (pp. 184-256). New York, NY: McGraw Hill.
- Rogers, C. R. (1964). Toward a modern approach to values: The valuing process in the mature person. *Journal of Abnormal and Social Psychology, 68*, 160-167.
- Rokeach, M. (1973). *The nature of human values*. New York: Free Press.
- Rokeach, M., & McLellan, D. D. (1972). Feedback of information about the values and

- attitudes of self and others as determinants of long-term cognitive and behavioral change. *Journal of Applied Social Psychology*, 2, 236-251.
- Sandoz, E. K., & Anderson, R. S. (2015). Building awareness, openness, and action: Values work in behavior therapy. *The Behavior Therapist*, 38, 60-69.
- Schacter, S. & Singer, J. (1962). Cognitive, social, and physiological determinants of emotional state. *Psychological Review*, 69, 379-399.
- Schwartz, S. H., & Inbar-Saban, N. (1988). Value self-confrontation as a method to aid in weight loss. *Journal of Personality and Social Psychology*, 54, 396-404.
- Sherman, D. K., & Cohen, G. L. (2006). The psychology of self-defense: Self-affirmation theory. *Advances in Experimental Social Psychology*, 38, 183-241.
- Sherman, S. J., & Gorkin, L. (1980). Attitude bolstering when behavior is inconsistent with central attitudes. *Journal of Experimental Social Psychology*, 16, 388-403.
- Skinner, B. F. (1976). *About behaviorism*. New York: Vintage Books.
- Steele, C. M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. *Advances in Experimental Social Psychology*, 21, 261-302.
- Steele, C. M., Southwick, L. L., & Critchlow, B. (1981). Dissonance and alcohol: Drinking your troubles away. *Journal of Personality and Social Psychology*, 41, 831-846.
- Stone, J. (2012). Consistency as a basis for behavioral interventions: Using hypocrisy and cognitive dissonance to motivate behavior change. In B. Gawronski & F. Strack's (Eds.) *Cognitive consistency: A fundamental principle in social cognition* (pp 326-347). New York: Guilford Press.

- Stone, J., & Fernandez, N. C. (2008). To practice what we preach: The use of hypocrisy and cognitive dissonance to motivate behavior change. *Social and Personality Psychology Compass*, 2, 1024-1051.
- Strosahl, K., Robinson, P., & Gustavsson, T. (2012). *Brief interventions for radical change: Principles and practice of Focused Acceptance and Commitment Therapy*. Oakland, CA: New Harbinger.
- Tavris, C. & Aronson, E. (2015). *Mistakes were made (but not by me): Why we justify foolish beliefs, bad decisions and hurtful acts*. New York, NY: Houghton Mifflin Harcourt Publishing Company.
- Tjelveit A. C. (1999). *Ethics and values in psychotherapy*. New York: Routledge; 1999.
- Törneke, N. (2010). *Learning RFT: An introduction to relational frame theory and its clinical applications*. Oakland, CA: New Harbinger
- Vatcheva, K. P., Lee, M, McCormick, J. B., & Rahbar, M. H. (2016). Multicollinearity in regression analyses conducted in epidemiological studies. *Epidemiology*, 6, 227.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Psychology*, 54, 1063-1070.
- Wilson, K. G., & DuFrene, T. (2009). *Mindfulness for two: An Acceptance and Commitment Therapy approach to mindfulness in psychotherapy*. Oakland, CA: New Harbinger.
- Wilson, K. G., Sandoz, E. K., Kitchens, J., & Roberts, M. (2010). The Valued Living Questionnaire: Defining and measuring valued action within a behavioral framework. *The Psychological Record*, 60, 249-272.

- Wray, A.M., Dougher, M.J., Hamilton, D.A., & Guinther, P.M. (2012). Examining the reinforcing properties of making sense: A preliminary investigation. *The Psychological Record*, 62, 599-622.
- Yadavia, J. E., & Hayes, S. C. (2009). Values in Acceptance and Commitment Therapy: A comparison with four other approaches. *Hellenic Journal of Psychology*, 6, 244-272.
- Zettle, R. D., & Hayes, S. C. (1986). Dysfunctional control by client verbal behavior: the context of reason giving. *The Analysis of Verbal Behavior*, 4, 30-38.
- Zhong, C. B. & Liljenquist, K. (2006). Washing away your sins: Threatened morality and physical cleansing. *Science*, 313, 1451-1452.
- Zinberg, N. (1967). Psycho-analytic training and psycho-analytic values. *International Journal of Psychoanalysis*, 48, 88-96.

Appendix A

Amazon Mechanical Turk Recruitment

Psychology Study on Values and Emotions- Earn up to \$3.00 if you qualify.

Requester: Jessica Engle Reward: \$0.05 per HIT HITs available: 0 Duration: 2 Hours

Qualifications Required: HIT Approval Rate (%) for all Requesters' HITs greater than 98 , Location is US

HIT Preview

Survey Link Instructions (Click to collapse)

We are inviting adults, 18 years and over, to participate in our study of values and emotional experiences. The study should take approximately 35 minutes to complete.

You will first be asked to provide your unique MTurk Worker ID. If you have completed other studies from our lab, you will be asked to return the HIT. If you are a new participant, you will be asked to read our consent sheet and answer a few questions about your current situation. If you are not eligible to participate, you will earn \$0.05 for completing the screen. If are eligible to participate, you will then have the opportunity to earn an additional \$2.95 bonus for completing the remainder of the study. This study will involve several questions about your emotions, beliefs, and thoughts, and will also involve a task in which you will write continuously about a topic for a few minutes at a time.

*****Please make sure you have at least 35 minutes of time to complete in one sitting. It is very important for our research that you complete at one time.**

*****Please note, evidence of falsified or misleading data will lead to your work being rejected, and all earnings will be forfeited. You must complete at least 95% of the study for your work to be accepted.**

After you accept the HIT, please select the link below to complete the survey. At the end of the survey, you will be provided with a code that you will paste into the box below to receive credit for taking our survey.

Make sure to leave this window open as you complete the survey. When you are finished, you will return to this page to paste the code into the box.

Figure A1. Amazon Mturk Recruitment Script.

Appendix B

Demographic Instrument

Please select the gender category that best represents you:

- Female
- Male
- Transgender
- Other (Please Specify) _____

What is your age? _____

Please select your personal income level:

- Less than \$19,999/year
- \$20,000 to \$29,999/year
- \$30,000 to \$39,999/year
- \$40,000 to \$49,999/year
- \$50,000 to \$59,999/year
- \$60,000 to \$69,000/year
- \$70,000 to 79,000/year
- \$80,000 to \$100,000/year
- Greater than \$100,000/year

How do you describe your racial/ethnic identity?

- Asian/Pacific Islander
- African American/Black
- Hispanic/Latino
- Native American
- White/Non-Hispanic
- Other: Please specify below _____

What is your educational background?

- Some high school
- High school diploma/GED
- Some college or post-high school technical training
- Associates degree or college certificate
- Bachelor's degree, college graduate
- Some graduate school
- Completed master's degree
- Completed doctorate degree (MD, PhD, EdD, etc)
- Other

Appendix C

The Acceptance and Action Questionnaire II (AAQ II; Bond et al., 2011)

Below you will find a list of statements. Please rate how true each statement is for you by choosing a number next to it. Use the scale below to make your choice.

1	2	3	4	5	6	7
Never True	Very Seldom True	Seldom True	Sometimes True	Frequently True	Almost Always True	Always True

1. My painful experiences and memories make it difficult for me to live a life that I would value.
2. I'm afraid of my feelings.
3. I worry about not being able to control my worries and feelings.
4. My painful memories prevent me from having a fulfilling life.
5. Emotions cause problems in my life.
6. It seems like most people are handling their lives better than I am.
7. Worries get in the way of my success.

Appendix D

The Automatic Thoughts Questionnaire with Believability Scale (ATQ-B; Hollon & Kendall, 1980; Zettle & Hayes, 1986)

The next several questions contain a variety of thoughts that pop into people's heads. Please read each thought and indicate how frequently, if at all, the thought occurred to you over the last week (1 = "not at all", 2 = "sometimes", 3 = "moderately often", 4 = "often", and 5 = "all the time"). Please read each item carefully and indicate the appropriate answers. Then, please indicate how strongly, if at all, you tend to believe that thought, when it occurs. Note that frequency and degree of belief do not need to be the same (1 = "not at all", 2 = "somewhat", 3 = "moderately", 4 = "very much", and 5 = "totally").

- | | |
|--|--|
| 1. I feel like I'm up against the world. | 17. I hate myself. |
| 2. I'm no good. | 18. I'm worthless. |
| 3. Why can't I ever succeed? | 19. Wish I could just disappear. |
| 4. No one understands me. | 20. What's the matter with me? |
| 5. I've let people down. | 21. I'm a loser. |
| 6. I don't think I can go on. | 22. My life is a mess. |
| 7. I wish I were a better person. | 23. I'm a failure. |
| 8. I'm so weak. | 24. I'll never make it. |
| 9. My life's not going the way I want it to. | 25. I feel so helpless. |
| 10. I'm so disappointed in myself. | 26. Something has to change. |
| 11. Nothing feels good anymore. | 27. There must be something wrong with me. |
| 12. I can't stand this anymore. | 28. My future is bleak. |
| 13. I can't get started. | 29. It's just not worth it. |
| 14. What's wrong with me? | 30. I can't finish anything. |
| 15. I wish I were somewhere else. | |
| 16. I can't get things together. | |

Appendix E

The Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen 1988)

Instructions: This scale contains a number of words that describe different feelings and emotions. For each emotion, indicate to what extent you feel this way right now, that is, at the present moment.

	1 very slightly or not at all	2 a little	3 moderately	4 quite a bit	5 extremely
1. Interested					17. Alert
2. Distressed					18. Inspired
3. Excited					19. Dissatisfied
4. Upset					20. Frustrated
5. Guilty					21. Determined
6. Strong					22. Embarrassed
7. Scared					23. Threatened
8. Hostile					24. Attentive
9. Irritable					25. Resentful
10. Enthusiastic					26. Self-Contempt
11. Ashamed					27. Uneasiness
12. Nervous					28. Active
13. Jittery					
14. Proud					
15. Afraid					
16. Disappointed					

Appendix F

Control Condition Writing Prompt 1

Prompt 1: Please read all of the following information. You will need to read this page fully to understand how to respond to the next item. Below is a list of terms related to time management. Time management can be defined as the conscious process of exercising control over the planning and use of one's limited time to spend on a range of specific activities. Choose one time management practice from the list below that is valued in society. We realize that more than one of the above practices is considered valuable. Please choose only one from the following list: Staying organized; planning ahead; making commitments you can keep (not over-committing); keeping a schedule; working steadily toward deadlines; setting goals; keeping a routine, maintaining work-life balance.

Instructions: On the next page, please tell us why people value this specific time management practice and how someone might implement this practice. What you write should be based on general knowledge. Tell us why this practice is useful to others and how it might be implemented. Write continuously. Do not worry about form or style, spelling, punctuation, sentence structure, or grammar. If you run out of things to say, repeat what you have already typed. Keep typing! The page will advance automatically after 4 minutes.

Appendix G

Values Conditions: First Writing Prompt

Please read all of the following information. You will need to read this page fully to understand how to respond to the next item. Below is a list of problems that many humans face both nationally and around the world. We know that this is not a complete list of problems. However, these are issues that many people have identified as important. Choose one issue from the list below that moves you to want to take action and help people in that situation. We realize that you may care about more than one of the issues. Please choose the issue that moves you the most right now: Hunger/famine; poverty; discrimination; disease (such as HIV or cancer); substance abuse, mental health problems; child abuse or neglect; veteran's issues.

Instructions: On the next page, tell us more about why this specific human issue matters to you. What you write may be personal, about people you know, or it may be general information about the issue. All of this is acceptable as long as it tells us why you care about this issue. Write continuously. Do not worry about form or style, spelling, punctuation, sentence structure, or grammar. If you run out of things to say, repeat what you have already typed. Keep typing! The page will advance automatically after 3 minutes.

Appendix H

Values Conditions: Second Writing Prompt

Please read all of the following information. You will need to read this page fully to understand how to respond to the next item. On the last page you told us about an issue you care about. On the next page, we would like you to take a moment to tell us about how you choose to express your care/concern for that issue. By “express your care/concern” we mean expressing through your actions. There are countless ways you may have already done this or would like to do this. For example, some people may express their care/concern about discrimination by working hard to treat people as equals and voting in ways that they believe reflect this concern. Another person who cares about colon cancer may create posts in social media that raise awareness about the disease. We want to know how you choose to express your care/concern for this human issue. Write continuously. Do not worry about form or style, spelling, punctuation, sentence structure, or grammar. If you run out of things to say, repeat what you have already typed. Keep typing! The page will advance automatically after 3 minutes.

Appendix I

Values-Along Condition Questions

Below is a list of statements about actions that are often important to people that care about human issues, such as the issue you wrote about earlier. Please respond to each statement by rating how true each statement is for you according to your own personal sense of what is important, on a scale of 1 (Not At All True) to 7 (Extremely True).”

1. I care about getting involved in solutions to human problems.
2. It is important to take care of people who are less fortunate.
3. I care about giving to people who are in need.
4. It is important to me to try to make a difference in the lives of other people.

Appendix J

Values with Behavior Consistency Condition Questions

We just asked you about how you express your care and concern for human issues through your actions. Now we want you to reflect on your activities over the past week. In our daily lives, it is common to feel pulled in different directions. Most of us find that as much as we deeply care about other humans, the daily events that fill our lives often distract us from living the way we want to and doing what matters most. Sometimes we may forget how much we care about important human issues as we struggle under the weight of the many activities that fill our days.

On the last page you responded to statements about a range of behaviors such as being generous, caring for others, volunteering, and trying to make a difference. Here, take a moment to reflect deeply on how much you have engaged in these actions over the past week. How consistent were your actions with how much you care about each of the behaviors in the list? Please rate the degree to which over the past week your actions matched how important these behaviors are to you, from 1-7, with 1 being “my actions were not at all consistent with how important this is to me,” to 7 being, “my actions were very consistent with how important this is to me.”

1. Getting involved in solutions to human problems.
2. Taking care of people who are less fortunate.
3. Giving to people who are in need.
4. Trying to make a difference in the lives of other people.

Appendix K

Donation Opportunity

We are offering you the opportunity to donate up to the full amount of your bonus earnings (\$2.95), to the charities below. Please select as many charities as you wish. In the space next to the charity, indicate how much you would like to donate. You may donate between \$0.00 and \$2.95 to each donation site, but please do not exceed \$2.95 in donations. All donations will be submitted to charities within 30 days of your donation.

- American Foundation for Suicide Prevention _____
- American Red Cross _____
- Amnesty International _____
- Brain and Behavior Research Foundation _____
- ALSAC – St. Jude Children’s Hospital _____
- Children’s Defense Fund _____
- DAV (Disabled American Veterans) Charitable Service Trust _____
- Susan G Komen for the Cure (breast cancer research) _____
- American Cancer Society _____
- Guide Dog Foundation for the Blind _____
- The Humane Society of the United States _____
- Doctors without Borders, USA _____
- Homes for our Troops _____

Appendix L

Boxplot of Acceptance and Action Questionnaire II (AAQ-II; Bond et al, 2011) Scores
by Experimental Condition

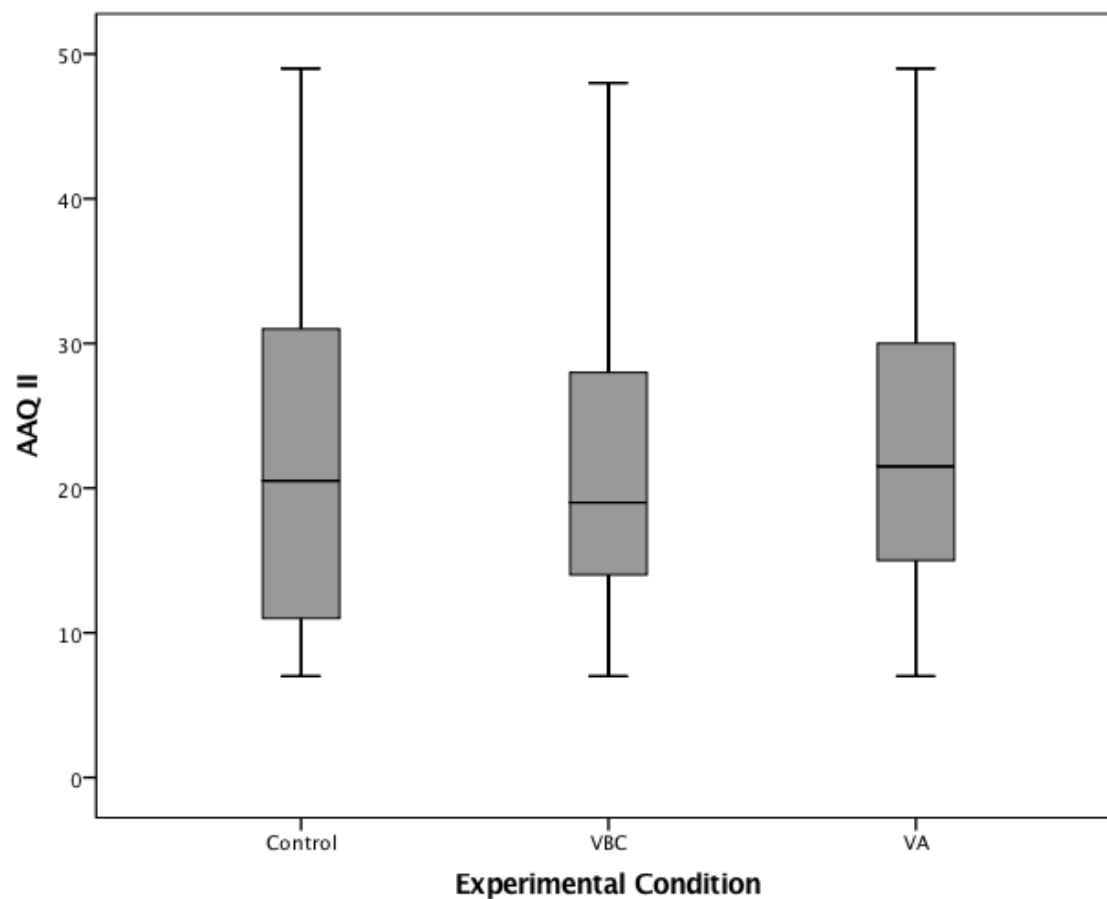


Figure A2. Boxplot of AAQ-II Scores by Experimental Condition. AAQ-II is a measure of experiential avoidance. Scale total scores consist of the sums of item scores. VBC = Values-Behavior Consistency Condition. VA = Values-Alone Condition.

Appendix M

Boxplot of Automatic Thoughts Questionnaire with Beliefs Scale Scores (ATQ-B; Hollon & Kendall, 1980; Zettle & Hayes, 1986) by Experimental Condition

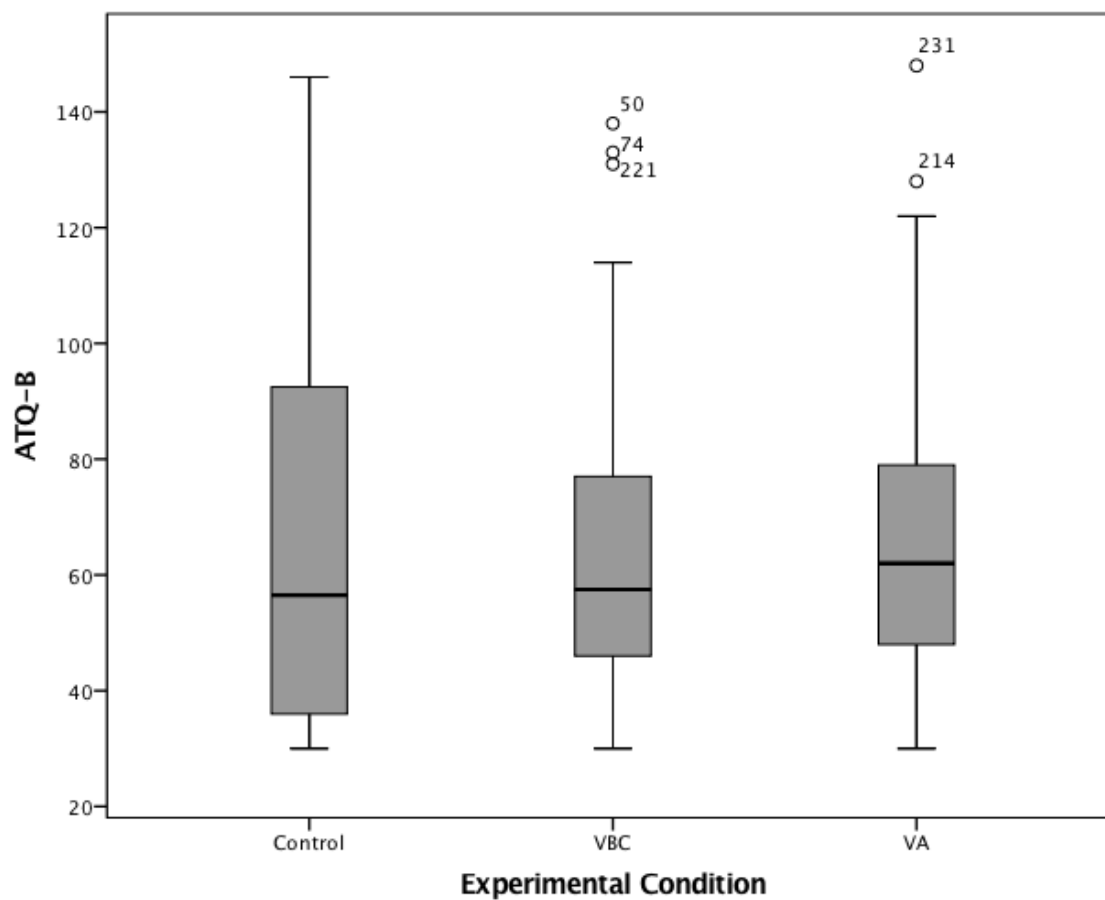


Figure A3. Boxplot of ATQ-B Scores by Experimental Condition. Scale total scores consist of the sums of item scores. VBC = Values-Behavior Consistency Condition. VA = Values-Alone Condition.

Appendix N

Boxplot of Negative Affect Change Scores from the Positive and Negative Affect Scale

(Watson, Clark, & Tellegen, 1988) by Experimental Condition

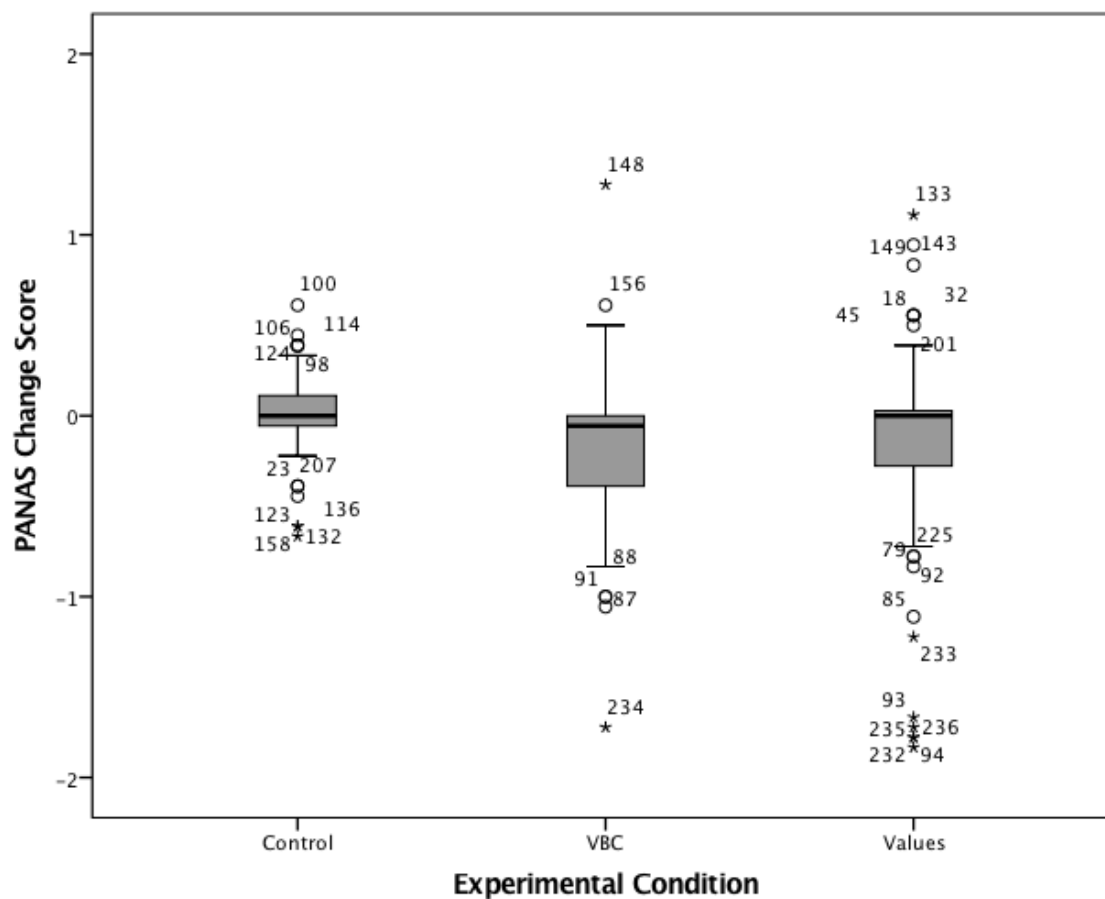


Figure A4. Boxplot of Negative Affect Change Scores from the PANAS. Change scores were computed by subtracting the sum of negative affect item scores from the second administration from the first administration. VBC = Values-Behavior Consistency Condition. VA = Values-Alone Condition.

Appendix O

Boxplot of Total Donation in Dollars by Experimental Condition

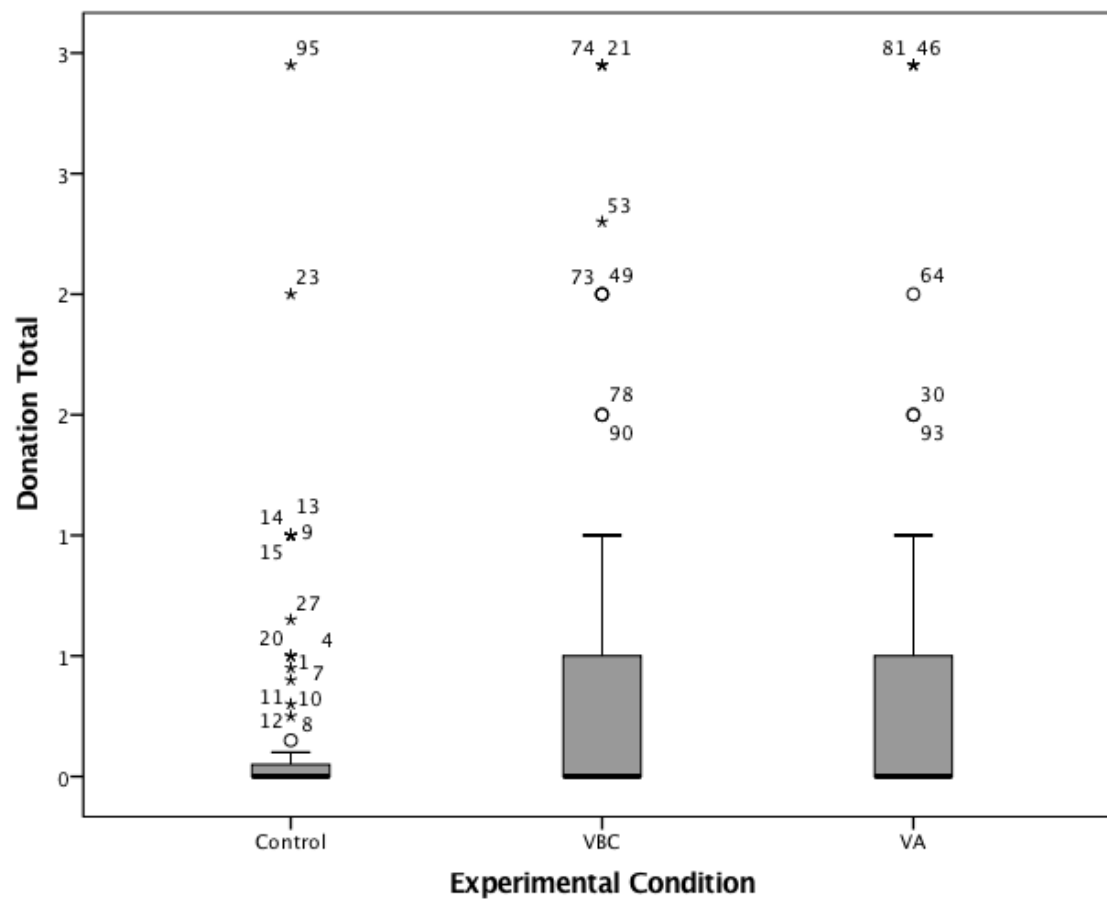


Figure A5. Boxplot of Total Donation in Dollars by Experimental Condition. VBC = Values-Behavior Consistency Condition. VA = Values-Alone Condition.