



Do participant, facilitator, or group factors moderate effectiveness of the *Body Project*? Implications for dissemination



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ABSTRACT

The *Body Project* is a dissonance-based selective eating disorder prevention program with a broad evidence-base. The study sought to determine if previous findings regarding participant moderators replicate in an effectiveness trial under more real-world conditions. This study also had the novel aim of examining facilitator characteristics and group-level variables as potential outcome predictors. These aims are critical for understanding when the intervention is most effective and for whom. Participants were 408 young women with body image concerns recruited from seven universities. Change in eating disorder symptoms at 1-year follow-up was the primary outcome. Intervention effects were significant for both participants who had low or high baseline symptom levels, but the effect size was approximately twice as large for participants with high initial symptom levels ($d = 0.58$ vs. 0.24). Intervention effects were not predicted by facilitator factors (education, age, BMI, sex) or by group size or attendance rate. This study demonstrates that participants with either low or high eating disorder symptoms will benefit from the intervention but if resources are limited, targeting those with elevated eating disorder symptoms may be sensible. Results also suggest that a wide variety of facilitators can effectively deliver the *Body Project*, which has encouraging implications for dissemination.

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A large proportion (13%) of young women experience DSM-5 eating disorders (Stice, Marti, & Rohde, 2013). Eating disorders are marked by chronicity, relapse and suffering in many domains, including emotional distress, functional impairment, psychiatric comorbidity, and early mortality (e.g., Arcelus, Mitchell, Wales, & Nielsen, 2011; Ben-Tovim et al., 2001; Fairburn, 2008; Swanson, Crow, Le Grange, Swendsen, & Merikangas, 2011). Prevention is critical not only because of the inherent importance of preventing this impairment and suffering, but also because treatment has both limited reach and efficacy (Bulik, 2013).

The *Body Project*, a selective prevention program targeting women who report body image concerns, is one of only two prevention interventions shown in efficacy trials to reduce risk for future onset of eating disorders over 2- and 3-year follow-up (the other being the *Healthy Weight Intervention*, a brief selective prevention program that has significantly reduced eating disorder onset through promoting small but sustainable improvements to dietary intake and physical activity; Stice, Marti, Spoor, Presnell, & Shaw, 2008; Stice, Rohde, Shaw, & Marti, 2012). The *Body Project*

uses cognitive dissonance strategies to reduce internalization of the thin-ideal through a series of written, behavioral, and verbal exercises during and between the four weekly group sessions. The *Body Project* has extensive evidence supporting its efficacy, both compared to control participants receiving no intervention and those in a time-matched alternate intervention (*Healthy Weight*), in terms of significantly greater reductions in eating disorder risk factors and symptoms, with some effects persisting 3 years (Stice, Marti, Spoor, et al., 2008; Stice, Rohde, Durant, & Shaw, 2012; Stice, Shaw, Burton, & Wade, 2006). Effects have been independently replicated (Becker, Smith, & Ciao, 2005; Halliwell & Diedrichs, 2014; Matusek, Wendt, & Wiseman, 2004; Mitchell, Mazzeo, Rausch, & Cooke, 2007), which increases confidence in the findings.

Two large effectiveness trials of the *Body Project* have been conducted (Stice, Butryn, Rohde, Shaw, & Marti, 2013; Stice, Rohde, Gau, & Shaw, 2009; Stice, Rohde, Shaw, & Gau, 2011), in which the program was delivered using endogenous providers under ecologically valid conditions. In the first effectiveness study, clinicians in high school settings were responsible for recruitment and intervention delivery. Participants randomly assigned to the *Body Project* demonstrated greater reductions than educational brochure

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control participants in eating disorder symptoms through 3-year follow-up (Stice et al., 2009, 2011), although differences in eating disorder onset were nonsignificant, perhaps because risk of onset was relatively lower than in the efficacy trial. The smaller effect size observed in the high school effectiveness trial, versus the efficacy trial, raises the question of how to maximize the impact of the *Body Project* when it is delivered in community settings. In the second effectiveness trial, clinicians at colleges delivered the intervention. Significant differences were observed at 1-year follow-up between intervention and brochure control participants in both risk factors and eating disorders symptoms (Stice, Butryn, et al., 2013; 2- and 3-year follow-up data collection is ongoing). Effects were 83% larger than those observed in the high school effectiveness trial. Possible explanations for this include use of an enhanced-dissonance version of the intervention script; improved selection, training, and supervising of clinicians; and the higher level of body dissatisfaction in the university sample, providing more opportunity for reductions in outcomes.

The present report examined potential factors that moderate the effects of the *Body Project* using data from this second effectiveness trial. Three categories of moderators were examined: participant-, facilitator-, and group-level factors. Examining moderators of intervention effects is critical for understanding under what circumstances the intervention is most effective, and for which individuals (Kraemer, Wilson, Fairburn, & Agras, 2002), which can guide refinement of inclusion and exclusion criteria to maximize the yield of prevention efforts, as well as to inform the design of alternative interventions those who do not benefit from the original intervention.

The first aim of this study was to determine if participant characteristics moderated the effectiveness of the intervention. We hypothesized that intervention effects would be stronger for participants with the highest levels of thin-ideal internalization, body dissatisfaction, and eating disorder symptoms, because these factors could provide greater motivation for change and facilitate the learning of intervention skills as they can be applied to address current risk factors. We also hypothesized that *Body Project* effects would be weaker for those with higher negative affect, as they had lower motivation to engage in the program, higher social anxiety, or less optimism for change. Previous research has identified significant participant moderators for eating disorder prevention programs. Moderator analyses of the *Healthy Weight* prevention program found greater effects for participants with elevated eating disorder symptoms at baseline (Stice, Rohde, Shaw, et al., 2012; 2013). A meta-analysis evaluation of *Student Bodies*, an eating disorder prevention program that focuses on improving body image and healthy dietary practices, found that changes in weight and shape concerns were larger in higher-risk groups than in lower-risk groups across multiple trials (Beintner, Jacobi, & Taylor, 2012). Moderator analyses from an efficacy trial of the *Body Project* found that participants with higher baseline levels of body image distress, eating disorder symptoms, and thin-ideal internalization benefited most from the intervention (Stice, Marti, Shaw, et al., 2008). Moderation analyses also have been conducted after combining data from three trials evaluating the *Body Project*. In those analyses, participants who had a DSM-5 eating disorder at baseline showed significantly greater pre-post reductions in eating disorder symptoms compared to those not meeting DSM-5 criteria at baseline ($d = .71$ and $.18$ respectively; Müller & Stice, 2013). Replication of these effects in an effectiveness study with college students is particularly important because such data would most directly inform dissemination efforts in those settings and because moderation effects are more difficult to detect than main intervention effects and hence more difficult to replicate (Brookes et al., 2004).

Participant demographic factors were also examined as part of Aim 1. Analyses examined participant age, ethnicity, and body mass index (BMI) as potential moderators. It is the responsibility of intervention developers to examine the generalizability of intervention effects, ideally ensuring that programs are effective for a broad range of individuals. Though we had no directional hypothesis regarding age effects, this effectiveness trial contained participants with a broader age range than previous efficacy research. Similarly, we anticipated no intervention effects as a function of race/ethnicity, given that none were detected in prior efficacy research (Rodriguez, Marchand, Ng, & Stice, 2008; Stice, Marti, & Cheng, 2014). Higher BMI was found to predict stronger eating disorder effects for the *Healthy Weight* intervention but not for the *Body Project* in prior efficacy research (Stice, Marti, Shaw, et al., 2008).

The second aim of the study was to determine if the following facilitator variables predicted participant response to the intervention: facilitator education level, facilitator age, facilitator BMI, and the presence of a male facilitator. As a broader range of clinicians deliver interventions in effectiveness compared to efficacy research, determining whether provider characteristics predict stronger versus weaker responses to the intervention is important. Very little research has examined moderators at the facilitator-level for this intervention, or more generally in eating disorder prevention or treatment research. It is important to understand if the effectiveness of intervention delivery depends on facilitator education level; one could hypothesize that facilitators with higher levels of education produce better outcomes because they have a higher level of competence delivering the material. It also is important to understand if the age, BMI, or sex of the facilitator is related to the effectiveness of intervention delivery, as it is unknown whether participants may react to those features of a facilitator in a way that impacts their response to the intervention. Previous research has found that health promotion messages to be more persuasive when they are delivered by individuals who are more similar to the average participant (e.g., Cialdini, 2008).

The third aim examined whether group size or average group attendance rate in that specific group predicted the improvements observed in individual participants in that group. It is unknown if groups that are smaller or larger are generally more or less effective in producing symptoms reduction effects. One could hypothesize that the extra opportunities for active participation (which is critical for cognitive dissonance induction) in a small group could be advantageous. Conversely, one could hypothesize that in a large group greater cognitive dissonance occurs because of the greater accountability of having a larger audience observe each individual speak out against the thin-ideal. The average group attendance rate could also impact effectiveness of the intervention for individual participants. If there is large drop-out in a group, the remaining participants may not benefit as much from discussions regarding costs of pursuing the thin ideal. Low attendance rates could also undermine group cohesion. Conversely, one could hypothesize that the voluntary nature of participation would be heightened in groups with poor attendance, which should theoretically maximize cognitive dissonance (e.g., “I must really care about this issue and want to change because I’m continuing to attend this group while others have dropped out”) and subsequently produce greater symptom reductions for individuals in those groups.

This is the first study to examine the degree to which facilitator- and group-level factors predict effects of the *Body Project* prevention program. As dissemination of this intervention becomes more widespread, there is likely to be more potential variability in participant, facilitator, and group-level factors, and thus examining whether these factors influence the effectiveness of the intervention is critical. Of note, this study was powered such that null effects

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