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The Effects of Activation and Values-Enhanced Activation on Mood

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Introduction

Behavioral Activation (BA) is a contemporary behavioral therapy that aims to lessen depressive symptoms by increasing the activity of depressed individuals. There are many protocols for implementing BA, with most protocols being relatively similar. One difference frequently observed between protocols is the inclusion or omission of values (Kanter et al., 2006, 2009). Despite this variation in protocol, there has yet to be an empirical exploration of whether including values in BA makes the therapy more effective. The current study examines the effect of values-based activation on mood by manipulating the inclusion of values in an activation prompt with a general college student sample. Therefore, the research question that this study aims to answer is whether values-enhanced activation has a more significant impact on mood compared to regular activation.

Literature Review

Behavioral Activation is a standalone treatment for depression anchored in behaviorism and developed through component analysis of other treatments. Built from the functional analysis first articulated by Charles Ferster in 1973, BA operates on the idea that a lack of positive reinforcement of healthy behaviors can lead to the development and maintenance of depressive behavior (Ferster, 1973; Hopko et al., 2003). Investigation into the behavioral mechanisms of depression described by Ferster resulted in empirical support for his conceptualization (Lewinsohn, 1974). However, implementing these findings into a therapeutic context took time and was not strictly behavioral. Behavioral activation was initially used in a therapeutic setting as a component of cognitive therapy (Dimidjian et al., 2011). BA started to become studied as a standalone treatment for depression in 2001, almost 30 years after the initial behavioral conceptualization of depression was published (Jacobsen et al., 2001). Since then, many studies have demonstrated BA's efficacy as a standalone treatment. For example, one study reported that BA performed better than cognitive therapy and just as well as medication for severely depressed individuals in a randomized control trial (Dimidjian et al., 2006). This shows the importance of studying BA, as it may prove to be a more effective treatment than the current therapeutic standard for depression, which is cognitive behavioral therapy. It may also be a good alternative for individuals who do not wish to take medication.

Regardless of the context under which it is implemented, BA's primary goal is to increase patients' activity so that they have more positive experiences that reinforce the activity, yet how this goal is achieved has begun to vary. Therapists use many techniques to achieve this goal including activity monitoring, activity scheduling, problem-solving, and social skill training (Dimidjian et al., 2011). However, recently there has been variation in protocols with regards to

how activity scheduling is implemented. BA protocols have recently been reported to include the identification and inclusion of values-consistent activities when engaging in activity scheduling (Fernández-Rodríguez et al., 2022). Other sources report that the difference between BA and other types of therapy, such as Acceptance and Commitment Therapy (ACT), is that ACT focuses on values while BA does not (Kanter et al., 2006). Nonetheless, recent treatment manuals and descriptions of BA indicate that values should be implemented in its procedure (Kanter et al., 2009; Lejuez et al., 2011). To the best of our knowledge, however, there has not been an empirical study that investigates whether a focus on values-consistent activities is more effective than regular behavioral activation. Therefore, the current study contributes to the literature by isolating this aspect of BA and examining whether values are an essential aspect of activity scheduling.

Although the role of values in BA has not been directly studied, several studies provide evidence suggesting that values may not be necessary for BA to be effective. For example, a recent component analysis revealed that the focus on values in another therapy, ACT, was the worst-performing aspect in the follow-up stage of the research, as it was the weakest predictor of improvements in depressive symptoms (Peterson et al., 2021). In another study that directly compared the performance of BA and ACT in treating depression, BA slightly outperformed ACT. In that study, the researchers propose that BA performed better because the most critical mechanism for improving depressive symptoms was engaging in rewarding activities (Fernández-Rodríguez et al., 2021). Building upon this research, a more recent study compared BA, ACT, and cognitive behavioral therapy, aiming to find whether activation, a component of each of these therapies, is the active ingredient in treating depression. Across treatment groups, the investigators found that individuals who experienced the most activation had the highest

reduction in depressive symptoms, suggesting that activation is the most critical part of these therapies (Fernández-Rodríguez et al., 2022). Additional studies that show the effectiveness of BA are those that show support for the theoretical mechanisms that BA is built upon. For example, one such study reported that individuals who scored low on emotional distress naturally scored high on activation and low on experiential avoidance. The opposite was true of individuals who scored high on emotional distress (Fernández-Rodríguez et al., 2018). Others have reported the success of activation alone, without discussing values, in treating depression (Hopko et al., 2003). Since there is evidence that activation is the most crucial component of therapies that address values and activation is effective in alleviating depressive symptoms without the discussion of values, it is hypothesized that individuals who engage in more activity will report better mood than individuals who are less active, regardless of whether the activity rates high on values-consistency. This will be true of individuals educated on the behavioral mechanisms that affect mood and those who receive additional education on identifying their values and engaging in values-consistent activity.

Methodology

Participants

Subjects were recruited through the Bowling Green State University SONA system, which is affiliated with the Department of Psychology. This system allows students to view a list of studies currently being conducted at the university and sign up to participate in them. In order to participate, subjects were required to be native English speakers over the age of 18 and have access to an Android or iOS smartphone with access to the Appstore and mobile data.

Additionally, they were not allowed to participate if they were enrolled in another study that utilized the ExpiWell App or if they had intentions of committing suicide.

Methods

When signing up for the study, participants chose a timeslot to meet with a research assistant for one hour. Each subject chose a unique timeslot and met with the research assistant one-on-one. At this meeting, the research assistant began the informed consent process by reading the informed consent form to the subject while the subject followed their copy. After reading the form, participants were asked if they had any questions, and once all questions were addressed, they signed the form and were given a copy for their records.

After the informed consent process, subjects completed pre-test questionnaires. The questionnaires that they completed were the Beck Depression Inventory-Second Edition (BDI-II), the Behavioral Activation for Depression Scale (BADs), the Valued Living Questionnaire (VLQ), a one-question activity measure, the UCLA Loneliness Scale, the Brief Experiential Avoidance Questionnaire (BEAQ), and a demographics questionnaire. These questionnaires were administered using the Qualtrics survey app on a laptop during the meeting. After the completion

of the surveys, the research assistant checked the subject's answer to question 9 on the BDI-II to verify that the participant did not have suicidal intent. If any subjects had indicated an answer of 2 or 3, a protocol was in place to ensure the participant's safety.

For the next part of the study, subjects were randomized into three conditions. Randomization was done in advance, and the randomization order was stored on an Excel file with a randomly generated participant ID. Therefore, the study was not blinded, and participants were checked off this list as they enrolled in the study. Subjects were randomized to one of three conditions, which were the activation condition, the values enhanced activation condition, or the control condition. Individuals in the activation group watched a 3-minute video that educated them on aspects of Behavioral Activation, specifically how activity can affect mood. Those in the values-enhanced activation group watched a 4-minute video that included the information presented to the activation group and a discussion of incorporating values into their activity. Both groups were given a handout summarizing the information presented in their videos and were asked to incorporate it into their lives for the next 30 days. Individuals in the control group did not watch any video.

During the final part of the meeting, research assistants trained the subjects on how to download and use the ExpiWell App. Once they had finished this training, subjects were allowed to leave and enter the next phase of the study. During this phase, participants answered a short survey thrice daily over 30 days. The surveys were administered over ExpiWell, which notified participants when to take the survey. Each survey was open from 10 am to 1 pm, 2 pm to 5 pm, and 6 pm to 9 pm every day. Subjects were asked to complete the survey a total of 90 times.

After 30 days, subjects were recontacted through the SONA system and provided with a link to complete the Beck Depression Inventory-Second Edition (BDI-II), the Behavioral

Activation for Depression Scale (BADs), the Valued Living Questionnaire (VLQ), a one-question activity measure, the UCLA Loneliness Scale, the Brief Experiential Avoidance Questionnaire (BEAQ) again. The completion of these questionnaires concluded their participation in the study.

Data Analysis

The data collected from the pre-test and post-test questionnaires was cleaned and graphed in Microsoft Excel. Due to the limited number of participants who have completed the study, this data was not statistically analyzed. The ecological momentary assessment data was analyzed using unified structural equation modeling (uSEM) in RStudio. Each subject was analyzed individually, yielding network graphs for each participant.

Results

Participants

A total of thirteen individuals enrolled in the study and six of them completed the study. Of the six participants who finished all aspects of the study, four were men and two were women. The average age of the participants was 21.33. When asked to report their race, four of them responded that they were White and two of them were Black. One of the participants was in treatment for mental health issues during their participation in the study, three of the subjects had a history of treatment for mental health issues, but none of them were actively taking medications for mental health issues.

Pre-test and Post-test Data

Overall, the experimental manipulation seemed to be effective in some capacity for only one or two of the participants. This can be seen from pre-test and post-test scores on the activity measure and the Activation subscale of the BADS, both of which are presented in Figures 1 and 2. These figures show that activity levels remained relatively unchanged for most of the individuals who participated, both in the control condition and the activation condition. However, participant 4 did show a considerable decrease in depressive symptoms, as measured by the BDI-II, from pre-test to post-test and was the only subject who showed this change. This participant is also the only one who showed a considerable decrease in experiential avoidance, as is shown in Figure 3 below. Therefore, it is possible that experiential avoidance may have impacted the effects of activation on the other variables of interest. For example, even though participant 5 did show an increase in activity, as presented in Figure 1, they also displayed a high level of experiential avoidance both in the post-test and pre-test questionnaire, seen in Figure 3.

Thus, when the manipulation did change behavior, it seems that avoidance remains a prominent issue that may impact the effectiveness of activation.

Figure 1

Pre-test and Post-test Scores on the Activity Measure

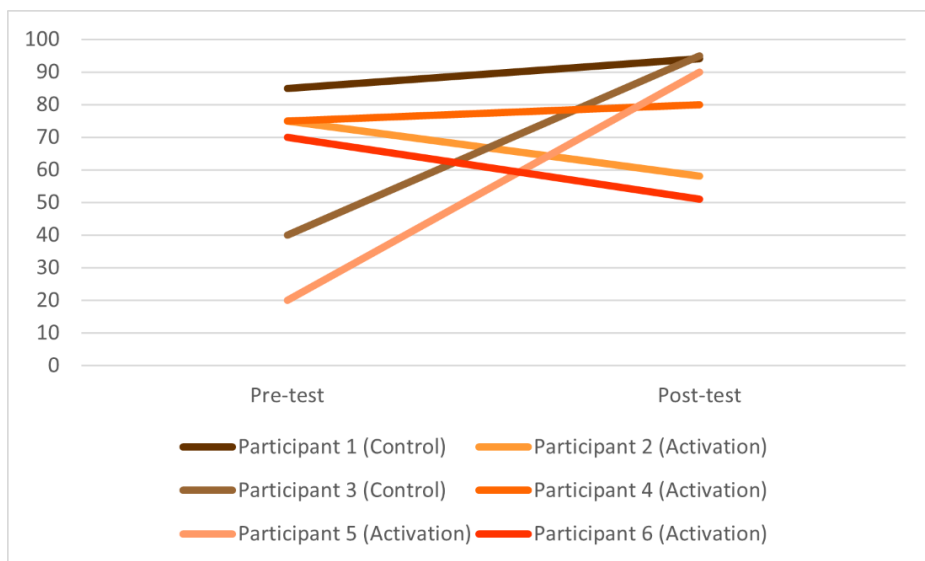


Figure 2

Pre-test and Post-test Scores on the BADS Activation Subscale

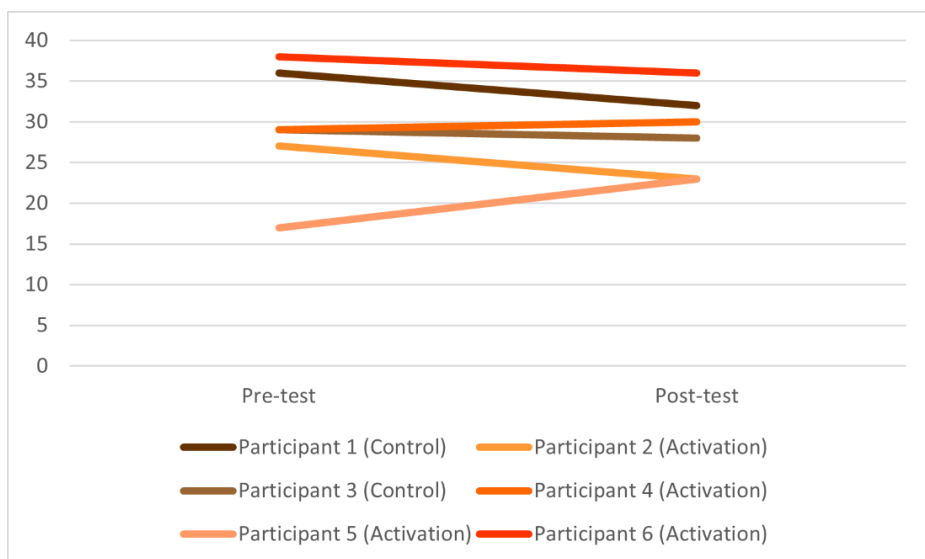
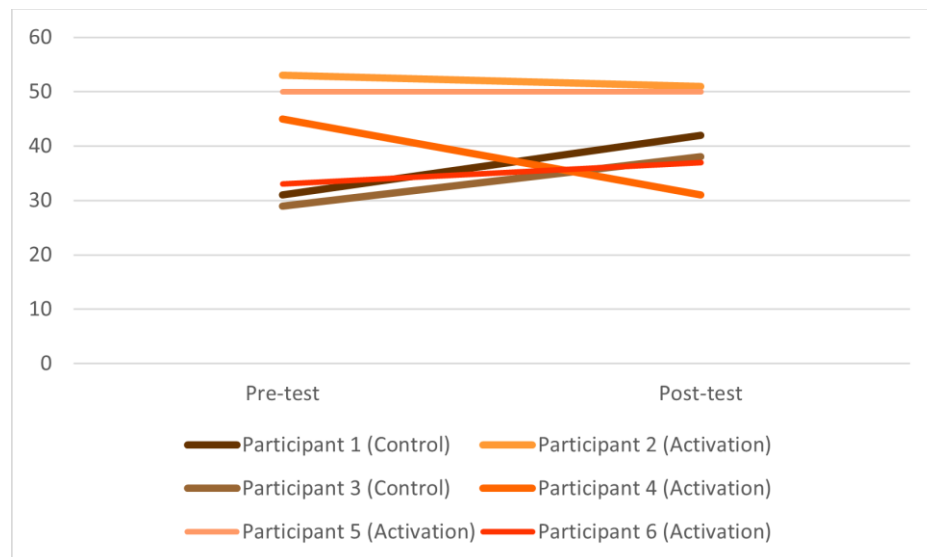


Figure 3

Pre-test and Post-test Scores on the Brief Experiential Avoidance Questionnaire



Ecological Momentary Assessment Data

Shown in Figures 4-9 are the network graphs of the ecological momentary assessment data of each participant, identified through uSEM. In each graph, the nodes represent the subject's score on different measures. Node one represents loneliness, node two represents subjective well-being, node three represents depression, node four represents activity, and node five represents values consistency. The relations between these variables are indicated by the characteristics of each line. A red line indicates a negative relation, while a green line indicates a positive one. A dashed line communicates that the relation is lagged by one time point, while a solid line denotes that the relation is contemporaneous. The absolute value of the relation is indicated by the width of each line. All the participant network graphs showed poor model fit.

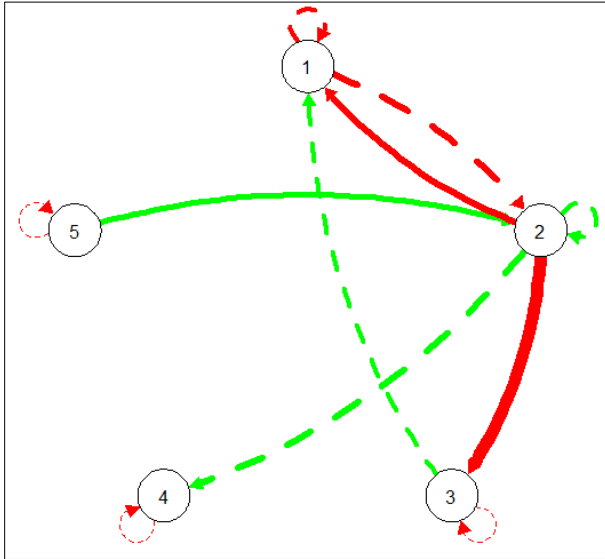
Case Example

To discuss the relations that are described by the network graphs more clearly, a case example was chosen. As participant 5 was one of the subjects that seemed to become more activated, as shown by the pre-test and post-test data, Figure 8 was examined more closely than the others. Figure 8 shows the network graph for participant 5. This model includes autoregressive, cross-lagged, and contemporaneous effects. Nodes 1 and 3, representing loneliness and depression, demonstrated a positive contemporaneous effect such that higher-than-average levels of loneliness was linked with higher-than-average levels of depression at the same time point after controlling for node-specific autoregressive effects. A similar relation emerged between nodes 2 and 5, and nodes 5 and 4, which represent subjective well-being and values-consistency, and values consistency and activity, respectively. A negative contemporaneous relation was demonstrated between nodes 3 and 2, representing depression and subjective well-being, such that higher-than-average levels of depression was linked with lower-than-average levels of subjective well-being at the same time point. Finally, higher-than-average levels of node 1, representing loneliness, during the previous 4 hours was associated with lower-than-average levels of node 5, representing values-consistency, over the next 4 hours after controlling for carry-over on node 1 and node 5, respectively.

Participant 3, who was the other subject that showed an increase in activity, showed some similarities to participant 5, which are shown on their network graph in Figure 6. This participant also had positive contemporaneous relations between subjective well-being and values consistency. They also shared a positive contemporaneous relation between activity and values-consistency. Finally, both subjects showed a negative relation between subjective well-being and depression. However, the directions of these relations varied between the subjects. Additionally, the relation between subjective well-being and depression was lagged for participant 3.

Figure 4

Network Graph for the Ecological Momentary Assessment Data of Participant 1 (Control Condition)

**Figure 5**

Network Graph for the Ecological Momentary Assessment Data of Participant 2 (Activation Condition)

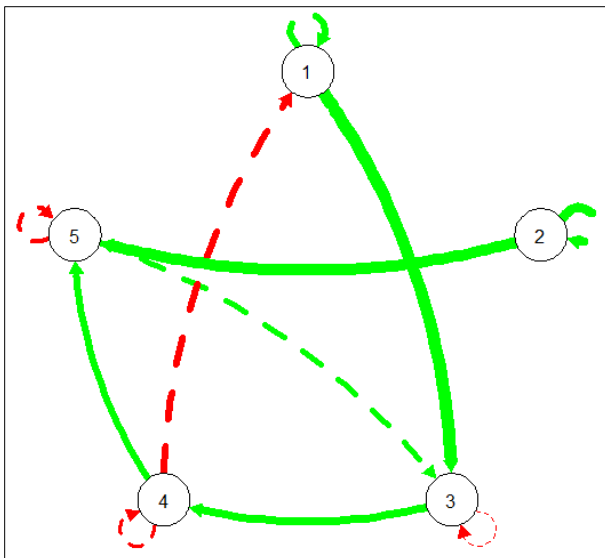
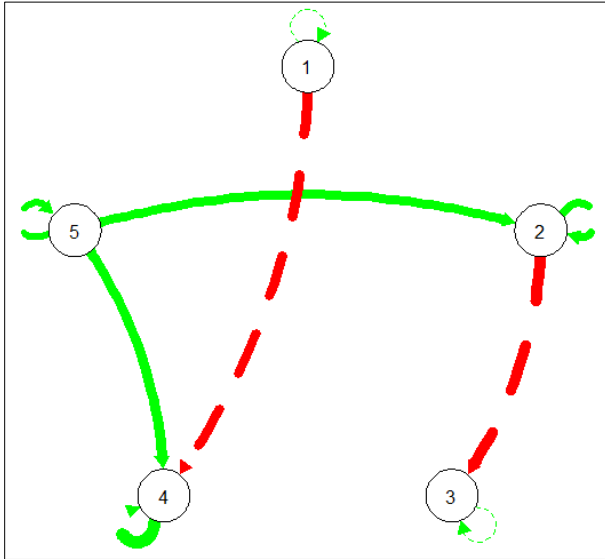


Figure 6

Network Graph for the Ecological Momentary Assessment Data of Participant 3 (Control Condition)

**Figure 7**

Network Graph for the Ecological Momentary Assessment Data of Participant 4 (Activation Condition)

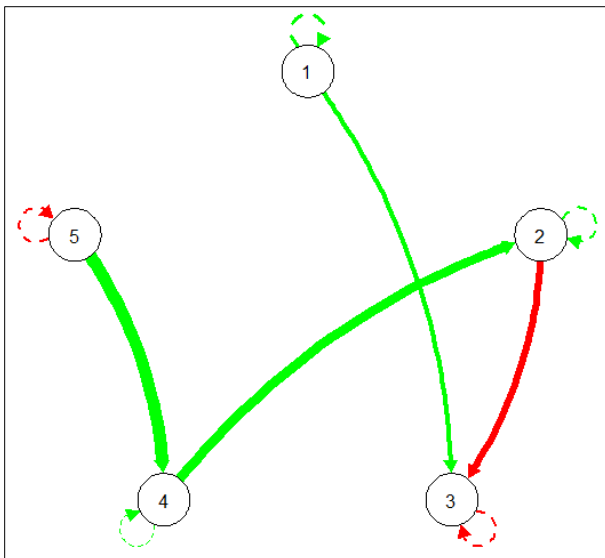
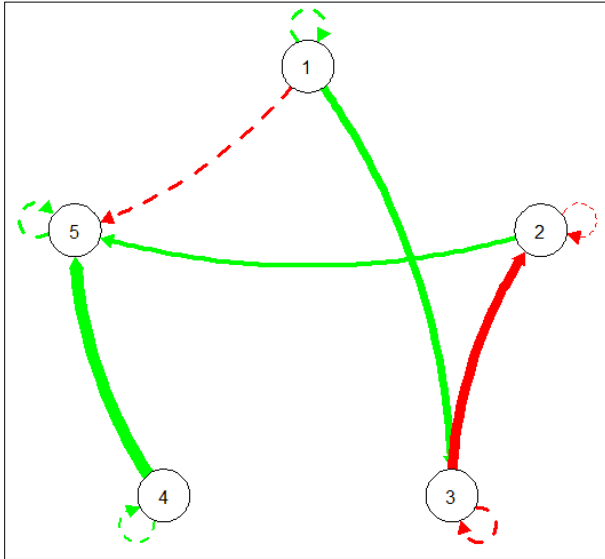
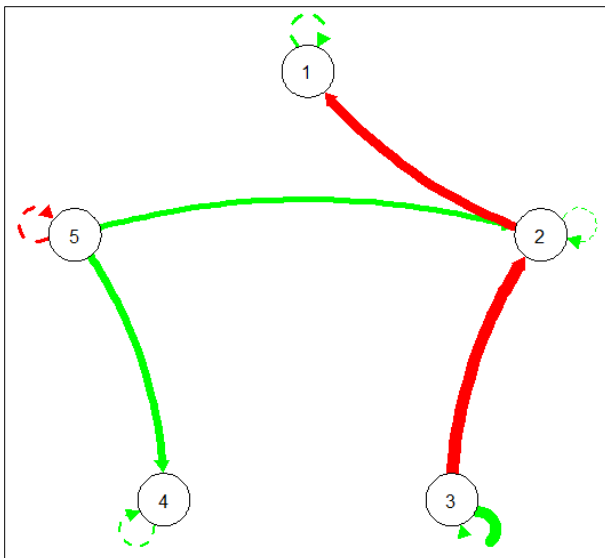


Figure 8

Network Graph for the Ecological Momentary Assessment Data of Participant 5 (Activation Condition)

**Figure 9**

Network Graph for the Ecological Momentary Assessment Data of Participant 6 (Activation Condition)



Discussion

The results of the current study imply that a brief activation prompt may impact the behavior of individuals who do not engage in high levels of experiential avoidance. Therefore, it is possible that experiential avoidance may need to be treated before Behavioral Activation is implemented in practice. However, it is also possible that brief prompts are not powerful enough to change behavior. This would mean that activation requires longer therapy sessions. Although there were commonalities between the individual participant networks, in some types of relations between variables, the strengths and directions of the relations varied. Currently, the sample is not large enough to make a conclusive statement explaining a network model of the variables of interest. However, as the sample increases, it is possible that the similarities seen between the participants who showed an increase in activity will continue to be shared by other individuals who become more active.

One of the main limitations of this study is the small sample size. Since there were only six participants, options for analysis were limited and it is unclear whether the current findings of the pre-test and post-test questionnaires are statistically significant. Additionally, due to low variability in the responses of the current sample, the network graphs showed poor model fit, so they do not represent the data well. Another possible limitation is that the manipulation was too weak to create changes in behavior. Additionally, due to the order of randomization, none of the current participants were in the values condition and the role of values could not be investigated. Therefore, one focus for further research in this area would be to increase the sample size of the current study to gain a better understanding of the relationships between the variables of interest and the role that values have. Another future direction for research in this area could be the exploration of whether brief activation prompts are sufficient to change behavior. This may also

become clear with a larger sample size in the current study. Finally, to avoid ceiling effects of high activity levels in the pre-test measure, future studies on BA may consider screening participants to recruit only individuals who score below average in activity level.

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