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**A pilot controlled trial of a cognitive dissonance-based body dissatisfaction intervention
with young British men**

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Abstract

This pilot study evaluated a body image intervention for men, *Body Project M*. Seventy-four British undergraduate men took part in two 90-min intervention sessions, and completed standardised assessments of body image, bulimic pathology, and related outcomes at baseline, post-intervention, and 3-month follow-up. Fifty-three other men completed the questionnaires as an assessment-only control group. Per-protocol analysis showed that *Body Project M* improved men's dissatisfaction with body fat and muscularity, body appreciation, muscularity enhancing behaviours, appearance comparisons, and internalization ($ds = 0.46 - 0.80$) at post-intervention. All except dissatisfaction with muscularity and internalization were sustained at 3-month follow-up. No effects were found for bulimic pathology. Post-intervention effects for dissatisfaction with muscularity and internalization only were retained under intention-to-treat analysis. Participants were favourable towards the intervention. This study provides preliminary evidence for the acceptability and post-intervention efficacy of *Body Project M*. Further development of the intervention is required to improve and sustain effects.

Keywords: men; body image; intervention; cognitive dissonance

A Pilot Controlled Trial of a Cognitive Dissonance-Based Body Dissatisfaction

Intervention with Young British Men

Recent research in the U.S., UK, and Australia suggests that a substantial proportion of men experience body dissatisfaction, including dissatisfaction with body fat, muscularity, hair, and height (e.g., Kruger, Lee, Ainsworth, & Macera, 2008; Silva, Nahas, de Sousa, Del Duca, & Peres, 2011; Tiggemann, Martins, & Churchett, 2008;). Body dissatisfaction, in particular weight and shape concerns, is the most potent modifiable risk factor for the development of some eating disorders among men and women (Jacobi & Fittig, 2010). Body dissatisfaction is also correlated with depression and muscle dysmorphia among men (Griffiths et al., 2016; Kanayama, Barry, Hudson, & Pope, 2006), and it can negatively impact on their day-to-day life. For example, this can include the avoidance of social situations where the body is undressed (e.g., swimming), avoiding sex, and not participating in school or work activities so as not to draw further attention to their appearances (Adams, Turner, & Bucks, 2005). It is therefore important that support and interventions are available for men experiencing body dissatisfaction.

Current Evidence for Body Image Interventions among Men

Systematic and meta-analytic reviews of psychosocial interventions designed to reduce body dissatisfaction indicate that, relative to women, few interventions have been evaluated among men. For example, Jarry and Ip (2005) conducted a meta-analysis of 19 studies that evaluated stand-alone cognitive-behaviour therapy interventions designed to reduce body dissatisfaction among non-clinical and clinical mixed-sex samples. It was unclear if these interventions were effective among men due to small male sample sizes. Specifically, only four studies in the meta-analysis included men, with a total of only 22 men recruited across all studies prohibiting moderator analyses by gender.

Similarly, Stice, Shaw, and Marti (2007) conducted a meta-analysis of studies evaluating 38 eating disorder prevention programs published between 1980 and 2003. They found eight of these interventions were delivered to mixed-sex samples, seven of which included adolescent boys and one that included college men. Three out of these eight interventions improved male participants' body dissatisfaction at immediate post-intervention, but there were no sustained effects at follow-up (O'Dea & Abraham, 2000; Richman, 1993, 1997). More recently, Yager and O'Dea (2008) systematically reviewed 27 body image interventions delivered to university students, a common target population for body image and eating disorder prevention interventions, and identified only one study that included men. In this study, 44 women and 16 men from a U.S. university took part in four weekly 90-minute sessions of psychoeducational and media literacy content (Rabak-Wagener, Eickhoff-Shemek, & Kelly-Vance, 1998). There were no improvements in body image among men who received the intervention relative to controls, with Rabak and colleagues suggesting that this was likely due to the intervention being designed specifically for women. Collectively, these reviews indicate that few body image interventions have been evaluated among men, and even fewer have been found to significantly improve men's body dissatisfaction.

Cognitive Dissonance Body Image Interventions

A cognitive dissonance-based body image intervention known as '*The Body Project*' has received the most consistent and substantial empirical support for improving body image and reducing disordered eating pathology among adolescent girls and young adult women (Stice, Marti, Spoor, Presnell, & Shaw, 2008), and may provide a fruitful avenue for future research with men. *The Body Project* has been researched extensively since 2000 under various labels, including '*Reflections: Body Image Program*[®]' when disseminated among sororities in the U.S., and '*The Succeed Body Image Programme*' when disseminated among

universities in the UK. *The Body Project* is based on cognitive dissonance theory (Festinger, 1957), and aims to induce cognitive dissonance among girls and young women by engaging them in counter-attitudinal written and behavioural exercises (e.g., role plays, group discussion, letter writing) that challenge the dominant thin-ideal standard of female beauty. Dissonance induction putatively reduces internalization of the thin-ideal, and subsequently reduces body dissatisfaction and eating pathology (Stice et al., 2008). Typically, *The Body Project* is delivered via two 2-hour sessions or four to six 45-minute sessions. *The Body Project* has been shown to be effective when delivered by psychologists, researchers, college health professionals, and university student peer-leaders primarily among selective samples of girls and women, although there are some studies with samples of both high- and low-risk participants (Stice, Becker, & Yokum, 2013).

To date, at least six independent research teams have provided empirical evidence for the efficacy and effectiveness of *The Body Project* in improving body image and reducing eating pathology among adolescent girls and young adult women. Studies have spanned clinical samples of U.S. women with eating disorders (Stice et al., 2008), U.S. female athlete students (Becker, McDaniel, Bull, Powell, & McIntyre, 2012), non-clinical samples of U.S. women and adolescent girls (Stice et al., 2008), Australian female university students (Cruwys, Haslam, Fox, & McMahon, 2015), and UK adolescent girls (Halliwell & Diedrichs, 2014; Halliwell, Jarman, McNamara, Risdon, & Jankowski, 2015). Body image improvements are typically sustained at follow-up, including 6-8 months (Stice et al., 2008), one, two, and three years (Stice et al., 2008; Stice, Rohde, Butryn, Shaw, & Marti, 2015).

Based upon the success of *The Body Project*, and the utility of dissonance-based interventions for other health issues among men (e.g., safe sex; Stone, Aronson, Crain, Winslow, & Fried, 1994), the potential for cognitive dissonance body image interventions among men appears promising. Some researchers have recently used cognitive dissonance

body image interventions among samples of men, although few have collected appropriate outcome data to assess intervention efficacy among men specifically (e.g., Feldman, Torino, & Swift, 2011; Ramirez, Perez, & Taylor, 2012).

Recently however, Brown and Keel (2015) conducted a pilot controlled trial to evaluate a version of *The Body Project* specifically designed for U.S. gay male undergraduate students. In *PRIDE: Body Image Program*, participants critiqued the mesomorphic appearance ideal for men, used different pronouns, and focused on LGBT specific appearance pressures in a two 2-hour session format. Forty-seven gay men took part in the intervention condition and 40 in the wait-list control condition. Intervention participants reported post-intervention reductions in appearance-ideal internalization, body dissatisfaction, self-objectification, romantic partner-objectification, dietary restraint, and bulimic symptoms compared to the control group. With the exception of ideal internalization, these improvements were maintained at 1-month follow-up. In addition, participants rated the intervention as highly acceptable and attrition was low. This study provided the first preliminary evidence to suggest that cognitive dissonance-based body image interventions may also be effective in improving body dissatisfaction among men.

Most recently U.S. undergraduate men (sexuality not reported) completed two sessions of '*Body Project 4 All*' in mixed-sex groups with undergraduate women (Kilpela et al., 2016). The two session 2-hour intervention was piloted among men in focus groups to adjust the format and content for relevance among men (e.g., reference was made not only to the thin ideal as the intervention does traditionally, but also to the mesomorphic ideal). The researchers measured eight outcomes among men in a pilot randomised controlled trial: negative affect, ideal internalization, eating disorder symptomatology, and dissatisfaction with body parts, muscularity, height, body fat, and global appearance. They found improvements in five of the eight outcomes among men: negative affect, dissatisfaction with

body parts, muscularity, body fat, and global appearance compared to a wait-list control condition immediately post-intervention. Maintained improvements at 2-month follow-up were observed on dissatisfaction with body parts, muscularity, body fat, and global appearance. Finally, these improvements were maintained at 6-month follow-up for dissatisfaction with body parts and body fat. This study provides further preliminary evidence to support the potential benefits of *The Body Project* among men, albeit in a mixed-sex delivery format.

Current Study

The aim of the current study was to further advance the evidence-base for body image interventions among men by conducting a pilot controlled evaluation of an adapted version of *The Body Project* (i.e., *Body Project M*) among a sample of British undergraduate men, recruited irrespective of their sexuality. Specifically, this study sought to assess the preliminary efficacy and acceptability of the intervention at immediate post-intervention and at 3-month follow-up on body image, bulimic pathology, and related psychosocial outcomes. Based on the prior pilot studies with men (Brown & Keel, 2015; Kilpela et al., 2016), we hypothesised that men who received *Body Project M* would report significant improvements on body image, disordered eating, and psychosocial outcomes compared to an assessment only control group at post-intervention and 3-month follow-up.

Method

Design and Participants

We conducted a pilot controlled trial with undergraduate men recruited from two universities in the UK. Due to timetabling constraints, random allocation to conditions was not possible. Men who were enrolled in psychology single major undergraduate degrees were allocated to the intervention condition, and men who were enrolled in psychology dual major degrees (e.g., psychology and criminology) were assigned to an assessment-only

control condition. The universities' ethics review boards approved the trial and participants provided informed consent.

Intervention

The cognitive dissonance body image intervention, '*Body Project M*', consisted of two 90-minute sessions (see Table 1 for a summary of the intervention content). The intervention manual was an adaptation of *The Succeed Body Image Programme* manual (Becker & Stice, 2011), the UK version of *The Body Project*, with permission from the original program authors, Drs Carolyn Becker and Eric Stice.

Adaptations to the original intervention manual included reducing the length of the intervention, in order to fit within the availability of the timetabled schedules of the two participating universities. Specifically, the intervention was shortened from two 2-hour sessions to two 90-minute sessions by omitting some activities (e.g., *voluntary commitment*, *verbal challenges*) and shortening other activities (e.g., *ice breaker*, *costs of the appearance ideal*, and *role plays*). The intervention content was also adapted to be more relevant to men. All intervention activities focused on challenging the current dominant 'male appearance ideal' as defined by participants in the first session, instead of the 'thin-ideal' (i.e., the dominant standard for female beauty challenged in *The Body Project* and *The Succeed Body Image Programme*). In addition, activity scenarios that were perceived to be stereotypically feminine were changed. For example, the original manual included references to "*diet soft drinks*" and "*elite fashion designers*". These were adapted to "*steroids*" and "*Men's Health magazine publisher*" respectively.

Key activities from *Body Project M* were piloted with three undergraduate men (separate from the sample who took part in the main trial) during a single 90-minute session. The participants were told that the aim of the session was to assess the acceptability and relevance of the intervention materials, and they were asked to provide constructive and

honest feedback. Generally, the activities were considered acceptable to these men. At participants' request, the language of some phrases in the manual was simplified.

Outcome Measures

Body fat dissatisfaction. The body fat dissatisfaction subscale of the validated Male Body Attitudes Scale-Revised (MBAS-R; Ryan, Morrison, Roddy, & McCutcheon, 2011; Tylka, Bergeron, & Schwartz, 2005) was administered (5 items; e.g., "*I feel excessively fat*"). Responses were rated on a 5-point Likert scale from 1 (rarely) to 5 (always). Scores were averaged so that higher scores indicated greater levels of dissatisfaction with body fat (range: 1-5). In the current study, internal consistency for the body fat dissatisfaction subscale scores were good (Cronbach's $\alpha = .89$).

Muscularity dissatisfaction. The muscularity dissatisfaction subscale of the Drive for Muscularity Scale (DMS; (McCreary & Sasse, 2000) was administered (7 items; e.g., "*I think that I would look better if I gained 10 pounds in bulk*"). Responses are rated on a 6-point Likert scale from 1 (always) to 6 (never). After appropriate reversal of some items, higher scores indicated greater dissatisfaction with muscularity (range: 1-6). Validity and reliability of the DMS has been established among university men's scores previously (Tylka, 2011). In the current study, the internal consistency of the muscularity dissatisfaction subscale scores was good (Cronbach's $\alpha = .93$).

Body appreciation. The Body Appreciation Scale (BAS; Avalos, Tylka, & Wood-Barcalow, 2005) is a 13-item measure that was used to assess positive body image and individuals' appreciation for their appearance. This measure was selected as it does not ask about specific aspects of appearance, meaning participants' body image that is not specific to muscularity and body fat can be captured. Example items include "*I respect my body*" and "*On the whole, I am satisfied with my body*". Responses are rated on a 5-point scale from 1 (never) to 5 (always). Items were averaged and higher scores indicated greater body

appreciation (range: 1-5). The validity and reliability of this measure has been established with men (Tylka, 2013). In the current study, internal consistency (Cronbach's $\alpha = .89$) was good.

Drive for muscularity behaviours. The engagement in muscularity enhancing behaviours subscale of the DMS was administered (8 items; e.g., "*I lift weights to build up muscle*"). Responses are rated on a 5-point scale from 1 (never) to 6 (always). After reversal of all items, higher scores indicated more engagement in drive for muscularity behaviours (range: 1-6). In the current study, the internal consistency (Cronbach's $\alpha = .89$) was good.

Bulimic pathology. Ten diagnostic items from the Eating Disorders Examination-Questionnaire (Fairburn & Beglin, 1994) were administered to assess bulimic behaviours of binge eating and purging: (e.g., "*Over the past 28 days, how many times have you made yourself sick (vomit) as a means of controlling your shape or weight?*" and "*Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight (whether or not you have succeeded?)*"). These items were selected to form a measure that minimised participant burden, and was consistent and comparable with the brief measure of bulimic pathology used in previous studies evaluating *The Body Project* among samples of women (e.g., Stice et al., 2008; Stice, Rohde, Shaw, & Gau, 2011). Higher scores indicated greater pathology (range: 0-60). Validity and reliability for these items have been reported previously among women (Becker, Diedrichs, Jankowski, & Werchan, 2013) and undergraduate men (Lavender, De Young, & Anderson, 2010). In the current study internal consistency (Cronbach's $\alpha = .77$) was acceptable.

Appearance comparisons. The Physical Appearance Comparison Scale (PACS; Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004) is a 5-item measure (e.g., "*At parties or other social events, I compare how I am dressed to how other people are dressed*") that was used to assess participants' tendency to compare their physical appearance to others.

Responses are rated on a 5-point scale from 1 (never) to 5 (always). After reverse scoring one item, scores are averaged with higher scores indicating a greater tendency to compare.

Validity and reliability of this measure has been established among university men (Tylka & Andorka, 2012). In the current study, internal consistency (Cronbach's $\alpha = .70$) was acceptable.

Internalization of cultural appearance ideals. Seven items from the Internalization subscale of the Sociocultural Attitudes Toward Appearance Questionnaire 3-Male (Thompson et al., 2004) were administered to assess the extent to which participants internalize current cultural appearance ideals for men (e.g., "*I believe that clothes look better on men who are in good physical shape*"). Responses were rated on a 5-point scale from 1 (completely disagree) to 5 (completely agree). Consistent with prior research assessing both internalisation and comparisons (Tylka & Andorka, 2012), four items from the original internalisation scale were not administered as they overlapped conceptually with the PACS (e.g., item 10: "*I often find myself comparing my physique to that of athletes pictured in magazines*"), and the purpose of this measure was to assess internalisation or appearance ideals, not appearance comparisons. After appropriate reversal of some items, item scores were averaged with higher scores indicating greater internalization (range: 1-5). In the current study, internal consistency (Cronbach's $\alpha = .86$) was good.

Participant intervention feedback. Two open-ended questions were included in the post-intervention questionnaire administered to men who took part in *Body Project M* to obtain their feedback on taking part in the intervention. Questions included "*Was the intervention useful? Please explain why/why not?*" and "*Is there anything about the intervention you think could be improved?*".

Fidelity measures. All intervention sessions were audio-recorded to assess proportion of the intervention delivered, facilitator adherence, and competence. Two trained research

assistants independently rated a random selection of 50% of the intervention session recordings using a standardised checklist. The checklist was modelled on Stice and colleagues' (Stice et al., 2015) fidelity assessment procedure. For proportion of the intervention delivered, raters recorded whether or not the facilitator delivered each question prompt and activity within each section of the manual. For adherence, each section of the intervention was rated on how closely the facilitator adhered to the manual using a 10-point Likert scale (1= *no adherence*; 10 = *perfect adherence*). For competence, the quality of the facilitator's delivery was rated across twelve items (e.g., the facilitator '*encouraged voluntary responses from participants*'; '*demonstrated enthusiasm for the material*') using a 5-point Likert scale (e.g., 1= *not at all*; 5 = *very much*). A mean score was calculated for competence ratings for each session, with higher scores indicating greater competence. Inter-rater reliability was good (ICCs= .73 - .92), suggesting that proportion of intervention content delivered, adherence, and competence were assessed consistently across sessions and raters.

Procedure

Participants were recruited via their psychology courses, emails, posters, and social networking websites at both universities. Participants taking part via their psychology courses were granted course credits for participating. Men were not recruited on the basis of pre-existing body image concerns and were made aware that declining to participate had no implications for their grades. Men in the intervention condition completed their pre-intervention questionnaire immediately before the first intervention session, and the post-intervention questionnaire immediately after the second intervention session. The two intervention sessions were 90-minutes long and were delivered one week apart by the first author, a White gay male PhD student in his mid-20s who had received training and coaching in dissonance-based interventions from the second and last author. The intervention group sizes ranged from 2-6 participants (*M* group size = 4). Participants completed the follow-up

questionnaire online three months after the second session had ended. Men in the assessment-only control condition completed online questionnaires at the same time of year, and in the same time sequence, as participants in the intervention condition.

Statistical analyses

Data screening and preparation. All outcomes were assessed for normality, univariate and multivariate outliers, missing data, and baseline equivalence between conditions using SPSS 22.0. Logarithmic transformations were applied to three significantly skewed outcomes (body fat dissatisfaction, drive for muscularity behaviours, and bulimic pathology) to normalise distributions. No univariate or multivariate outliers remained after transformations. Attrition resulted in significant missing data at post-intervention (29.1%) and 3-month follow-up (37.2%). Subsequent t-tests of missingness showed that dropout at both post-intervention and 3-month follow-up was significantly related to lower baseline internalization across all outcomes ($ps = .010 - .020$). Baseline equivalence on demographic and outcome measures was assessed using likelihood-ratio chi-square tests and t-tests, for categorical and continuous variables respectively.

Intervention effects. The effects of condition on outcomes were analysed using mixed models in STATA 14.0, in order to account for the nested nature of the data in 2-level models (repeated measures within individuals). Random intercept-only models were conducted for each outcome, containing a random intercept at the individual level and fixed effects for condition (control = 0, experimental = 1), time (post-intervention = 0, 3-month follow-up = 1), the condition x time interaction, and covariates including baseline outcome score and demographic variables to increase precision of model estimates. Significant condition effects were followed up with post-hoc between-group pairwise comparisons at both post-intervention and follow-up, adopting a corrected p value as the threshold for significance to reduce the family-wise error rate ($p = .05/2$ comparisons = .025). As

recommended for pre-post controlled designs (Morris, 2008), effect sizes (Cohen's d) for between-group pairwise comparisons were calculated by subtracting the pre to post-intervention/follow-up change score for the control group from the respective change score for the intervention group, and then dividing by the pooled standard deviation at baseline (small effect $d = 0.20$; medium effect $d = 0.50$, large effect $d = 0.80$).

Given the desire to evaluate preliminary intervention efficacy among men who completed the intervention in this pilot study rather than clinical effectiveness, as well as the indication that those who completed were potentially more reflective of men in need of body image interventions (i.e., those higher on internalisation), analyses were first conducted with complete cases in a per-protocol analysis ($N = 69$). We then conducted an intention-to-treat analysis on the full sample ($N = 110$).

Missing data. To retain all cases for intention-to-treat analysis, Multiple Imputation (MI) was used to handle missing data. Based on Little's missing completely at random (MCAR) test being significant ($p = .009$) and therefore not MCAR, and t-tests showing that missingness was significantly related to observable data at baseline, missing data was assumed to be conditionally missing at random (MAR), and therefore meeting assumptions for multiple imputation (Graham, 2009; Tabachnick & Fidell, 2007). Forty data sets were imputed (Graham, 2009), using the fully condition specification approach and Markov chain Monte Carlo (MCMC) methods as implemented in SPSS. All available variables (drop-out status, condition, demographic, and outcome variables) were included in the imputation model. Results presented reflect analyses conducted on each dataset and combined using Rubin's rules (Rubin, 1987) to produce pooled estimates.

Results

Participant Recruitment and Flow

Data collection occurred between September 2013 and January 2015. A total of 127 men were recruited to take part in the study. Of those who completed the first questionnaire and provided demographic information ($N = 110$), the majority were young (18 - 45 years, $M = 20.75$, $SD = 4.59$) and heterosexual (90.9 %). Most participants identified as British (95.5%) and White (87.3%). Except for age, the sample was roughly representative of people living in Britain according to the latest census data (Office for National Statistics, 2012). Attrition was significant at post-intervention (29.1%) and follow-up (37.2%), with dropout rates similar across conditions. See Figure 1 for participant recruitment and flow.

Baseline Characteristics

Descriptive statistics for demographic and outcome variables at baseline by condition are displayed in Table 2. No differences between conditions were found on any demographic or outcome variable.

Intervention Effects

Table 3 displays the model coefficients from mixed model analyses for all outcomes, representing fixed effects of condition, time, and the interaction between condition and time. Table 4 shows the estimated marginal means (adjusted for baseline score and demographic variables) by condition and time, along with significance of between-group pairwise comparisons and associated Cohen's d effect sizes, for both per-protocol ($N = 69$) and intention-to-treat ($N = 110$) analysis.

Per-protocol analysis. Significant effects of condition were found for all outcomes except bulimic pathology. Post-hoc pairwise comparisons indicated that intervention participants reported lower dissatisfaction with body fat and muscularity, drive for muscularity enhancing behaviours, appearance comparisons, internalization, and higher body appreciation at post-intervention, with medium to large effect sizes. These differences were

maintained at 3-month follow-up for dissatisfaction with body fat, body appreciation, drive for muscularity enhancing behaviours, and appearance comparisons.

Intention-to-treat analysis. Across outcomes, the pattern of results was weaker under an intention-to-treat approach (i.e., including all participants who dropped out after baseline). Mixed models showed significant effects of condition on dissatisfaction with muscularity and internalization only. Post-hoc pairwise comparisons showed that participants who received the intervention reported lower dissatisfaction with muscularity and internalization at post-intervention than control participants, with small effect sizes; however, these effects were not maintained at 3-month follow-up. No significant effects were observed for the other outcomes (dissatisfaction with body fat, body appreciation, drive for muscularity behaviours, bulimic pathology, and appearance comparisons).

Participant feedback.

The majority of the men who completed both sessions and gave intervention feedback (96%) reported that the intervention was useful. This was primarily because participants reported they thought the intervention gave men permission to share their frustration over appearance pressures. Other reasons given by participants for finding the intervention useful included; it raised awareness about an important issue; it was informal and there was an easy-going atmosphere in the groups; and it was informative. The two participants (4%) who did not think the intervention was useful were critical because they said they felt the intervention assumed that they had body image concerns when they did not. Although one of these men wrote “*it would have been useful for individuals who are conscious of their body*”.

Of the 37 participants who responded to the item “*Is there anything about the intervention you think could be improved?*”, 61% stated that nothing needed to be improved. Those who thought the intervention should be improved said the intervention should be less biased, less structured, take place with larger participant groups (due to scheduling issues, in

some groups there were only 2 participants), and that the topic should be explained more clearly before the intervention started.

Fidelity.

On average, the facilitator delivered 78.47% of the content in each session. Raters noted that the content skipped or condensed by the facilitator included introductory and concluding statements, and not reading out instructions that were duplicated on written hand-outs. Adherence to the sections delivered was rated as ‘good’ on average ($M = 7.23$; $SD = 2.68$). Provider competence was rated on average as ‘excellent’ ($M = 4.90$; $SD = 0.04$). Session ranged in length from 38-98 minutes, with an average time of 64 minutes for Session 1 ($SD = 19$) and 72 minutes for Session 2 ($SD = 11$).

Discussion

The cognitive dissonance-based body image intervention *The Body Project* has amassed extensive evidence for its efficacy and effectiveness in reducing women’s body image concerns and eating pathology, and has recently shown promise among undergraduate gay men (Becker & Stice, 2011; Brown & Keel, 2015; Stice, Presnell, Gau, & Shaw, 2007; Stice et al., 2015). The aim of this study was to conduct a pilot controlled trial to examine the efficacy and acceptability of a cognitive dissonance body image intervention, *Body Project M*, among a sample of undergraduate British men, recruited irrespective of their sexuality, on body image, eating pathology, and related outcomes.

Given this study’s focus on establishing preliminary efficacy and acceptability among men who complete the intervention, a per-protocol analysis was first conducted. Results revealed that men who took part in both sessions of *Body Project M* reported significant improvements at post-intervention on six of seven outcomes: dissatisfaction with body fat and muscularity, body appreciation, drive for muscularity enhancing behaviours, appearance comparisons, and internalization. Effect sizes were in the medium to large range across

outcomes (Cohen's d s = 0.46 - 0.80). Additionally, these effects were sustained at 3-month follow-up, except for dissatisfaction with muscularity and internalization. Given that participant dropout was related to lower baseline internalisation, it can be postulated that those who dropped out did not need the intervention or find it relevant (i.e., because they did not strongly identify with cultural appearance ideals, which the intervention focuses on challenging repeatedly). Thus the complete cases per-protocol analysis likely reflects intervention effects that may be achievable with framing the intervention as a selective intervention, rather than as a universal intervention as was implemented in this study.

Nevertheless, intention-to-treat analysis was conducted to provide an unbiased assessment with regard to overall effectiveness in this universal sample. A weaker pattern of results was observed overall, with significant improvements on dissatisfaction with muscularity and internalization of appearance ideals (small effect sizes), and at post-intervention only. This is unsurprising as the analysis included participants who did not complete the intervention, were potentially men for whom the intervention was less relevant as noted above, and because the use of multiple imputation inherently builds uncertainty into the models in order to remove bias from model estimates. Regardless, our effects under these conditions indicate that the intervention is less effective when provided to a non-selected, universal sample, in line with previous research (e.g., Stice et al., 2013).

There is little published data on expected effect sizes for body image interventions with men (e.g., Kilpela et al., 2016 did not report effect sizes). Brown and Keel (2015), however, found stronger effect sizes at 1-month follow-up (Cohen's d s = 0.63 – 1.00) on their outcomes than outcomes at 3-month follow-up in the current study (Per-Protocol: Cohen's d s = 0.30 – 0.62; Intention-to-treat: Cohen's d s = 0.09 – 0.17). This is possibly because the current study included mostly heterosexual men as opposed to gay men in Brown and Keel (research suggests gay men may be at greater risk for body image concerns and

therefore have greater capacity for intervention improvements; Morrison, Morrison, & Sager, 2004), but it may also be due to the different follow-up periods between the studies as discussed further below.

The observed improvements and effect sizes are positive given that this intervention was notably shorter than most other cognitive dissonance interventions that have been evaluated. The effects are also promising given the sample approximated a universal sample, in that participants were not recruited on the basis of having existing body image concerns or a specific desire for body image support, and therefore groups were of mixed levels of concerns. Nevertheless, our comparison of per-protocol and intention-to-treat analysis indicates that this intervention had stronger effects among men who completed the intervention, and that completing the intervention was associated with higher levels of pre-existing internalisation. Men who completed both sessions were overwhelmingly favourable about the intervention and its utility for improving their body image in response to the open-ended questions. Therefore, the results of this study suggest that *Body Project M* shows some promise as an acceptable intervention for men, but perhaps only for those who already identify with cultural appearance ideals. It is particularly important that the intervention was found to be acceptable to the men sampled, given the lack of research investigating men's reactions to, and preferences for, body image interventions. The findings contribute to recent evidence indicating that body dissatisfaction is a pertinent issue for men, and they contradict the stereotype that men are not interested in body image or related interventions (Griffiths et al., 2016). More research should be conducted, however, to understand reasons for, and strategies for overcoming, attrition and to strengthen and sustain intervention effects.

The lack of sustained effects at 3-month follow-up under intention-to-treat analysis was disappointing, but is consistent with the majority of prior research examining men's body image interventions (e.g., Stice et al., 2003). Interestingly, however, these results are

incongruent with the previous cognitive dissonance body image intervention trial (*PRIDE: Body Image Program*) conducted with undergraduate gay male students in the U.S. by Brown and Keel (2015). This study produced sustained improvements at 1-month follow-up on body dissatisfaction, dietary restraint, bulimic pathology, and objectification. Notably, however, our follow-up period was two months longer than this study. In addition, our completer's analysis indicated that men who took part in both intervention sessions reported sustained improvements in dissatisfaction with body fat and muscularity, body appreciation, drive for muscularity behaviours, and appearance comparisons at 3-months follow-up. Nevertheless, the recent evaluation of a mixed-sex dissonance-based intervention also found some sustained improvements on body image among men at 2- and 6- month follow-up (Kilpela et al., 2016). Consequently, further research evaluating *Body Project M* with a larger sample size at follow-up and better strategies to overcome attrition is required.

The fact that there were no improvements in bulimic pathology at post-intervention or follow-up (even within the per-protocol analysis) reinforces that there is room to improve the efficacy of this intervention. It may be that the intervention was too brief at 180 minutes to confer significant effects on disordered eating behaviours. Further, the removal of some elements of the original *Body Project* (e.g., the participant voluntary commitment at the start of each session, which is designed to increase dissonance induction) for practical reasons in the current study may have reduced intervention efficacy. *PRIDE: Body Image Program* produced improvements in eating pathology among gay undergraduate men and was 240 minutes in length (Brown & Keel, 2015). Notably, however, there is evidence among samples of adolescent girls and undergraduate women to suggest that dissonance-based interventions as brief as four 20-minute sessions (Halliwell & Diedrichs, 2014) or a single 2-hour session (Matusek, Wendt, & Wiseman, 2004) can confer benefits up to 1-month later. Nevertheless,

most dissonance-based body image interventions with sustained longer-term effects have tended to be 4-6 hours in length.

Alternatively, the intervention content could be refined to produce greater cognitive dissonance and to better address topics related to body image among men. Notably, cognitive dissonance-based body image interventions have been specifically designed to reduce internalization of cultural appearance ideals, in order to reduce body dissatisfaction and eating pathology. Although internalization of appearance ideals has been well-established as a prospective risk factor for body dissatisfaction and eating pathology among women (Thompson, Covert, & Stormer, 1999), the evidence for the role of internalization of appearance ideals in the development of men's body image concerns and eating pathology is less established. It may be that other variables (e.g., conformity to masculine norms) also need to be targeted to confer body image and eating pathology improvements among men. Furthermore, intervention group sizes were reasonably small in the current study, which may have limited potential for vicarious cognitive dissonance and individual's own cognitive dissonance as a result of speaking out in front fewer people than in other comparable intervention studies (e.g., Brown & Keel, 2015; Kilpela et al. 2016). Furthermore, the smaller group sizes are likely to have resulted in some of the sessions being briefer than intended (i.e., M session length = 68 minutes).

Another potential explanation for the lack of effects on bulimic pathology specifically could be that our participants were scoring fairly low on this outcome at baseline, and therefore there may have been little room for improvement. Among participants in the intervention condition, bulimic pathology was low at baseline ($M = 9.03$, $SD = 8.43$, range = 0-34) with the scale ranging from 0 - 60. Therefore, it is possible that bulimic pathology did not improve in the intervention due to floor effects. Alternatively, bulimic pathology may not have improved in the intervention condition because this was more peripheral than other

outcomes in relation to the intervention's content. In addition, our measure of eating pathology was originally designed for women and may not be as relevant to men.

Specifically, the appearance ideal for men is lean *and* muscular, therefore men may engage in disordered behaviours to gain muscle (e.g., very high protein, low fat diets), which is not captured in current eating pathology measures (Pope et al., 2000; Tylka, 2011). As this was a pilot study, it is evident that further research is needed to explore the efficacy of this intervention on men's body image and eating pathology prior to dissemination.

This study had a number of important strengths. These include the use of validated body image measures specifically designed for, and/or validated among men. Furthermore, the assessment of facilitator fidelity and adherence to the intervention enhanced the methodological rigour of the study, provided important context within which to interpret the findings, and increased confidence that the intervention was mostly delivered as intended. The assessment of men's reactions to the intervention to better understand the acceptability of dissonance approaches for body image among men was especially important, considering that this is one of the first studies to examine the utility of this type of body image intervention among a broad sample of men. We also conducted comprehensive analysis by taking per-protocol and intention-to-treat approaches, and utilising multiple imputation to handle missing data.

Nevertheless, this small-scale pilot study has a number of limitations that future research will need to address before cognitive dissonance body image interventions can be firmly established as a useful intervention technique for men. Most importantly, although participants in the intervention and control conditions were recruited from similar settings (i.e., both were enrolled in psychology degrees of some kind) and they were not significantly different from one another at baseline on demographic and outcome measures, this study relied on an opportunity sample and due to practical constraints it was not possible to

randomize participants to conditions. Therefore, future research with random allocation is greatly needed. Further limitations of this study are the self-report nature of the measures, and the fact that the intervention facilitator was also the lead researcher.

Conclusion

The results of this study provide preliminary evidence that a brief cognitive dissonance-based body image intervention, *Body Project M*, is acceptable to men and is beneficial for improving men's body image and associated outcomes. However, the intervention is likely to particularly benefit men who endorse higher internalization of cultural appearance ideals. These findings are promising, as support for past body image interventions evaluated among men has been lacking. Nevertheless, before considering dissemination of *Body Project M* and other cognitive dissonance approaches for men more broadly, further development and larger-scale rigorous evaluation is required, in order to strengthen and sustain intervention effects and to replicate findings consistently across trials.

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References

- Adams, G., Turner, H., & Bucks, R. (2005). The experience of body dissatisfaction in men. *Body Image*, 2, 271–283. <https://doi.org/10.1016/j.bodyim.2005.05.004>
- Avalos, L., Tylka, T. L., & Wood-Barcalow, N. (2005). The Body Appreciation Scale: Development and psychometric evaluation. *Body Image*, 2, 285–297. <https://doi.org/10.1016/j.bodyim.2005.06.002>
- Becker, C. B., Diedrichs, P. C., Jankowski, G. S., & Werchan, C. (2013). I’m not just fat, I’m old: Has the study of body image talk overlooked “old talk?” *The Journal of Eating Disorders*, 1, 1–12. <https://doi.org/10.1186/2050-2974-1-6>
- Becker, C. B., McDaniel, L., Bull, S., Powell, M., & McIntyre, K. (2012). Can we reduce eating disorder risk factors in female college athletes? A randomized exploratory investigation of two peer-led interventions. *Body Image*, 9, 31–42. <https://doi.org/10.1016/j.bodyim.2011.09.005>
- Becker, C. B., & Stice, E. (2011). *Succeed: Body image programme manual*. Oxford, UK: Oxford University Press.
- Brown, T. A., & Keel, P. K. (2015). A randomized controlled trial of a peer co-led dissonance-based eating disorder prevention program for gay men. *Behaviour Research and Therapy*, 74, 1–10. <https://doi.org/10.1016/j.brat.2015.08.008>
- Cruwys, T., Haslam, S. A., Fox, N. E., & McMahon, H. (2015). “That’s not what we do”: Evidence that normative change is a mechanism of action in group interventions. *Behaviour Research and Therapy*, 65, 11–17. <https://doi.org/10.1016/j.brat.2014.12.003>
- Fairburn, C. G., & Beglin, S. J. (1994). Assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders*, 16, 363–370.

[https://doi.org/10.1002/1098-108X\(199412\)16:4<363::AID-](https://doi.org/10.1002/1098-108X(199412)16:4<363::AID-)

[EAT2260160405>3.0.CO;2-#](https://doi.org/10.1002/1098-108X(199412)16:4<363::AID-EAT2260160405>3.0.CO;2-#)

Feldman, M. B., Torino, J. A., & Swift, M. (2011). A group intervention to improve body image satisfaction and dietary habits in gay and bisexual men living with HIV/AIDS.

Eating Disorders, 19, 377–391. <https://doi.org/10.1080/10640266.2011.609084>

Festinger, L. (1957). *A theory of cognitive dissonance*. Evanston, Illinois: Row, Peterson and Company.

Field, A. P. (2009). *Discovering statistics using SPSS: (and sex, drugs and rock'n'roll)*.

London: Sage Publications.

Graham, J. W. (2009). Missing data analysis: Making it work in the real world. *Annual*

Review of Psychology, 60(1), 549–576.

<https://doi.org/10.1146/annurev.psych.58.110405.085530>

Griffiths, S., Hay, P., Mitchison, D., Mond, J. M., McLean, S. A., Rodgers, B., ... Paxton, S.

J. (2016). Sex differences in the relationships between body dissatisfaction, quality of life and psychological distress. *Australian and New Zealand Journal of Public Health*.

<https://doi.org/10.1111/1753-6405.12538>

Halliwel, E., & Diedrichs, P. C. (2014). Testing a dissonance body image intervention among young girls. *Health Psychology*, 33, 201–204.

<https://doi.org/10.1037/a0032585>

Halliwel, E., Jarman, H., McNamara, A., Risdon, H., & Jankowski, G. S. (2015).

Dissemination of evidence-based body image interventions: A pilot study into the effectiveness of using undergraduate students as interventionists in secondary schools.

Body Image, 14, 1–4. <https://doi.org/10.1016/j.bodyim.2015.02.002>

- Jacobi, C., & Fittig, E. (2010). Psychosocial risk factors for eating disorders. In S. W. Agras, *The Oxford handbook of eating disorders* (pp. 123–136). New York: Oxford University Press.
- Jarry, J. L., & Ip, K. (2005). The effectiveness of stand-alone cognitive-behavioural therapy for body image: A meta-analysis. *Body Image*, 2, 317–331.
<https://doi.org/10.1016/j.bodyim.2005.10.001>
- Kanayama, G., Barry, S., Hudson, J. I., & Pope Jr., H. G. (2006). Body image and attitudes toward male roles in anabolic-androgenic steroid users. *American Journal of Psychiatry*, 163, 697–703. <https://doi.org/10.1176/appi.ajp.163.4.697>
- Kilpela, L. S., Blomquist, K., Verzijl, C., Wilfred, S., Beyl, R., & Becker, C. B. (2016). The body project 4 all: A pilot randomized controlled trial of a mixed-gender dissonance-based body image program. *International Journal of Eating Disorders*, 49, 591-602.
<https://doi.org/10.1002/eat.22562>
- Kruger, J., Lee, C.D., Ainsworth, B. E., & Macera, C. A. (2008). Body size satisfaction and physical activity levels among men and women. *Obesity*, 16, 1976–1979.
<https://doi.org/10.1038/oby.2008.311>
- Lavender, J. M., De Young, K. P., & Anderson, D. A. (2010). Eating Disorder Examination Questionnaire (EDE-Q): Norms for undergraduate men. *Eating Behaviors*, 11, 119–121. <https://doi.org/10.1016/j.eatbeh.2009.09.005>
- Matusek, J. A., Wendt, S. J., & Wiseman, C. V. (2004). Dissonance thin-ideal and didactic healthy behavior eating disorder prevention programs: Results from a controlled trial. *International Journal of Eating Disorders*, 36(4), 376–388.
<https://doi.org/10.1002/eat.20059>

- McCreary, D. R., & Sasse, D. K. (2000). An exploration of the drive for muscularity in adolescent boys and girls. *Journal of American College Health*, 48, 297–304.
<https://doi.org/10.1080/07448480009596271>
- Morrison, M. A., Morrison, T. G., & Sager, C. L. (2004). Does body dissatisfaction differ between gay man and lesbian women and heterosexual men and women? A meta-analytic review. *Body Image*, 1(2), 127–138.
<https://doi.org/10.1016/j.bodyim.2004.01.002>
- O’Dea, J. A., & Abraham, S. (2000). Improving the body image, eating attitudes, and behaviors of young male and female adolescents: A new educational approach that focuses on self-esteem. *The International Journal of Eating Disorders*, 28, 43–57.
[https://doi.org/10.1002/\(SICI\)1098-108X\(200007\)28:1<43::AID-EAT6>3.0.CO;2-D](https://doi.org/10.1002/(SICI)1098-108X(200007)28:1<43::AID-EAT6>3.0.CO;2-D)
- Office for National Statistics. (2012, March 29). Census data [Text]. Retrieved October 16, 2013, from <http://www.ons.gov.uk/ons/guide-method/census/2011/census-data/index.html>
- Pope Jr., H. G., Gruber, A. J., Mangweth, B., Bureau, B., deCol, C., & Jouvent, R. (2000). Body image perception among men in three countries. *American Journal of Psychiatry*, 157, 1297–1301. <https://doi.org/10.1176/appi.ajp.157.8.1297>
- Rabak-Wagener, J., Eickhoff-Shemek, J., & Kelly-Vance, L. (1998). The effect of media analysis on attitudes and behaviors regarding body image among college students. *Journal of American College Health*, 47, 29–35.
<https://doi.org/10.1080/07448489809595616>
- Ramirez, A. L., Perez, M., & Taylor, A. (2012). Preliminary examination of a couple-based eating disorder prevention program. *Body Image*, 9, 324–333.
<https://doi.org/10.1016/j.bodyim.2012.04.006>

Richman, R. D. (1993). *Primary prevention of eating disorders: A pilot program*. Burnaby, British Columbia, Canada: Simon Fraser University.

Richman, R. D. (1997). *Preventing disordered eating: Promoting healthy attitudes and behaviours: A school-based program*. (Vol. 52(6) 0425B). Dissertation Abstracts International.

Rubin, D. B. (1987). *Multiple imputation for nonresponse in surveys*. New York: Wiley.

Ryan, T. A., Morrison, T. G., Roddy, S., & McCutcheon, J. (2011). Psychometric properties of the Revised Male Body Attitudes Scale among Irish men. *Body Image*, 8, 64–69. <https://doi.org/10.1016/j.bodyim.2010.10.004>

Silva, D. A. S., Nahas, M. V., de Sousa, T. F., Del Duca, G. F., & Peres, K. G. (2011). Prevalence and associated factors with body image dissatisfaction among adults in Southern Brazil: A population-based study. *Body Image*, 8, 427–431. <https://doi.org/10.1016/j.bodyim.2011.05.009>

Stice, E., Becker, C. B., & Yokum, S. (2013). Eating disorder prevention: Current evidence-base and future directions. *The International Journal of Eating Disorders*, 46, 478–485. <https://doi.org/10.1002/eat.22105>

Stice, E., Marti, N. C., Spoor, S., Presnell, K., & Shaw, H. (2008). Dissonance and healthy weight eating disorder prevention programs: Long-term effects from a randomized efficacy trial. *Journal of Consulting and Clinical Psychology*, 76, 329–340. <https://doi.org/10.1037/0022-006X.76.2.329>

Stice, E., Presnell, K., Gau, J., & Shaw, H. (2007). Testing mediators of intervention effects in randomized controlled trials: An evaluation of two eating disorder prevention programs. *Journal of Consulting and Clinical Psychology*, 75, 20–32. doi: 10.1037/0022-006X.75.1.20

- Stice, E., Rohde, P., Butryn, M. L., Shaw, H., & Marti, C. N. (2015). Effectiveness trial of a selective dissonance-based eating disorder prevention program with female college students: Effects at 2- and 3-year follow-up. *Behaviour Research and Therapy*, 71, 20–26. <https://doi.org/10.1016/j.brat.2015.05.012>
- Stice, E., Rohde, P., Shaw, H., & Gau, J. (2011). An effectiveness trial of a selected dissonance-based eating disorder prevention program for female high school students: Long-term effects. *Journal of Consulting and Clinical Psychology*, 79, 500–508. <https://doi.org/10.1037/a0024351>
- Stice, E., Shaw, H., & Marti, C. N. (2007). A meta-analytic review of eating disorder prevention programs: Encouraging findings. *Annual Review of Clinical Psychology*, 3, 207–231. <https://doi.org/10.1146/annurev.clinpsy.3.022806.091447>
- Stone, J., Aronson, E., Crain, A. L., Winslow, M. P., & Fried, C. B. (1994). Inducing hypocrisy as a means of encouraging young adults to use condoms. *Personality and Social Psychology Bulletin*, 20, 116–128. <https://doi.org/10.1177/0146167294201012>
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics*. Pearson/Allyn & Bacon.
- Thompson, J. K., Coover, M. D., & Stormer, S. M. (1999). Body image, social comparison, and eating disturbance: A covariance structure modeling investigation. *International Journal of Eating Disorders*, 26, 43–51. [https://doi.org/10.1002/\(SICI\)1098-108X\(199907\)26:1<43::AID-EAT6>3.0.CO;2-R](https://doi.org/10.1002/(SICI)1098-108X(199907)26:1<43::AID-EAT6>3.0.CO;2-R)
- Thompson, J. K., van den Berg, P., Roehrig, M., Guarda, A. S., & Heinberg, L. J. (2004). The Sociocultural Attitudes Towards Appearance Scale-3 (SATAQ-3): Development and validation. *International Journal of Eating Disorders*, 35, 293–304. <https://doi.org/10.1002/eat.10257>

- Tiggemann, M., Martins, Y., & Churchett, L. (2008). Beyond muscles: Unexplored parts of men's body image. *Journal of Health Psychology, 13*(8), 1163–1172.
<https://doi.org/10.1177/1359105308095971>
- Tylka, T. L. (2011). Refinement of the tripartite influence model for men: Dual body image pathways to body change behaviors. *Body Image, 8*, 199–207.
<https://doi.org/10.1016/j.bodyim.2011.04.008>
- Tylka, T. L. (2013). Evidence for the Body Appreciation Scale's measurement equivalence/invariance between U.S. college women and men. *Body Image, 10*, 415–418. <https://doi.org/10.1016/j.bodyim.2013.02.006>
- Tylka, T. L., & Andorka, M. J. (2012). Support for an expanded tripartite influence model with gay men. *Body Image, 9*, 51–67. <https://doi.org/10.1016/j.bodyim.2011.09.006>
- Tylka, T. L., Bergeron, D., & Schwartz, J. P. (2005). Development and psychometric evaluation of the Male Body Attitudes Scale (MBAS). *Body Image, 2*, 161–175.
<https://doi.org/10.1016/j.bodyim.2005.03.001>
- Yager, Z., & O'Dea, J. A. (2008). Prevention programs for body image and eating disorders on University campuses: A review of large, controlled interventions. *Health Promotion International, 23*, 173–189. <https://doi.org/10.1093/heapro/dan004>

Table 1. Summary of ‘*Body Project M*’ content.

Session	Content
1	<ul style="list-style-type: none"> • Introduction to the program and icebreaker exercise. • Defining the appearance ideal, and exploring its origins and costs. • Identifying appearance pressures and those who benefit from promoting the appearance ideal. • Setting homework exercises (mirror exercise, writing a letter to younger self or male relative critiquing the appearance ideal, and a body image behavioural challenge).
2	<ul style="list-style-type: none"> • Review of homework exercises. • Role-plays to practice resisting pressures to pursue the appearance ideal. • Challenging body talk (e.g., “I need big arms”) • Resisting future appearance pressures through quick comeback statements.

Table 2. Baseline characteristics, by condition.

		Control (<i>n</i> = 51) (<i>M</i>, <i>SD</i>)	Intervention (<i>n</i> = 59) (<i>M</i>, <i>SD</i>)	<i>t</i> (<i>p</i>)
<i>Demographics</i>				
Age		20.67 (4.73)	20.81 (4.50)	-0.17 (.868)
British (<i>n</i> , %)		49 (96.1)	56 (94.9)	0.09 (.769) ^a
Sexualized (<i>n</i> , %)		4 (7.80)	6 (10.2)	0.18 (.671) ^a
Racialized (<i>n</i> , %)		9 (17.6)	5 (8.5)	2.08 (.149) ^a
<i>Outcomes</i>				
Body fat dissatisfaction	1-5	2.36 (1.09)	2.32 (1.11)	0.10 (.919)
Muscularity dissatisfaction	1-6	3.64 (1.29)	3.42 (1.23)	0.91 (.364)
Body appreciation	1-5	3.57 (0.72)	3.47 (0.7)	0.70 (.483)
Muscularity behaviours	1-6	2.14 (1.09)	2.05 (1.08)	0.38 (.706)
Bulimic pathology	0-60	9.51 (8.36)	8.61 (8.55)	0.28 (.784)
Appearance comparisons	1-5	2.72 (0.73)	2.75 (0.77)	-0.20 (.840)
Internalization	1-5	3.37 (0.83)	3.21 (0.94)	0.89 (.374)

Note: ^atest statistics and *p*-values for categorical variables are based on likelihood ratio chi-squared tests

Table 3. Adjusted means and standard errors for each outcome by condition and time, with between-group pairwise comparisons and associated Cohen's *d* effect sizes, for both intention-to-treat and complete cases analysis

Outcome	Per-Protocol				Intention-to-Treat			
	Control (<i>n</i> = 34) <i>M</i> (<i>SE</i>)	Intervention (<i>n</i> = 35) <i>M</i> (<i>SE</i>)	<i>p</i>	<i>d</i> [95% <i>CI</i>]	Control (<i>n</i> = 51) <i>M</i> (<i>SE</i>)	Intervention (<i>n</i> = 59) <i>M</i> (<i>SE</i>)	<i>p</i>	<i>d</i> [95% <i>CI</i>]
Body fat dissatisfaction ^a								
<i>Post-intervention</i>	0.33 (0.02)	0.25 (0.02)	.003	-0.56 [-0.59, -0.53]	0.33 (0.03)	0.31 (0.03)	.569	-0.09 [-0.14, -0.05]
<i>3-month follow-up</i>	0.35 (0.02)	0.27 (0.02)	.005	-0.53 [-0.56, -0.50]	0.33 (0.03)	0.31 (0.03)	.608	-0.10 [-0.15, -0.05]
Muscularity dissatisfaction								
<i>Post-intervention</i>	3.57 (0.13)	2.85 (0.13)	<.001	-0.76 [-0.94, -0.59]	3.52 (0.21)	2.95 (0.21)	.016	-0.36 [-0.66, -0.07]
<i>3-month follow-up</i>	3.56 (0.13)	3.17 (0.13)	.027	-0.42 [-0.60, -0.24]	3.50 (0.16)	3.26 (0.16)	.269	-0.15 [-0.45, 0.14]
Body appreciation								
<i>Post-intervention</i>	3.62 (0.08)	3.90 (0.08)	.016	0.46 [0.35, 0.57]	3.53 (0.14)	3.62 (0.14)	.565	0.08 [-0.11, 0.28]
<i>3-month follow-up</i>	3.56 (0.08)	3.93 (0.08)	.001	0.62 [0.51, 0.73]	3.65 (0.11)	3.83 (0.10)	.227	0.17 [-0.03, 0.37]
Muscularity behaviours ^a								
<i>Post-intervention</i>	0.28 (0.02)	0.20 (0.02)	.003	-0.56 [-0.59, -0.53]	0.26 (0.03)	0.23 (0.03)	.365	-0.15 [-0.19, -0.10]
<i>3-month follow-up</i>	0.31 (0.02)	0.23 (0.02)	.001	-0.61 [-0.64, -0.58]	0.30 (0.04)	0.27 (0.03)	.532	-0.12 [-0.17, -0.08]
Bulimic pathology ^a								
<i>Post-intervention</i>	0.85 (0.04)	0.80 (0.04)	.383	-0.17 [-0.23, -0.11]	0.84 (0.06)	0.84 (0.07)	.926	0.01 [-0.08, 0.11]
<i>3-month follow-up</i>	0.80 (0.04)	0.72 (0.04)	.177	-0.26 [-0.32, -0.20]	0.75 (0.06)	0.76 (0.06)	.966	0.01 [-0.09, 0.10]
Appearance comparisons								
<i>Post-intervention</i>	2.87 (0.09)	2.53 (0.09)	.007	-0.51 [-0.64, -0.39]	2.85 (0.14)	2.63 (0.15)	.213	-0.21 [-0.40, -0.01]
<i>3-month follow-up</i>	2.91 (0.09)	2.62 (0.09)	.021	-0.44 [-0.57, -0.31]	2.84 (0.11)	2.70 (0.11)	.407	-0.12 [-0.32, 0.07]
Internalization								
<i>Post-intervention</i>	3.40 (0.09)	2.90 (0.08)	<.001	-0.80 [-0.93, -0.69]	3.28 (0.16)	2.81 (0.17)	.009	-0.37 [-0.60, -0.13]
<i>3-month follow-up</i>	3.50 (0.09)	3.31 (0.08)	0.11	-0.30 [-0.42, -0.19]	3.46 (0.13)	3.34 (0.12)	.501	-0.09 [-0.33, 0.14]

Note. ^aLog transformed variables; Cohen's *d*, small effect = 0.20; medium effect = 0.50, large effect = 0.80; Bolded items are significant at *p* < .025

Table 4. Model coefficients for fixed effects of condition, time, and condition x time interaction, for intention-to-treat and complete cases analyses.

	Per-Protocol		Intention-to-Treat	
	<i>b</i> (SE)	<i>t</i> (<i>p</i>)	<i>b</i> (SE)	<i>t</i> (<i>p</i>)
Body fat dissatisfaction ^a				
<i>Condition</i>	-0.08 (0.03)	-2.95 (.003)	-0.02 (0.04)	-0.57 (.569)
<i>Time</i>	0.02 (0.02)	0.90 (.366)	0.001 (0.04)	-0.03 (.978)
<i>Condition x Time</i>	0.004 (0.02)	0.17 (.861)	0.0008 (0.04)	-0.02 (.986)
Muscularity dissatisfaction				
<i>Condition</i>	-0.72 (0.18)	-4.01 (<.001)	-0.57 (0.23)	-2.42 (.016)
<i>Time</i>	0.004 (0.13)	-0.03 (.974)	-0.02 (0.22)	-0.08 (.935)
<i>Condition x Time</i>	0.32 (0.18)	1.78 (.074)	0.32 (0.25)	1.29 (.197)
Body appreciation				
<i>Condition</i>	0.28 (0.12)	2.40 (.016)	0.09 (0.16)	0.58 (.565)
<i>Time</i>	-0.06 (0.09)	-0.73 (.467)	0.12 (0.16)	0.77 (.445)
<i>Condition x Time</i>	0.10 (0.12)	0.79 (.430)	0.09 (0.19)	0.48 (.633)
Muscularity behaviours ^a				
<i>Condition</i>	-0.07 (0.03)	-2.94 (.003)	-0.04 (0.04)	-0.91 (.365)
<i>Time</i>	0.03 (0.02)	1.53 (.127)	0.04 (0.04)	0.95 (.343)
<i>Condition x Time</i>	-0.01 (0.03)	-0.22 (.826)	0.01 (0.06)	0.09 (.928)
Bulimic pathology ^a				
<i>Condition</i>	-0.05 (0.06)	-0.87 (.383)	0.01 (0.08)	0.09 (.926)
<i>Time</i>	-0.06 (0.06)	-0.98 (.326)	-0.08 (0.08)	-1.03 (.302)
<i>Condition x Time</i>	-0.03 (0.08)	-0.36 (.720)	0.004 (0.11)	-0.03 (.974)
Appearance comparisons				
<i>Condition</i>	-0.34 (0.13)	-2.68 (.007)	-0.22 (0.17)	-1.25 (.213)
<i>Time</i>	0.05 (0.08)	0.56 (.576)	-0.01 (0.13)	-0.08 (.936)
<i>Condition x Time</i>	0.05 (0.12)	0.41 (.681)	0.09 (0.17)	0.52 (.605)
Internalization				
<i>Condition</i>	-0.51 (0.12)	-4.23 (<.001)	-0.46 (0.18)	-2.62 (.009)
<i>Time</i>	0.09 (0.09)	1.08 (.281)	0.18 (0.18)	1.00 (.318)
<i>Condition x Time</i>	0.32 (0.12)	2.56 (.010)	0.34 (0.19)	1.76 (.079)

Note: ^aLog transformed variables; Bolded items indicate significance at $p < .05$.

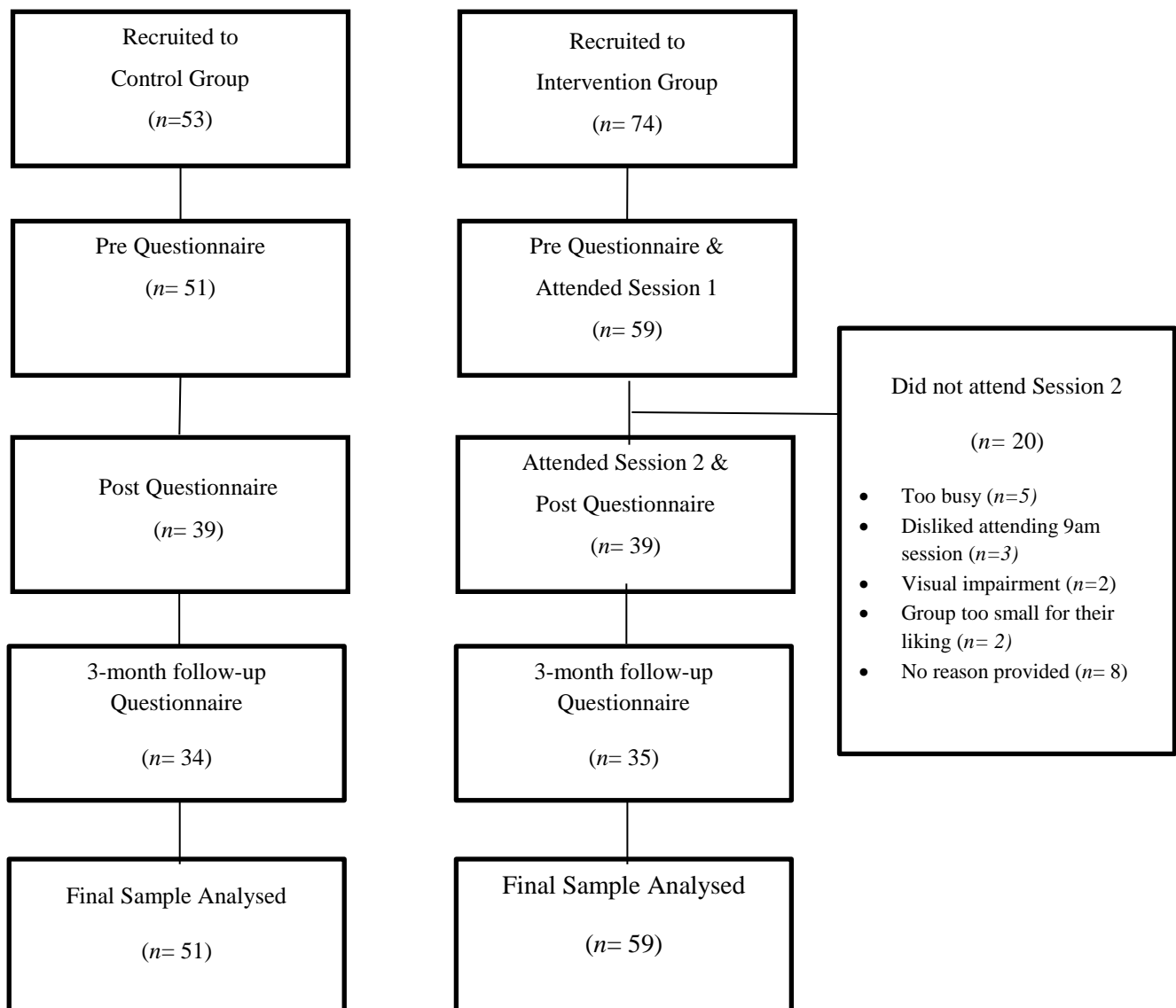


Figure 1. CONSORT flowchart showing participant movement throughout study.