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The Role of Social Adjustment in a Collegiate Behavioral Activation Program

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Abstract

The transition to college is associated with significant changes in social support networks and concomitant increases in depressive symptoms. First-year students who are more socially engaged within their new academic settings may experience greater overall wellbeing. Behavioral activation (BA) is an evidence-based intervention which promotes individuals' engagement with valued activities and has been examined as a possible primary prevention for depressive symptoms among first-year students. Yet, the important role of social adjustment, and its impact on students' activity level, has not yet been considered. The current study is a secondary data analysis of research evaluating a BA-based intervention embedded into a first-year orientation course. The aim of the project was to evaluate the efficacy of BA on improving social adjustment and the effect of social adjustment on

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subsequent depressive symptoms. A diverse sample of college students ($n = 71$) attending a state university in the mid-Atlantic region reported on their levels of depression, behavioral activation, and social adjustment. Students then received either BA or standard programming. Results suggest that improved engagement in valued activities at mid-intervention was associated with increases in students' perceptions of their own social adjustment. This, in turn, predicted steeper decreases in rates of depressive symptoms post-intervention. Findings also indicate that greater social adjustment improved the efficacy of a BA-based intervention in reducing depressive symptoms, but had no impact on depressive symptoms for students receiving the standard orientation programming.

Keywords
behavioral activation, college students, depression, social adjustment

The transition from high school to college represents a vulnerable period for the onset of major depressive disorders (Brandy et al., 2018; Ibrahim et al., 2013; Zivin et al., 2009). One meta-analysis found an average prevalence of depression of 30.6% across all college students (Ibrahim et al., 2013), with up to half of first year college students specifically reporting depressive symptoms (Brandy et al., 2015). Elevations in depressive symptoms during this time are troubling given their association with myriad negative outcomes, including increased rates of academic problems (e.g., Hysenbegasi et al., 2005), risky behaviors (e.g., Pedrelli et al., 2016), and suicide risk (e.g., Hirsch et al., 2019).

For many students, starting their first year of college includes significant changes in their levels of independence and responsibility, as well as shifts in social support systems. Social adjustment, defined as students' integration into the new social structures of college life, has been shown to have numerous benefits, including higher rates of academic retention, and greater institutional affiliation (Crede & Niehorster, 2011). Moreover, students with higher levels of social adjustment to college have lower rates of depression, report feeling less lonely, and experience less stress (Crede & Niehorster, 2011). On the other hand, disruptions in experiences of social adjustment during this period may compromise an individual's ability to cope with stress (Pittman & Richmond, 2008), placing students at elevated risk for the onset of depressive symptoms. Further, youth with lower levels of social adjustment may find it more difficult to seek out and engage in rewarding activities, increasing social withdrawal and contributing to the negative reinforcement

cycle of depression (e.g., Carvalho & Hopko, 2011). Given the negative sequalae associated with college-onset depression, there is a need to develop interventions that can improve social adjustment and decrease depressive symptoms during this vulnerable period.

Behavioral Activation for College Students

One promising intervention for depression during the transition to college is behavioral activation (BA). BA focuses on the relationship between mood and participation in rewarding activities (Martell et al., 2001, 2010). Individuals are taught techniques to increase their exposure to pleasant activities through behavioral monitoring and activity scheduling, resulting in reinforcing contingencies that improve affect (Hopko et al., 2003). Thus, BA decreases the withdrawal behaviors characteristic of depression by increasing the number of positive interactions with the environment, which, in turn, decreases depressive symptomology (Carvalho & Hopko, 2011). Numerous reviews and meta-analyses have suggested the efficacy of this approach, pointing to large intervention effects in reducing depression among adults (e.g., Cuijpers et al., 2007; Mazzucchelli et al., 2010) and adolescents (e.g., Martin & Oliver, 2018). Moreover, given the straight-forward nature of BA, the intervention is flexible to administer and is able to be implemented by non-specialists (Magidson et al., 2020; Satinsky et al., 2020). For instance, BA delivered by lay-coaches has been shown to improve social connectedness and decrease levels of loneliness among older adults (Choi et al., 2020).

Limited work to date has adapted BA for college students specifically (c.f. McIndoo et al., 2016). Only one study, to our knowledge, evaluated the impact of BA as a primary prevention for youth during the specifically vulnerable transition from high school to college. Reynolds and colleagues examined the effects of embedding BA within an orientation program at a large, state University (Reynolds et al., 2011). Results suggest that BA effectively reduced student engagement in problematic alcohol use, yet did not have an effect on depressive symptoms. The present study extends these results to consider the impact of social adjustment on how BA may improve depressive symptoms.

Social adjustment may be particularly important to consider in the context of disseminating BA within collegiate settings as students who report feeling more integrated into university social structures both have lower levels of depressive symptoms (Credé & Niehorster, 2012) and may be able to more easily engage in valued and rewarding activities relative to those who have not formed similar supportive structures. To our knowledge, to date no study has specifically evaluated whether social adjustment may influence the efficacy of

BA approaches. This lack of inquiry persists despite (1) conceptual links between social adjustment and engagement in valued activities, the hypothesized mechanism of action in BA (e.g., Solomonov et al., 2019) and (2) empirical links between social adjustment and depressive symptoms (e.g., Horgan et al., 2016).

This extant literature suggests two important avenues to consider with regard to how BA may influence, and be influenced by, social adjustment. First, encouraging students to engage in more valued activities may directly increase their subjective feelings of integration within their collegiate setting which, in turn, may be associated with decreased depressive symptoms. Second, students with higher levels of social adjustment (those who perceive themselves as more integrated into existing social structures) may benefit more from interventions like BA that encourage activity scheduling as a means of improving mood. Alternatively, students who do not feel assimilated to their new educational environment may have more difficulty finding and engaging in prosocial activities, limiting the efficacy of implementing BA as primary prevention within a University setting.

The Current Study

The current study aims to evaluate each of these pathways and determine whether BA enhances students' perceived social adjustment and whether this improvement, in turn, was associated with decreases in depressive symptoms. We hypothesized engaging in BA would have an indirect effect on depressive symptoms through improved social adjustment. Second, we evaluated whether baseline levels of social adjustment may enhance the efficacy of BA in reducing levels of depression. We hypothesized that students who were more integrated in existing social structures (i.e., reporting greater initial levels of social adjustment) would engage in more behavioral activation, resulting in decreases in depressive symptoms.

Method

Participants and Procedures

Participants in the original study included first year college students taking part in a required orientation class (see detailed description in Reynolds et al., 2011). Four classes were randomly assigned to take part in either the adapted BA intervention or standard college orientation programming that focused on promoting student adjustment (see description below). Students were offered extra credit for taking part in the research component of the study. Assessments

were given at baseline (week 2 of the semester), at the mid-point of the intervention (week 7 of the semester), and at the end of the intervention (week 15 of the semester).

All students enrolled in the course were deemed eligible to participate and provided active consent. Parents of students under the age of 18 were also asked to give consent for their child to participate. Of the 73 students enrolled in the orientation class, 71 provided consent to participate and completed the first (baseline) assessment, and 62 completed all key measures at the mid- and post-intervention assessments. Participants in this sample were 55.7% female, with a mean age of 17.90 ($SD_{age} = 0.54$). None of the students were married and 77% identified as "not currently in a relationship." The racial/ethnic make-up of the current sample reflected the larger University population: 57.4% identified as White, 13.1% identified as Black/African-American, 11.5% identified as Hispanic/Latinx, and 18.1% identified as mixed race or another race.

Four interventionists, including two individuals with doctoral-level degrees and two currently enrolled in doctoral programming, taught four total sections of a required orientation program. Sections were randomly assigned to be either the treatment condition (two classes, $n = 37$), or the standard orientation programming (two classes, $n = 34$). Each condition was taught by one doctoral-level interventionist and one doctoral student interventionist. All interventionists were trained and provided weekly supervision by both the last author and the Director of Orientations at the University of Maryland. Treatment outcomes within condition were comparable across interventionists (see Reynolds et al., 2011).

Intervention Conditions

Standard orientation programming. All first-year students admitted to the University of Maryland were required to take this course, which met once a week for 2 hours. The standard orientation program (SOP) was designed to introduce students to the university by identifying resources that are available to students and putting them in contact with an academic advisor who can facilitate their adjustment to college and academic life. The structure of the course was based on discussions of various topics, including: career exploration, campus safety, responsible decision making, academic integrity, sexuality, diversity/inclusion, and library resources. Each student was required to perform a weekly journal entry that reflected the discussions from class. In addition to discussion, each class included a supportive listening exercise, which served to aid the class in adjusting to college.

Behavioral activation orientation programming. Each part of the standard orientation programming was incorporated into the Behavioral Activation Orientation Program (BAOP) course; however, the journaling and discussion were altered to reflect BA strategies. The BAOP course met once a week for 2 hours, providing an equal instructor time compared to the control condition. During week 1, an instructor defined and introduced activity monitoring with the goal of promoting a rewarding college lifestyle. Students were asked to record all daily activities as well as levels of enjoyment during weeks 1 to 3. During week 2, the instructor had the students review their activity monitoring from the previous week and introduced goals and values as the next strategy to reinforce positive activities. During week 3, students identified core values and goals within several categories: school, social relationships, family, financial stability, hobbies, extracurriculars, volunteer work, physical/health issues, and spirituality/personal growth. In week-4, core values and goals were used to identify enjoyable activities that the student deemed as "important" and "valued." Using a behavioral check-out form, activities were chosen for the next week that were in-line with their specific core values and life goals. Students were asked to record each planned activity that was finished. The last 10 sessions (weeks 5–14) monitored how often planned activities were executed and used the behavioral check-out form to plan activities for the following week. Students were asked to identify barriers to their activity planning and pay attention to positive feelings and/or events that went along with each activity.

Measures

Demographics. Students completed a basic demographics form, which included personal information such as age, gender, and ethnicity/race. Given research suggesting that women and younger students report more difficulty transitioning from high school to post-baccalaureate settings (Gall et al., 2000), students' identified gender and age were controlled for in all analyses.

Social adjustment. To measure social adjustment to college, students completed the Student Adaptation to College Questionnaire (SACQ; Baker & Siryk, 1987). The full scale SACQ is a 67-item measure, including 19 items that tap social adjustment. Each item is scored on a 9-point Likert scale ranging from "Doesn't apply to me at all" to "Applies very closely to me." The SACQ was created for assessing early counseling interventions for students (Baker & Siryk, 1987) and has expanded its influence to research, counseling, and university interventions (Dahmus et al., 1992; Grama, 2018). The measure demonstrated adequate internal reliability (coefficient alpha = .79) at baseline.

Behavioral activation. Students' level of behavioral activation was assessed using the Behavioral Activation for Depression Scale (BADS; Kanter et al., 2007). The BADS a 25-item scale used to assess changes in activation, avoidance/rumination, work/school impairment, and social impairment. Each item is scored on a 7-point Likert scale ranging from 0 (not at all) to 6 (completely). The measure was developed to identify when and how participants become activated by a BA program and has shown acceptable construct validity and predictive validity (Manos et al., 2011). Internal consistency for the BADS total score in this sample was excellent; coefficient alpha = .86 and .89 at baseline and mid-intervention, respectively.

Depression symptoms. Students completed the Depression, Anxiety and Stress Scale (DASS; Lovibond & Lovibond, 1995) at each wave. The 42-item scale has three subscales that measure three negative emotions: depression, anxiety, and tension/stress. The participant is asked to rate the extent to which each item applies to them. Each item is scored on a 4-point Likert-type scale between 0 (Did not apply to me at all) and 3 (applied to me very much, or most of the time). Depressive symptoms were measured by summing the scores of each of 14 items that make up the subscale. The DASS has been shown to have high internal validity and consistency among psychometric properties in large adult samples (Crawford & Henry, 2003) as well as college-aged samples (Lovibond & Lovibond, 1995; Lu et al., 2018). Internal consistency for the DASS in this sample was excellent, coefficient alphas = .82 and .89 at baseline and post-intervention, respectively.

Data Analytic Plan

All analyses were conducted using SPSS Version 24. Patterns of missing data were assessed among all key study variables using two separate approaches. First, we evaluated whether missingness correlated with levels of any constructs at baseline. Second, we conducted Little's (1988) missing completely at random (MCAR) test. We then examined descriptive data to determine univariate normality and conducted bivariate correlations among baseline constructs. In order to test our first set of hypotheses, we examined the impact of the intervention on social adjustment and subsequent depressive symptoms. We used multiple regression in which we regressed social adjustment at midpoint on intervention condition (BAOP or SOP), controlling for students' age, sex, and initial levels of social adjustment. We also conducted an additional exploratory linear regression analysis examining whether changes in reported activation levels at midpoint (regardless of intervention condition) were associated with increased social adjustment at midpoint,

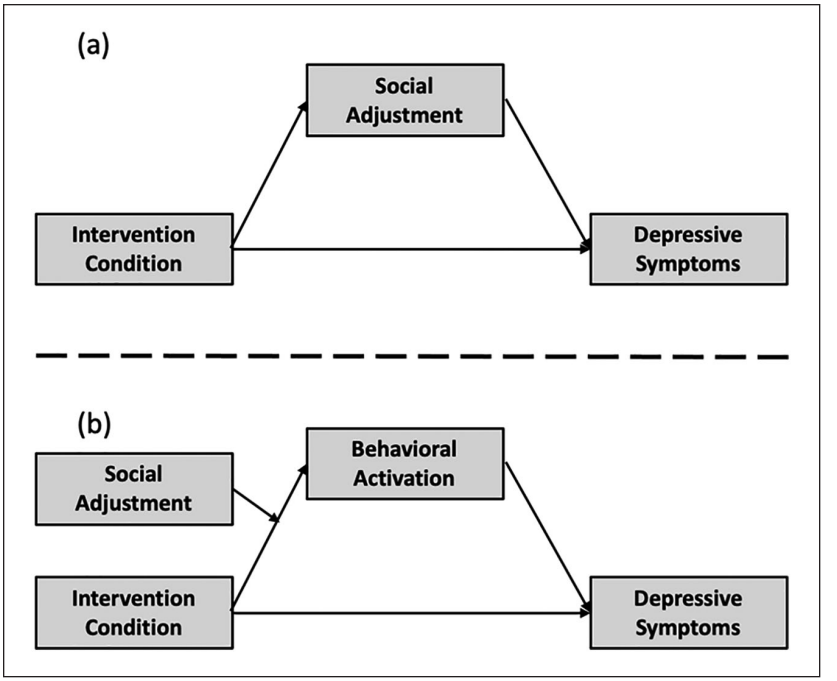

Figure 1. Hypothesized mediational pathways between intervention condition and depressive symptoms via (a) social adjustment and (b) the behavioral activation (moderated by social adjustment).

controlling for students' age, sex, intervention condition, and initial levels of social adjustment and behavioral activation.

To evaluate whether changes in social adjustment mediated the relation between BAOP and depressive symptoms (see Figure 1a), we examined the significance of the indirect path from intervention condition to post-intervention depressive symptoms, controlling for student age and sex, and baseline levels of social adjustment and depressive symptoms. Mediation analyses were conducted using the PROCESS Macro (Hayes, 2009) which employs non-parametric bootstrapping to determine the significance of the indirect pathway. As opposed to approaches based on parametric statistics, bootstrapping does not assume that the distribution of indirect effects is normal (Preacher & Hayes, 2008). Confidence intervals around bootstrapped indirect effects estimates that do not include zero indicate significant mediation effects.

Our second hypothesis suggested that baseline levels of social adjustment would moderate the relation between BAOP and levels of behavioral activation at mid-intervention. First, we conducted a hierarchical linear regression to examine whether the interaction between pre-intervention social adjustment and intervention condition predicted levels of behavioral activation at mid-intervention. In the first step, behavioral activation was regressed onto intervention condition, baseline levels of social adjustment and activation, participant age and sex. In the second step, we added the interaction between intervention condition and baseline social adjustment. Finally, we examined a moderated mediation model in which we evaluated whether changes in behavioral activation at mid-intervention mediated the relation between intervention condition and post-intervention depression symptoms at high and low levels of social adjustment, controlling for levels of each construct at baseline, age, gender.

Results

Preliminary Analyses

Missing data analyses suggest that students in the BAOP condition ($r = .23$, $p = .049$) and those with lower levels of behavioral activation ($r = -.26$, $p = .039$) were more likely to have missing data on post-intervention depressive scores. Little's MCAR test supported the assertion that data could be considered missing completely at random: $\chi^2\,(23) = 23.24$, $p = .447$. Next, we evaluated assumptions of univariate normality. Two participants reported depressive symptoms corresponding to *z*-scores above the critical value of 3.29; these datapoints were deleted as outliers. Skew and kurtosis were then examined across all dependent variables and found to be within acceptable limits (≤ 3.00).

Table 1 reports the means, standard deviations, and bivariate correlations between all key variables. Of note, intervention condition was associated with activation level at the mid-point, suggesting that students in the BAOP group reported lower levels of activation. As expected, there was strong stability of depression symptoms and activation level. Correlations indicated that students who report higher levels of social adjustment at baseline also had greater levels of behavioral activation and lower rates of depressive symptoms at each timepoint.

Predicting Changes in Social Adjustment and Depressive Symptoms

Our first set of hypotheses had to do with predicting changes in social adjustment and subsequent improvements in depressive symptoms. Our linear

Table 1. Means, Standard Deviations, and Bivariate Correlations Between Key Study Variables.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Condition	1.00												
2. Age	0.11	1.00											
3. Sex	0.01	0.07	1.00										
4. Race/ethnicity	0.15	−0.09	0.16	1.00									
5. T1 SACQ	<0.01	<0.01	0.09	0.28*	1.00								
6. T2 SACQ	−0.05	−0.04	−0.08	0.27*	0.46**	1.00							
7. T3 SACQ	0.12	−0.02	−0.06	0.35**	0.54**	0.80**	1.00						
8. T1 BADS	−0.18	−0.21	−0.17	0.27*	0.42**	0.38**	0.41**	1.00					
9. T2 BADS	−0.29*	−0.03	−0.03	0.32**	0.34**	0.58**	0.45**	0.71**	1.00				
10. T3 BADS	−0.08	0.02	0.02	0.29*	0.39**	0.57**	0.60**	0.62**	0.78**	1.00			
11. T1 DASS-Dep	0.08	0.15	0.08	−0.14	−0.54**	−0.32**	−0.33*	−0.56**	−0.30**	−0.39**	1.00		
12. T2 DASS-Dep	0.25	−0.04	0.03	−0.30*	−0.37**	−0.61**	−0.57***	−0.55**	−0.63**	−0.50**	0.52**	1.00	
13. T3 DASS-Dep	0.16	−0.04	0.03	−0.21	−0.25*	−0.49**	−0.44**	−0.38**	−0.58**	−0.64**	0.52**	0.74**	1.00
M (SD) SOP Condition	—	17.85 (0.36)	0.55 (0.51)	0.50 (0.51)	42.41 (10.20)	45.21 (10.15)	44.33 (9.90)	110.14 (18.10)	107.32 (18.90)	105.63 (18.19)	4.59 (6.87)	5.87 (6.91)	6.18 (8.24)
M (SD) BAOP Condition	—	17.97 (0.65)	0.54 (0.51)	0.65 (0.48)	42.47 (9.06)	44.24 (10.54)	46.78 (10.12)	103.74 (18.02)	95.58 (19.83)	102.69 (20.86)	5.51 (5.62)	9.71 (7.80)	8.67 (7.88)

Note. Condition is coded 0 = standard orientation programming (SOP), 1 = behavioral activation orientation programming (BAOP); Sex is coded 0 = male, 1 = female; T1 = baseline; T2 = mid-intervention; T3 = post-intervention; Race/ethnicity is coded 0 = non-white, 1 = white. SACQ = student adaptation to college questionnaire—social adjustment; BADS = behavioral activation for depression scale; DASS = dep, depression, anxiety and stress scale—depression subscale.
*$p < .05$, **$p < .01$.

model including intervention condition predicting changes in social adjustment was significant ($R^2 = 0.21$, $F(4, 54) = 0.67$, $p = .010$), but findings suggest that only baseline levels of social adjustment ($B = 0.50$, $SE = 0.13$, $p < .001$) predicted social adjustment at mid-intervention. We also looked at whether changes in activation level from pre- to mid-intervention (regardless of intervention condition) predicted changes in social adjustment. This model was also significant ($R^2 = 0.46$, $F(6, 52) = 7.42$, $p < .001$). Both pre-intervention social adjustment ($B = 0.31$, $SE = 0.12$, $p = 0.017$) and activation level at mid-intervention ($B = 0.36$, $SE = 0.08$, $p < 0.001$) were significant, suggesting that students who reported the greatest increases in activation also noted the greatest increases in social adjustment during the intervention.

We then evaluated our first mediation model examining changes in social adjustment as a mediator of the relation between intervention condition and post-intervention depressive symptoms (see Figure 1a). Although there was no direct effect of BAOP on depressive symptoms ($B = 1.35$, $SE = 1.75$, $p = .444$), greater increases in social adjustment by mid-intervention were associated with greater decreases in depressive symptoms at post-intervention ($B = -0.37$, $SE = 0.10$, $p < .001$). The indirect effect of BAOP on post-intervention depressive symptoms was not significant ($B = 0.11$, Bootstrapped $SE = 0.96$, 95% CI [−1.68, 2.13]).

Moderating Influence of Social Adjustment

Our second set of hypotheses suggested that social adjustment would moderate the relation between treatment condition and behavioral activation. To test this, we conducted a hierarchical linear regression model, described above. The initial model was significant ($R^2 = 0.54$, $F(5, 54) = 12.55$, $p < .001$) and findings suggest that only baseline levels of activation were associated with activation and mid-intervention ($B = 0.78$, $SE = 0.12$, $p < .001$). The change in the proportion of variance in activation explained by the second step was significant ($R^2 = 0.59$, $\Delta R^2 = 0.05$, $\Delta F(1, 53) = 6.04$, $p = .017$), indicating the interaction term was a significant predictor of activation ($B = 0.95$, $SE = 0.39$, $p = .017$). Post-hoc simple slope analyses suggest that for individuals receiving the SOP, there was no relation between social adjustment and activation levels; however, in the BAOP condition, individuals with higher social adjustment experienced greater increases in their level of activation compared to more socially adjusted youth (see Figure 2). In other words, BAOP increased activation more so for students who were more socially adjusted at baseline.

Next, we examined whether changes in behavioral activation at mid-intervention mediated the relation of the interaction between treatment condition

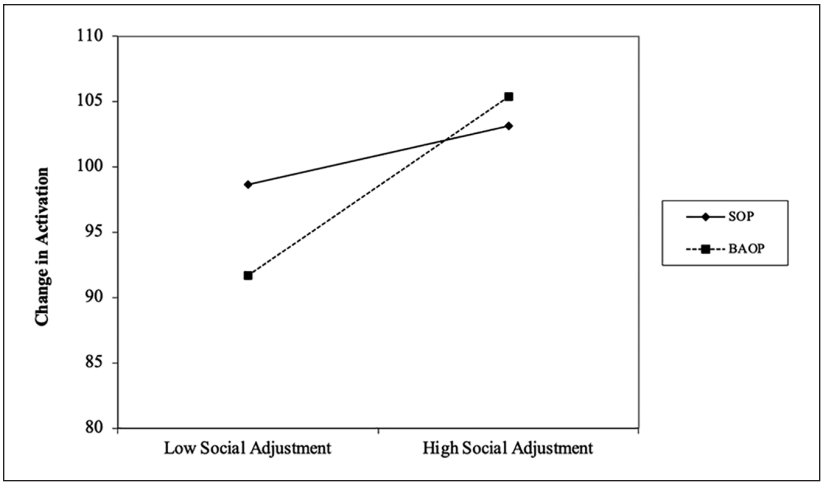

Figure 2. Interaction between social adjustment and intervention condition predicting changes in levels of behavioral activation.
Note. SOP = standard orientation program; BAOP = behavioral activation orientation program.

and subsequent depression symptoms more so for students with higher (relative to lower) levels of social adjustment (see Figure 1b). Results suggest that the interaction term continued to predict changes in behavioral activation (in the same direction as reported above) and that increase in activation, in turn, predicted decreases in depression symptoms ($B = -0.28$, $SE = 0.06$, $p < .001$). Moreover, the index of moderated mediation was significant (Index = −0.28, Bootstrapped $SE = .13$, 95% CI [−0.55, −0.06]). Post-hoc probing of these conditional processes indicates that higher initial social adjustment was associated with greater increases in activation at mid-treatment and greater decreases in subsequent depressive symptoms for students in the BAOP condition only ($B = -0.30$, Boostrapped $SE = 0.13$, 95% CI [−0.59, −0.05]). There was no impact of social adjustment on activation levels for students who received SOP ($B = 0.03$, Bootstrapped $SE = 0.10$, 95% CI [−0.19, 0.21]).

Discussion

First year college students, and specifically those who have difficulty socially adjusting to their new settings, are vulnerable to developing depression (Horgan et al., 2016) and at greater risk for myriad negative outcomes (Gerdes & Mallinckrodt, 1994). Widespread implementation of a brief primary prevention approach has the potential to reduce these risks and improve academic

and psychosocial outcomes for individuals as they transition to collegiate life. The current study examined one promising approach, Behavioral Activation, adapted for dissemination as an orientation program in a large, diverse University sample. Findings indicated that, although there was not a direct effect of the Behavioral Activation Orientation Program (BAOP) on social adjustment, increasing activation levels (regardless of intervention condition) was associated with improved social adjustment over time for all students. Greater increases in social adjustment were, in turn, associated with decreases in depressive symptoms. Results also suggest that greater initial perceptions of social adjustment enhance the efficacy of BAOP by increasing engagement in activities and, subsequently, reducing depressive symptomology.

Importantly, our findings highlight that increasing students' engagement in valued activities has the potential to improve social integration into new collegiate settings. These results were consistent across condition, suggesting that individuals in the SOP who also evidenced greater increases in activation (perhaps due to normative increases in engagement with collegiate activities) garnered similar benefits as students in BAOP. Although only a small number of studies have examined the efficacy of focusing on activity scheduling to improve social constructs (e.g., Campbell et al., 2019), there is a growing recognition that increasing social skills broadly may be one mechanism by which BA reduces depressive symptoms (e.g., Hopko et al., 2003). This may also reflect a broader potential approach by which academic institutions may tailor orientation programs to meet the needs of incoming students. Given the mission of most first year orientation programs is to support increases in engagement within the college setting, incoming students may benefit from programs with a greater focus on increasing student engagement. Indeed, some research suggests that small group programs (including those that have students take part in precollege orientation activities), have the potential to directly increase social adjustment prior to the transition to the collegiate setting (e.g., Paul et al., 2001).

These findings may also be particularly important for interventions conducted in diverse university settings. Although the extant literature provides mixed findings on the relation between race/ethnicity and psychiatric symptoms among college students (Blanco et al., 2008; Eisenberg et al., 2013), research does suggest that students of color experience greater variability in their perceived social integration to university settings (Credé & Niehorster, 2012) and are less likely to access mental health services (Lipson et al., 2018). Thus, primary prevention approaches focused on increasing activity engagement has particular relevance for efforts to decrease disparities in both social adjustment and health care access within collegiate settings. Our results also demonstrate that social adjustment enhances the efficacy of

BAOP. In other words, our results suggest that BAOP requires a certain level of initial adjustment in order to experience its full benefits. In contrast, individuals who are less integrated into academic social structures may have a more difficult time successfully seeking out valued activities to engage in. This may be due in part to the group delivery format which precluded interventionists working directly with students to identify personal barriers to seeking out activities. Instead, individuals who already possessed the resources to seek out valued activities experienced greater benefits.

Indeed, these findings are consistent with other research suggesting that individuals with greater social networks, such as married partners (relative to single individuals), experience greater positive outcomes from BA (Hopko et al., 2008). These results also coincide with earlier conceptualizations of BA which emphasized the need to focus on developing social skills alongside pleasant activity scheduling (e.g., Lewinsohn, 1974). Despite the intuitive appeal of this model, this is the first study, to our knowledge, to directly examine social adjustment as a moderator of treatment outcomes. These findings have implications for both successfully targeting this intervention and also suggest possible avenues for future refinement of the approach. Specifically, it may be helpful to modify BAOP to include an additional focus on increasing social integration and skills building early in the intervention to improve the efficacy of this approach.

Strengths, Limitations, and Future Directions

Findings from current study add to the emerging literature on novel adaptations to, and implementation of, BA approaches for at-risk populations in a number of ways. For instance, the current intervention utilized a novel dissemination strategy to reach vulnerable first year college students by imbedding an evidence-based program (BA) into an existing orientation program. If results are replicated in larger samples, and given that similar orientation programming is already widely available in many colleges, this approach may be both cost effective and scalable. This study also has several methodological strengths, including its use of a randomized design and longitudinal data collections that allows for identifying prospective intervention effects and are less biased than cross-sectional or non-randomized approaches. Third, the focus on identifying mechanisms of change is important for understanding how an intervention works (Kazdin, 2007, 2008) and, specifically, the processes by which increasing levels of activation may impact subsequent pathology. Further, identifying moderators of treatment outcomes allows for the identification of individuals who may benefit most from a specific intervention approach and how, in turn,

such an approach may be improved to increase its efficacy for all participants.

Despite these strengths, several limitations suggest possible avenues for future research. First, although the intervention was conducted in a diverse college setting, the current sample size in not sufficient to explore potential demographic moderators thought to influence mental health outcomes during college including race/ethnicity and first-generation college student status. Moreover, this study may have been underpowered to find smaller effects. Future, larger-scale interventions are needed to replicate current findings and better understand how this intervention may differentially impact vulnerable individuals. Second, participants activation records were not collected and, thus, we were not able to examine the type of activities (e.g., interpersonal vs. non-interpersonal) participants were engaging in. Further research is needed to understand how the activity type may influence mental health outcomes. Third, as noted in Reynolds et al. (2011), intervention fidelity was not assessed. Future studies should consider this and other implementation outcomes (e.g., acceptability, sustainability, appropriateness; Proctor et al., 2011). Finally, our analysis was restricted to the timing of the intervention and some conclusions may be better supported with a longer study or follow up period. Specifically, additional follow-up data collections would be important to determine if improving social adjustment has lasting effects across important transition points (e.g., between academic years, during "finals" periods) that are meaningful throughout a student's college career.

Conclusions and Current Implications

Our results demonstrated the important role that social adjustment plays in a primary prevention program for reducing depressive symptoms among first year college students. These findings help to clarify how engaging in valued activities may improve mood and point to specific clinical implications for increasing well-being among vulnerable college students. For instance, results indicate that more attention to fostering social adjustment immediately following the transition to college may both independently, and in conjunction with BA-based programming, result in reductions in depressive symptoms. Given the individual and institutional costs associated with depression, our findings also highlight the need for continued research into this critical period of development.

Declaration of Conflicting Interests

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References

Baker, R. W., & Siryk, B. (1987). *(SACQ) student adaptation to college questionnaire*. http://www.wpspublish.com/sacq-student-adaptation-to-college-questionnaire

Blanco, C., Okuda, M., Wright, C., Hasin, D. S., Grant, B. F., Liu, S.-M., & Olfson, M. (2008). Mental health of college students and their non-college-attending peers: Results from the National Epidemiologic study on alcohol and related conditions. *Archives of General Psychiatry*, *65*(12), 1429–1437. https://doi.org/10.1001/archpsyc.65.12.1429

Brandy, J. M., Kessler, T. A., & Grabarek, C. H. (2018). A grounded theory investigation into sophomore students' recall of depression during their freshman year in College: A pilot study. *Journal of Psychosocial Nursing and Mental Health Services*, *56*(9), 44–50. https://doi.org/10.3928/02793695-20180329-02

Brandy, J. M., Penckofer, S., Solari-Twadell, P. A., & Velsor-Friedrich, B. (2015). Factors predictive of depression in first-year college students. *Journal of Psychosocial Nursing and Mental Health Services*, *53*(2), 38–44. https://doi.org/10.3928/02793695-20150126-03

Campbell, S. B., Fortney, J., Simpson, T. L., Jakupcak, M., & Wagner, A. (2019). Change in social support while participating in behavioral activation for PTSD. *Psychological Trauma Theory Research Practice and Policy*, *11*(8), 905–908. https://doi.org/10.1037/tra0000470

Carvalho, J. P., & Hopko, D. R. (2011). Behavioral theory of depression: Reinforcement as a mediating variable between avoidance and depression. *Journal of Behavior Therapy and Experimental Psychiatry*, *42*(2), 154–162. https://doi.org/10.1016/j.jbtep.2010.10.001

Choi, N. G., Pepin, R., Marti, C. N., Stevens, C. J., & Bruce, M. L. (2020). Improving social connectedness for homebound older adults: Randomized controlled trial of tele-delivered behavioral activation versus tele-delivered friendly visits. *American Journal of Geriatric Psychiatry*, *28*(7), 698–708. https://doi.org/10.1016/j.jagp.2020.02.008

Crawford, J. R., & Henry, J. D. (2003). The depression anxiety stress scales (DASS): Normative data and latent structure in a large non-clinical sample. *British Journal of Clinical Psychology*, *42*(2), 111–131. https://doi.org/10.1348/014466503321903544

Credé, M., & Niehorster, S. (2012). Adjustment to college as measured by the student adaptation to college questionnaire: A quantitative review of its structure and

relationships with correlates and consequences. *Educational Psychology Review*, *24*, 133–165. https://doi.org/10.1007/s10648-011-9184-5

Cuijpers, P., van Straten, A., & Warmerdam, L. (2007). Behavioral activation treatments of depression: A meta-analysis. *Clinical Psychology Review*, *27*(3), 318–326. https://doi.org/10.1016/j.cpr.2006.11.001

Dahmus, S., Bernardin, H. J., & Bernardin, K. (1992). Student adaptation to college questionnaire. *Measurement and Evaluation in Counseling and Development*, *25*(3), 139–142.

Eisenberg, D., Hunt, J., & Speer, N. (2013). Mental health in American colleges and universities: Variation across student subgroups and across campuses. *The Journal of Nervous and Mental Disease*, *201*(1), 60–67. https://doi.org/10.1097/NMD.0b013e31827ab077

Gall, T. L., Evans, D. R., & Bellerose, S. (2000). Transition to first-year university: Patterns of change in adjustment across life domains and time. *Journal of Social and Clinical Psychology*, *19*(4), 544–567. https://doi.org/10.1521/jscp.2000.19.4.544

Gerdes, H., & Mallinckrodt, B. (1994). Emotional, social, and academic adjustment of college students: A longitudinal study of retention. *Journal of Counseling & Development*, *72*(3), 281–288. https://doi.org/10.1002/j.1556-6676.1994.tb00935.x

Grama, B. (2018). The student adaptation to college questionnaire (SACQ) for use with Romanian students. *Psihologia Resurselor Umane Revista Asociației de Psihologie Indusstrială Și Organizațională*, *16*(1), 16–26.

Hayes, A. F. (2009). Beyond Baron and kenny: Statistical mediation analysis in the New Millennium. *Communication Monographs*, *76*, 408–420. https://doi.org/10.1080/03637750903310360

Hirsch, J. K., Rabon, J. K., Reynolds, E. E., Barton, A. L., & Chang, E. C. (2019). Perceived stress and suicidal behaviors in college students: Conditional indirect effects of depressive symptoms and mental health stigma. *Stigma and Health*, *4*(1), 98–106. https://doi.org/10.1037/sah0000125

Hopko, D. R., Lejuez, C. W., Ruggiero, K. J., & Eifert, G. H. (2003). Contemporary behavioral activation treatments for depression: Procedures, principles, and progress. *Clinical Psychology Review*, *23*(5), 699–717. https://doi.org/10.1016/s0272-7358(03)00070-9

Hopko, D. R., Robertson, S. M. C., & Colman, L. (2008). *Behavioral activation therapy for depressed cancer patients: Factors associated with treatment outcome and attrition*. https://psycnet.apa.org/fulltext/2009-04082-003.html

Horgan, A., Sweeney, J., Behan, L., & McCarthy, G. (2016). Depressive symptoms, college adjustment and peer support among undergraduate nursing and midwifery students. *Journal of Advanced Nursing*, *72*(12), 3081–3092. https://doi.org/10.1111/jan.13074

Hysenbegasi, A., Hass, S. L., & Rowland, C. R. (2005). The impact of depression on the academic productivity of university students. *The Journal of Mental Health Policy and Economics*, *8*(3), 145–151.

Ibrahim, A. K., Kelly, S. J., Adams, C. E., & Glazebrook, C. (2013). A systematic review of studies of depression prevalence in university students. *Journal of Psychiatric Research*, *47*(3), 391–400. https://doi.org/10.1016/j.jpsychires.2012.11.015

Kanter, J. W., Mulick, P. S., Busch, A. M., Berlin, K. S., & Martell, C. R. (2007). The behavioral activation for depression scale (BADS): Psychometric properties and factor structure. *Journal of Psychopathology and Behavioral Assessment*, *29*, 191–202. https://doi.org/10.1007/s10862-006-9038-5

Kazdin, A. E. (2007). Mediators and mechanisms of change in psychotherapy research. *Annual Review of Clinical Psychology*, *3*, 1–27. https://doi.org/10.1146/annurev.clinpsy.3.022806.091432

Kazdin, A. E. (2008). Evidence-based treatment and practice: New opportunities to bridge clinical research and practice, enhance the knowledge base, and improve patient care. *American Psychologist*, *63*(3), 146–159. https://doi.org/10.1037/0003-066x.63.3.146

Lewinsohn, P. M. (1974). A behavioral approach to depression. In J.C. Coyle (Ed.) *Essential papers on depression* (pp. 150–172). New York University Press.

Lipson, S. K., Kern, A., Eisenberg, D., & Breland-Noble, A. M. (2018). Mental health disparities among college students of color. *Journal of Adolescent Health*, *63*(3), 348–356. https://doi.org/10.1016/j.jadohealth.2018.04.014

Little, R. J. A. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association*, *83*(404), 1198–1202. https://doi.org/10.1080/01621459.1988.10478722

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the depression anxiety stress scales (DASS) with the Beck depression and anxiety inventories. *Behaviour Research and Therapy*, *33*(3), 335–343. https://doi.org/10.1016/0005-7967(94)00075-u

Lu, S., Hu, S., Guan, Y., Xiao, J., Cai, D., Gao, Z., Sang, Z., Wei, J., Zhang, X., & Margraf, J. (2018). Measurement invariance of the depression anxiety stress scales-21 across gender in a sample of Chinese university students. *Frontiers in Psychology*, *9*. https://doi.org/10.3389/fpsyg.2018.02064

Magidson, J. F., Andersen, L. S., Satinsky, E. N., Myers, B., Kagee, A., Anvari, M., & Joska, J. A. (2020). "Too much boredom isn't a good thing": Adapting behavioral activation for substance use in a resource-limited South African HIV care setting. *Psychotherapy*, *57*(1), 107–118. https://doi.org/10.1037/pst0000257

Manos, R. C., Kanter, J. W., & Luo, W. (2011). The behavioral activation for depression scale-short form: Development and validation. *Behavior Therapy*, *42*(4), 726–739. https://doi.org/10.1016/j.beth.2011.04.004

Martell, C. R., Addis, M. E., & Jacobson, N. S. (2001). *Depression in context: Strategies for guided action* (pp. Xxx–223). W W Norton & Co.

Martell, C. R., Dimidjian, S., & Herman-Dunn, R. (2010). *Behavioral activation for depression: A clinician's guide* (pp. Xvi, 220). Guilford Press.

Martin, F., & Oliver, T. (2018). Behavioral activation for children and adolescents: A systematic review of progress and promise. *European Child & Adolescent Psychiatry*, *28*(4), 427–441. https://doi.org/10.1007/s00787-018-1126-z

Mazzucchelli, T. G., Kane, R. T., & Rees, C. S. (2010). Behavioral activation interventions for well-being: A meta-analysis. *The Journal of Positive Psychology*, *5*(2), 105–121. https://doi.org/10.1080/17439760903569154

McIndoo, C. C., File, A. A., Preddy, T., Clark, C. G., & Hopko, D. R. (2016). Mindfulness-based therapy and behavioral activation: A randomized controlled trial with depressed college students. *Behaviour Research and Therapy*, *77*, 118–128. https://doi.org/10.1016/j.brat.2015.12.012

Paul, E. L., Manetas, M., Grady, K., & Vivona, J. (2001). The transitions program: A precollege advising and orientation workshop for students and parents. *NACADA Journal*, *21*(1–2), 76–87. https://doi.org/10.12930/0271-9517-21.1-2.76

Pedrelli, P., Borsari, B., Lipson, S. K., Heinze, J. E., & Eisenberg, D. (2016). Gender differences in the relationships among major depressive disorder, heavy alcohol use, and mental health treatment engagement among college students. *Journal of Studies on Alcohol and Drugs*, *77*(4), 620–628. https://doi.org/10.15288/jsad.2016.77.620

Pittman, L. D., & Richmond, A. (2008). University belonging, friendship quality, and psychological adjustment during the transition to college. *Journal of Experiential Education*, *76*(4), 343–362. https://doi.org/10.3200/jexe.76.4.343-362

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, *40*(3), 879–891. https://doi.org/10.3758/BRM.40.3.879

Proctor, E., Silmere, H., Raghavan, R., Hovmand, P., Aarons, G., Bunger, A., Griffey, R., & Hensley, M. (2011). Outcomes for implementation research: Conceptual distinctions, measurement challenges, and research agenda. *Administration and Policy in Mental Health*, *38*(2), 65–76. https://doi.org/10.1007/s10488-010-0319-7

Reynolds, E. K., Macpherson, L., Tull, M. T., Baruch, D. E., & Lejuez, C. W. (2011). Integration of the brief behavioral activation treatment for depression (BATD) into a college orientation program: Depression and alcohol outcomes. *Journal of Counseling Psychology*, *58*(4), 555–564. https://doi.org/10.1037/a0024634

Satinsky, E. N., Doran, K., Felton, J. W., Kleinman, M., Dean, D., & Magidson, J. F. (2020). Adapting a peer recovery coach-delivered behavioral activation intervention for problematic substance use in a medically underserved community in Baltimore City. *PLoS One*, *15*(1), e0228084. https://doi.org/10.1371/journal.pone.0228084

Solomonov, N., Bress, J. N., Sirey, J. A., Gunning, F. M., Flückiger, C., Raue, P. J., Areán, P. A., & Alexopoulos, G. S. (2019). Engagement in socially and interpersonally rewarding activities as a predictor of outcome in "Engage" behavioral activation therapy for late-life depression. *American Journal of Geriatric Psychiatry*, *27*(6), 571–578. https://doi.org/10.1016/j.jagp.2018.12.033

Zivin, K., Eisenberg, D., Gollust, S. E., & Golberstein, E. (2009). Persistence of mental health problems and needs in a college student population. *Journal of Affective Disorders*, *117*(3), 180–185. https://doi.org/10.1016/j.jad.2009.01.001

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