Body Image in Primary Schools: A pilot evaluation of a primary school intervention program designed by teachers to improve children's body satisfaction

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Abstract

Body Image in the Primary School (Hutchinson & Calland, 2011) is a body image curriculum that is widely available but has not yet been evaluated. This study evaluates a set of 6 of the 49 available lessons from this curriculum. Seventy-four girls and 70 boys aged 9-10 were recruited from four primary schools in the UK. Schools were randomly allocated into the intervention condition, where students received 6 hours of body image lessons, or to lessons as normal. Body esteem was significantly higher among girls in the intervention group, compared to the control group, immediately post intervention, and at 3 month follow-up. Moreover, girls with lowest levels of body esteem at baseline reported the largest gains. Internalization was significantly lower among boys in the control group compared to the intervention group at 3 month follow-up. The pattern of results among the control group raises interesting issues for intervention evaluation.

Keywords: Children, interventions, primary school, body satisfaction, media pressure, body image, prevention

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designed by teachers to improve children's body satisfaction

Prospective studies demonstrate that body dissatisfaction during late childhood and

adolescence is associated with increased negative affect (Ferreiro, Seoane, & Senra, 2012;

Stice & Bearman, 2001), reduced levels of physical activity (Neumark-Sztainer, Paxton,

Hannan, Haines, & Story, 2006), and is a risk factor for the development of eating disorders

(Ferreiro et al., 2012; Stice, Marti, & Durant, 2011). There is also evidence that body

dissatisfaction develops during childhood with 40-50% of 6-12 year olds reporting that they

are unhappy with the way they look (Smolak, 2011). Consequently, body image interventions

have been designed to engage preadolescents in the hope of preventing or reducing body

image concerns before they become entrenched (Paxton, 2002; Ross, Paxton, & Rodgers,

2013; Smolak & Levine, 2001). The current study evaluates a 6 lesson portion of *Body Image*

in the Primary School (Hutchinson & Calland, 2011). This 49 lesson curricular program,

published in the UK, is designed for children ages 5 through 11 and has been recognized with

a Body Confidence Award from the UK All Party Parliamentary Group on Body Image in

2012. However, it has not been empirically tested.

Schools are an ideal setting for health promotion interventions due to the potential to

embed developmentally appropriate activities into the existing curriculum, providing access

to all young people (Yager, Diedrichs, Ricciardelli, & Halliwell, 2013). Body image is a

multidimensional construct that incorporates cognitive, affective and behavioral components

(Smolak & Cash, 2011). Assessing the breadth of the body image construct in children is

problematic and is hampered by a lack of understanding of developmental trajectories in the

emergence of different body image components and a limited number of validated measures

for this age group (Smolak, 2011). However, measures of evaluative and affective

components of children's body image have been validated (Hill, 2011; Smolak, 2011) and a number of programs have been successful in improving these components of body image among preadolescents (i.e., < 12 years). Indeed, a handful of interventions have found improvements in body image at post-intervention (Dohnt & Tiggemann, 2008; Halliwell, Easun, & Harcourt, 2011; McVey, Davis, Tweed, & Shaw 2004; Ross, Paxton, & Rodgers 2013; Wick et al., 2011), and at longer follow-up periods including 6 weeks (Duncan, Al-Nakeeb, & Nevill, 2009), 3 months (Bird, Halliwell, Diedrichs, & Harcourt, 2013; Yeh, Liou, & Chien, 2012), and 24 months (Smolak & Levine, 2001) in comparison to control groups (e.g., class as usual). In some studies where effects have been analyzed separately for boys and girls, intervention effects have been stronger and more sustained among girls (Bird et al., 2013; Smolak & Levine, 2001).

Based on sociocultural models of body image (Tiggemann, 2011), these effective programs have largely focused on reducing risk factors for the development of body dissatisfaction such as sociocultural pressures (e.g., the impact of peers and media influences), body comparisons, and internalization of appearance ideals. Effective programs have utilized approaches such as movement and physical activity (Duncan et al, 2009), or the reading of a storybook (specifically Shapesville) (Dohnt & Tiggemann, 2008).

A substantial number of programs, however, have not reported significant improvements in body image despite using innovative approaches such as working with a local theatre company to develop and perform a theatre production (Haines, Neumark-Sztainer, Perry, Hannan, & Levine, 2006). Furthermore, some of these programs have utilized a whole school approach, which goes beyond the provision of a content based curriculum to address the sociocultural environment in which these problems develop (McVey, Tweed & Blackmore, 2007; Stock et al., 2007). Again, these impressive, resource intensive efforts have not demonstrated improvements in body image among the intervention

group, as compared to the control group. Clearly, there is considerable variability in the impact of different intervention programs despite targeting known risk factors. Therefore, it is important that novel body image interventions are evaluated before endorsement and widespread dissemination.

The current study aims to evaluate the impact of part of a body image curriculum that was developed by teachers for the primary school classroom in the UK, based on their review of the body image literature and their own extensive experience of working with primary school children. The program has been published as a book, *Body Image in the Primary School* (Hutchinson & Calland, 2011).

Given that the program is readily available and has not been evaluated, the aim of this study was to establish whether the lessons have an impact on children's body image. In line with existing effective programs (e.g., Bird et al., 2013), the *Body Image in the Primary School* intervention is designed to target a number of risk factors for the development of body dissatisfaction, including media influences and peer pressure. The program consists of class discussions, game playing, worksheets, and role plays. Given that the content and delivery of this program is comparable to existing effective interventions, it was predicted that girls and boys who were randomly allocated to take part in the six session Body Image in Primary School intervention would report improved body image and intervention topic knowledge in comparison to the class as usual control group. Moreover, it was hypothesized that children in the *Body Image in the Primary School* intervention would report reduced media influence compared with the control group. Specifically, it was predicted that girls and boys in the intervention group would report reduced internalization of appearance ideals, awareness of appearance ideals, and perceived pressure from the media to match appearance ideals in comparison to the control group.

Method

Participants

Participants were 74 girls and 70 boys aged 9 and 10 years (girls M_{age}=9.46, SD_{age} = 0.50; girls M_{BMI}= 17.87, SD_{BMI} = 3.89; boys M_{age}=9.49, SD_{age} = 0.53; boys M_{BMI}= 17.68, SD_{BMI} = 4.14), recruited from four primary schools in the south-west of England. The majority of participants were White (92%). The schools were comparable on percentage of pupils with special educational needs, entitled to free school meals, and speaking English as an additional language. Two schools were smaller than the average UK primary school (< 200 students, one control, one intervention), one was average size (control), and one was above average size (intervention). Year 5 classes from two schools were randomly assigned to the intervention condition (girls n= 39, boys n= 40) and year 5 classes in the other two schools were assigned to the control condition (girls n = 35, boys n = 30).

Materials

Intervention. The intervention materials were taken from *Body Image in the Primary School* (Hutchinson & Calland, 2011), which presents a body image curriculum for primary schools. The curriculum is separated into a set of 16 key stage one (UK curriculum content for children aged 4-7) and 33 key stage two (UK curriculum content for children aged 7-11) step by step lesson plans. The majority of past intervention evaluation studies with preadolescents has included children aged 7-12 (e.g., Bird et al., 2013; Duncan et al., 2009; McVey et al., 2004; Ross et al., 2013; Smolak & Levine, 2001). Therefore, the current evaluation focused on the key stage two lessons for 7-11 year olds. The key stage two lesson plans address four core themes: valuing diversity in appearance, celebrating one's own unique appearance, managing appearance related teasing, and developing resilience to media and peer pressures about appearance. Based on discussions between the first author and the authors of *Body Image in the Primary School* six lessons were selected for this evaluation.

Lessons from each theme that most strongly targeted body dissatisfaction and media pressures were selected. This created a set of six, one hour lessons, which were representative of the whole *Body Image in the Primary School* curriculum. The focus of each lesson and the learning outcomes are listed in Table 1. The intervention content was delivered through brainstorming exercises, class discussion, small group work, work in pairs, game playing, role play, and viewing film clips. Each session began with an introduction and recap, and ended with a summary of the learning during that session. In the final session there was also a summary of the key learnings across the six weeks.

Measures

The measures used in this study were selected based on their suitability for children aged 9 and 10 years.

Body image concerns. Body image concerns were assessed by the Revised Body Esteem Scale (BES) developed by Mendelson and White (1993). The BES was designed to assess children's attitudes and feelings towards their body and appearance overall (Mendelson & White, 1993). It consists of 20 items, such as "I'm proud of my body" and "I wish I was thinner", assessing children's overall satisfaction with their appearance, and with their weight. The response format for this scale was modified so that children reported their agreement with each statement on a 5 point Likert scale that ranges from 1 (*disagree a lot*) to 5 (*agree a lot*). The BES has been found to possess good internal consistency and reliability (Mendelson, White, & Mendelson, 1996), good construct validity (Smolak, 2004), and moderate test-retest reliability (Mendelson et al., 1996) for both boys and girls. We calculated a mean score across the body esteem items. In the current study the Cronbach's alphas for the scale calculated for boys and girls separately at baseline, post-intervention, and follow-up were > .82.

Media influence. Media influence was assessed with the Multidimensional Media Influence Scale (MMIS: Cusumano & Thompson, 2001), which has three subscales. The three item awareness subscale measures individuals' awareness of sociocultural appearance ideals. For example, one item is 'people who are in good shape are better looking than people who are not in good shape'. The six item internalization subscale measures the extent to which these appearance ideals have been adopted as personal standards, for example 'I try to look like the models in magazines'. The two item pressure subscale measures an individuals' perceived pressure from the media to match the appearance of its models and actors, for example 'Watching movies makes me want to diet'. Participants reported their agreement with each item on a 5 point Likert scale that ranges from 1 (*disagree a lot*) to 5 (*agree a lot*). There is some evidence for the validity of the MMIS among boys and girls aged 7-12 (Cusumano & Thompson, 2001: Harrison, 2009). In the current sample all Cronbach's alphas, calculated separately for boys and girls, were >.78.

Intervention topic knowledge. Participants were asked to indicate their agreement with four statements to measure intervention topic knowledge. The statements were generated through discussion between the researchers and intervention authors to reflect the key learning objectives in the body image lessons. They include: 'People's ideas about what is beautiful have changed over time', 'Most images of people in magazines have been changed using computer techniques, for example photoshopping or airbrushing', 'It is important to be able to say good things about my appearance', and 'I know how to help someone who might be teased about their looks'. Again, participants rated their agreement with each statement on a 5 point Likert scale that ranges from 1 (*disagree a lot*) to 5 (*agree a lot*).

Feedback on the lessons. Intervention participants were asked to provide feedback about the lessons. They rated seven statements using a 5 point rating scale that ranges from 1 (*disagree a lot*) to 5 (*agree a lot*). The statements were; 'I enjoyed the lessons', 'I understood

the lessons', 'I think I learnt some new things from the lessons', 'I felt comfortable taking part in the lessons', 'I would like to have more lessons like this in school', 'The lessons have made me feel better about myself', and 'I think most children my age would understand the lessons'.

Procedure

The study was approved by the university ethics committee. Six schools in the same city were initially invited to take part in the study and four agreed to participate. Passive parental consent was obtained for 98% of participants across these four schools. At the beginning of the study researchers visited each school and introduced the study to the children. All children who had been given parental consent to participate assented to complete the questionnaires and/or to be weighed and measured. Children completed the baseline questionnaires in the classrooms while a member of the research team read the questionnaire items out aloud to the children and another researcher responded to questions and issues. Each item in the questionnaire scale was presented with faces to facilitate the children's understanding of the response format. A practice item "I like swimming" was presented at the beginning of the questionnaire and this item was discussed to make sure that all children understood the response options.

At the end of the first data collection session, the female researchers took measurements of height and weight for each child. Each child was weighed and measured individually in a separate area, and the scale display was covered so that children could not see the measurement readings. BMI was calculated as weight (kg)/height (m)^2.

For the intervention schools, the body image lessons began the following week and ran for six consecutive weeks. These lessons replaced a session of regular teaching each week. The two female teachers who authored the original *Body Image in the Primary School* book delivered the body image lessons. They each have over 25 years of teaching experience

and expertise in the area of body image. The children completed a post-intervention questionnaire immediately after the final lesson and another follow-up questionnaire 3 months later. Children in the control group completed questionnaires at the same time intervals and received their regular lessons. In each case a researcher read the questionnaire items aloud to the class. At the end of the study the control schools were given a copy of the body image lesson plans, and teachers from these schools were invited to attend a training session about delivering the lessons.

Results

Analysis Plan

Data screening did not show any unusual or unduly influential observations for any variables. The primary analysis was an analysis of covariance (ANCOVA) with the baseline measure as the covariate, experimental group as the independent variable, and with a covariate by group interaction term. Separate analysis was conducted for post and follow-up data. The interaction term is of interest as it explores whether those with the greatest propensity to change (i.e., at the low end of the scale) show the greatest improvement in the intervention group. A residual analysis showed that underpinning ANCOVA model assumptions were not grossly violated. Effect size is reported as partial eta squared, η^2. For univariate tests, tentative benchmarks help effect size interpretation and in terms of thresholds, $\eta^2 < .01$ indicates a trivial inconsequential effect, $.01 < \eta^2 < .09$ indicates a small effect, $.09 < \eta^2 < .25$ indicates a medium sized effect, $.25 < \eta^2 < .50$ a large effect, and $\eta^2 > .50$ indicates a very large effect (see Cohen, 1988). These guidelines do not necessarily easily translate to omnibus multivariate effects.

For boys, 21.1% of cases had some missing data, with 7.1% missing over all outcome data. For girls, 18.9% of cases had some missing data, with 7.7% missing over all outcome

data. In general, Bennet (2001) indicates analyses are prone to bias if more than 10% of the

data is missing. Initially, we ran the analysis using pairwise deletion (i.e., maximizing the

amount of available at each analysis). In order to check whether our results were biased by

missing data, p-values estimated under multiple imputation with 50 imputations (MI50) were

run where significant effects were identified. Imputation was performed using all outcome

data and demographic data, including BMI and age. However, as the MI50 analysis yielded

results that were substantially the same and the ANCOVAS, only the ANCOVA analyses are

reported here.

At the multivariate level, a MANOVA indicated that there was no significant omnibus

gender difference across body esteem, internalization, awareness, or pressure at baseline,

Lambda = .96, $F(4, 139) = 1.48$, $p = .22$, partial $\eta^2 = .04$. However, the univariate ANOVA

indicated that the gender difference for body esteem approached significance with girls

reporting lower body esteem than boys, $F(1, 142) = 3.66$, $p = .05$, partial $\eta^2 = .03$.

A power analysis was conducted to identify the minimum sample to detect a medium

sized interaction effect in the ANCOVA analysis using contemporary levels of significance

(alpha = .05), and power (beta = .2). This analysis indicated a minimum sample size of $n =$

36 per condition would be needed to detect a medium sized intervention effect assuming the

covariate baseline measure is related to outcome with an assumed partial eta-squared of 0.2

or higher. The required sample size indicated in this analysis is consistent with those used in

similar research (e.g., Bird et al., 2013; Ross et al., 2013). On this basis separate analyses for

boys and girls were performed.

At baseline a MANOVA revealed that there were no statistically significant

differences between the control group and intervention group on BMI, body esteem,

internalization, awareness, or pressure for girls, Lambda = .90, $F(5, 60) = 1.30$, $p = .27$,

partial $\eta^2 = .10$, or boys, Lambda $= .86$, $F(5, 62) = 2.02$, $p = .09$, partial $\eta^2 = .14$. Means and standard deviations for study variables at all time points are reported in Table 2.

Girls' Body Esteem

To examine the impact of the body image lessons we conducted a series of ANCOVAs, controlling for baseline levels, examining condition, and condition by baseline level interaction effects.

For post intervention levels of body esteem, there was a significant effect of baseline levels on body esteem, $F(1,58) = 54.32$, $p < .001$, partial $\eta^2 = .48$, a significant effect of condition, $F(1, 58) = 9.22$, $p < .01$, partial $\eta^2 = .14$, and a significant interaction effect between condition and baseline levels of body esteem, $F(1, 58) = 7.57$, $p < .01$, partial $\eta^2 = .12$, (see Figure 1). This indicates that, immediately post-intervention, there were significant differences between body esteem reported by girls in the control and intervention condition. Moreover, that the differences between conditions depended on baseline levels of body esteem.

The covariate adjusted means were significantly higher in the intervention condition, $M = 3.87$, $SE = 0.09$, than in the control condition, $M = 3.65$, $SE = 0.11$, indicating that girls who received the intervention had significantly higher body esteem than controls at post-intervention. Examination of the interaction graphs shown in Figure 1 indicate that, in the experimental condition, girls with lower levels of body esteem at baseline showed greater improvements in body esteem than girls with higher baseline body esteem. In contrast the gradient of the slope of the regression line for the control group was .89 indicating little change in scores from baseline to immediately post-intervention.

For body esteem at follow-up, there was significant effect of baseline body esteem, $F(1,65) = 52.60$, $p < .001$, partial $\eta^2 = .45$, a significant effect of condition, $F(1, 65) = 5.65$, p

= .02, partial η^2 = .08, and a significant interaction between baseline body esteem and condition, $F(1, 65) = 4.64$, $p = .04$, partial $\eta^2 = .06$ (see Figure 2).

Again the covariate adjusted means indicate that body esteem is higher in the intervention condition, $M = 3.85$, $SE = 0.11$, than in the control condition, $M = 3.66$, $SE = 0.12$. Figure 2 reveals a similar pattern in the follow-up data to the post-data. Girls in the intervention group with lower levels of body esteem at baseline showed larger improvements than girls with higher baseline body esteem. Again the gradient for the control group show little change from baseline to follow-up.

These findings support our hypothesis that girls in the intervention condition would report higher body esteem than girls in the control condition immediately post-intervention and at follow-up.

Girls' Internalization of Media Ideals

The ANCOVA model for post-intervention internalization showed a significant effect of baseline internalization, $F(1, 58) = 64.55$, $p < .001$, partial $\eta^2 = .53$. However, there was no significant effect of condition, $F(1, 58) = 0.27$, $p = .61$, partial $\eta^2 = .01$, and no significant interaction, $F(1, 58) = 2.58$, $p = .11$, partial $\eta^2 = .04$. Similarly, for follow-up internalization there was a significant effect of baseline internalization, $F(1, 65) = 25.79$, $p < .001$, partial $\eta^2 = .28$, no significant effect of condition, $F(1, 65) = .06$, $p = .81$, partial $\eta^2 < .01$, and no significant interaction, $F(1, 65) = 2.26$, $p = .14$, partial $\eta^2 < .03$. These results indicate that there were no significant differences in levels of internalization reported by girls in the intervention and girls in the control group at post-intervention or follow-up.

Girls' Awareness of Media Ideals

There was a significant main effect of baseline levels on post-intervention awareness, $F(1, 58) = 21.69$, $p < .001$, partial $\eta^2 = .27$. However, neither the effect of condition, $F(1, 58) = 1.38$, $p = .25$, partial $\eta^2 = .02$, nor the interaction effect, $F(1, 58) = 1.97$, $p = .17$, partial η^2

= .03, were significant. For follow-up awareness, baseline levels continued to have a significant effect, $F(1, 65) = 12.23$, $p < .001$, partial $\eta^2 = .16$. Again, the condition effect, $F(1, 65) = 0.55$, $p = .46$, partial $\eta^2 = .01$, and the interaction effect, $F(1, 65) = 0.63$, $p = .43$, partial $\eta^2 = .01$, were not significant.

Girls' Perceived Media Pressure

At post-intervention, there was a significant effect of baseline levels on perceived media pressure among girls, $F(1, 58) = 30.84$, $p < .001$, partial $\eta^2 = .35$. The condition effect, $F(1, 58) = 0.98$, $p = .33$, partial $\eta^2 = .02$, and the interaction effect, $F(1, 58) = 0.55$, $p = .46$, partial $\eta^2 = .01$, were not significant. The same pattern emerged at follow-up with a significant effect of baseline pressure, $F(1, 64) = 5.00$, $p = .029$, partial $\eta^2 = .07$ but no significant effects of condition, $F(1, 64) = 2.07$, $p = .16$, partial $\eta^2 = .03$, and no significant interaction effect, $F(1, 64) = 3.58$, $p = .06$, partial $\eta^2 = .05$.

The findings do not support our hypotheses relating to media influence, there were no significant differences between girls in the control and intervention condition on measures of media influence at post-intervention or follow-up.

Boys' Body Esteem

For post intervention levels of body esteem, there was a significant effect of baseline levels of body esteem, $F(1,62) = 10.83$, $p < .001$, partial $\eta^2 = .15$. However, there was no significant effect of condition, $F(1, 62) = 0.03$, $p = .86$, partial $\eta^2 < .01$, and no significant interaction effect, $F(1, 62) = 0.002$, $p = .97$, partial $\eta^2 < .01$. Again at follow-up, there was a significant effect of baseline body esteem $F(1,57) = 22.49$, $p < .001$, partial $\eta^2 = .28$. There was no significant effect of condition, $F(1, 57) = 1.44$, $p = .24$, partial $\eta^2 = .03$, and no significant interaction effect, $F(1, 57) = 1.76$, $p = .19$, partial $\eta^2 = .03$. The hypothesis that boys would report greater body esteem in the intervention condition, compared to control, was not supported.

Boys' Internalization of Media Ideals

For post-intervention levels of internalization, there was a significant effect of baseline internalization, $F(1, 62) = 61.40$, $p < .001$, partial $\eta^2 = .50$, no significant effect of condition, $F(1, 62) = 0.96$, $p = .33$, partial $\eta^2 = .02$, and no significant interaction, $F(1, 62) = 0.22$, $p = .64$, partial $\eta^2 < .01$. At follow-up the ANCOVA model showed a significant effect of baseline internalization, $F(1, 57) = 17.00$, $p < .001$, partial $\eta^2 = .23$. There was also a significant effect of condition, $F(1, 57) = 9.26$, $p = .004$, partial $\eta^2 = .14$ and a significant interaction between condition and baseline levels of internalization, $F(1, 57) = 18.72$, $p < .001$, partial $\eta^2 = .25$ (see Figure 3). Contrary to hypotheses, the covariate adjusted means indicate that internalization is higher in the intervention condition, $M = 1.59$, $SE = 0.09$, than in the control condition, $M = 1.29$, $SE = 0.12$. Figure 3 shows relatively little change in internalization from baseline to follow-up in the intervention group. In the control group there is a greater reduction in internalization among boys who were higher on internalization at baseline.

Boys' Awareness of Media Ideals

The ANCOVA model of post-intervention levels of awareness of media ideals revealed a significant main effect of baseline levels, $F(1, 62) = 43.82$, $p < .001$, partial $\eta^2 = .41$. There was no significant effect of condition, $F(1, 62) = 0.04$, $p = .84$, partial $\eta^2 = .01$ and no significant interaction effect, $F(1, 62) = 0.27$, $p = .61$, partial $\eta^2 = .01$. Similarly, at follow-up the effect of baseline levels was significant, $F(1, 56) = 23.45$, $p < .001$, partial $\eta^2 = .30$, but the condition effect, $F(1, 56) = 0.30$, $p = .59$, partial $\eta^2 = .01$, and the interaction effect, $F(1, 56) = .85$, $p = .36$, partial $\eta^2 = .02$, were not significant.

Boys' Perceived Media Pressure

There was a significant effect of baseline levels on post-intervention perceived media pressure, $F(1, 62) = 25.50$, $p < .001$, partial $\eta^2 = .29$. The condition effect, $F(1, 62) = 0.37$, p

$= .56$, partial $\eta^2 = .01$, and the interaction effect, $F(1, 62) = 1.72$, $p = .19$, partial $\eta^2 = .03$, were not significant. At follow-up the pattern of results was the same. Baseline levels had a significant effect, $F(1, 57) = 21.17$, $p < .001$, partial $\eta^2 = .27$, but condition, $F(1, 57) = 0.24$, $p = .63$, partial $\eta^2 = .01$, and the interaction between condition and baseline levels, $F(1, 57) = 1.71$, $p = .20$, partial $\eta^2 = .03$, did not.

These results did not support our hypothesis that media influence would be lower in the intervention group than the control group.

Intervention Topic Knowledge

ANCOVAs, controlling for baseline levels, were conducted on each of the intervention topic knowledge items separately for girls and boys. The means and standard deviations for these items are reported in Table 3. For ease of presentation only main effects of condition effects are reported here. There was no significant effect on condition on knowledge that ideals of beauty had changed over time for girls, $F(1, 58) = 1.05$, $p = .31$, partial $\eta^2 = .02$, or boys, $F(1, 63) = .04$, $p = .84$, partial $\eta^2 = .01$ at post-intervention. At follow-up there was no significant effect of condition for boys, $F(1, 57) = 0.37$, $p = .55$, partial $\eta^2 = .01$. However, girls reported significantly higher levels of agreement with this statement at follow-up, $F(1, 64) = 5.38$, $p = .024$, partial $\eta^2 = .08$.

Awareness of digital manipulation of images was significantly higher in the intervention condition than the control condition post-intervention for girls, $F(1, 58) = 15.82$, $p < .001$, partial $\eta^2 = .21$, and for boys, $F(1, 61) = 12.41$, $p < .001$, partial $\eta^2 = .17$. Moreover, this effect of condition was maintained at follow-up for girls, $F(1, 65) = 13.31$, $p < .001$, partial $\eta^2 = .17$, and for boys, $F(1, 56) = 5.61$, $p = .023$, partial $\eta^2 = .09$.

For boys there was no main effect of condition on the importance of saying positive things about one's appearance post-intervention, $F(1, 63) = 1.14$, $p = .29$, partial $\eta^2 = .02$, or at follow-up, $F(1, 57) = 0.89$, $p = .35$, partial $\eta^2 = .02$. In contrast, the condition effect for

girls was marginally significant at post-intervention, $F(1, 58) = 3.89$, $p = .05$, partial $\eta^2 = .06$, and significant at follow-up, $F(1, 65) = 6.43$, $p = .014$, partial $\eta^2 = .09$.

There was no effect of condition on girl's knowledge about how to help someone being teased about their looks post-intervention, $F(1, 58) = 0.68$, $p = .41$, partial $\eta^2 = .01$, or at follow-up, $F(1, 66) = 0.77$, $p = .38$, partial $\eta^2 = .01$. However, boys reported greater knowledge about how to help someone being teased both at post-intervention, $F(1, 62) = 16.73$, $p < .001$, partial $\eta^2 = .21$, and at follow-up, $F(1, 57) = 9.27$, $p < .001$, partial $\eta^2 = .14$.

Feedback on the Body Image Lessons

The responses of intervention participants to the feedback questions are reported in Table 4. The vast majority of both girls and boys who took part in the lesson rated them as enjoyable, understood the content of the lessons, felt that they learnt some new things from the lessons, felt comfortable during the lessons, would have liked more of these lessons, and felt other children of their age would understand the lessons.

Discussion

The current study aimed to evaluate the impact of a set of body image lessons designed by teachers, and widely available to schools for pre-adolescent boys and girls. The content of the lessons focused on appreciating diversity in appearance, celebrating one's own body, understanding media influences on body image, and managing peer pressure around appearance. It was predicted that the program would increase body esteem, decrease awareness and internalization of sociocultural appearance ideals, and decrease perceived media pressure. The body image lessons were associated with increased body esteem for girls compared with the control group, both at post-intervention and at 3-month follow-up. Moreover, girls with lowest levels of body esteem at baseline showed the largest improvements post-intervention and at follow-up. This is consistent with evidence that universal eating disorder prevention programs are more effective for sub-groups of

participants with higher baseline levels of concern than for the full sample (Stice, Shaw, & Marti, 2007). However, this needs replication with preadolescent girls before strong conclusions can be drawn.

The results for body esteem are promising and suggest that the lessons are beneficial for girls. The findings also indicate the acceptability and the feasibility of the intervention based on the positive feedback on the lessons given by participants. However, the findings need to be evaluated in light of the lack of significant positive intervention effects on measures of boys' body esteem and media influence for girls and boys.

The results suggest that the intervention is more effective for girls than boys. This is consistent with previous primary school based research which finds relatively fewer intervention effects for boys (e.g., Bird et al., 2013). At baseline, girls reported lower body esteem than boys. Given that baseline body esteem moderated the intervention effects, it may be that boys were relatively less able to benefit from the lessons. Interestingly, the impact on girls' body esteem was independent of any impact on the media variables. The intervention content was selected to target internalization as this is a known risk factor for the development of body dissatisfaction (Stice & Whitenton, 2002). However, the current findings suggest that changes in body esteem were not driven by changes in internalization. This suggests that aspects of the lessons, other than a focus on critiquing appearance ideals, may have been responsible for the improvement in girls' body esteem. We did not assess the impact of peer relationships in this study. It may be that peer influences are more relevant than media influences at this age. Alternatively, the intervention increased awareness of the benefits of talking positively about one's appearance among girls but not boys. It may be that an increased attention to positive aspects of appearance explains some improvement in girls' body esteem. This warrants further investigation.

Boys, but not girls, reported increased knowledge about ways to help someone who is being teased about their appearance. Single item measures of topic knowledge were used, therefore these data should be interpreted with caution. However, our findings suggests that girls and boys took different messages from the lessons and it may be that girls were more strongly influenced to value positive aspects of their own appearance. Revisions to the intervention content to target specific aspects of boys' body image concerns may strengthen intervention effects.

There were no positive intervention effects on media influence variables among girls or boys. In fact, at follow-up data collection, boys in the control group reported significantly lower levels of internalization than in the intervention group. Analysis of the means indicates that levels of internalization decreased from baseline to follow-up for boys in the control. The means table also reveals a trend for improvements in media variables and body esteem for girls and boys across the 3 months of the study in the control and intervention group. These changes are important because they minimize differences between the control and intervention group post intervention and have implications for study methodology, interpretation and our understanding of body image development.

We are not the only researchers to see changes in the control group of an intervention study. In their study of older Swiss adolescents, Buddeberg-Fischer and colleagues also reported improvements among the control and intervention participants (Buddeberg-Fischer, Klaghofer, Gnam, & Guddeberg, 1998). In this case, some but not all control groups may have been in the same schools as the intervention participants. They attributed this to potential 'Hawthorne' or 'Rosenthal' effects, whereby participants' increased awareness of, and attention to, the issues about which they are being questioned, or their attempts to meet what they perceive the investigators' expectations to be might alter their responses (Buddeberg-Fischer et al., 1998). However, two studies that, like this study, allocated into

intervention and control conditions by school have also reported improvements in the control participants. McVey & Davis, (2002) also found improvements in body satisfaction and eating behaviors among a group of 11-year-old girls over a 6 week period that was maintained at 1 year follow-up. Recently, Diedrichs, Atkinson, Steer, Garbett, Rumsey, and Halliwell (2015) found improvements on internalization of sociocultural ideals and appearance related teasing among 11-13 year old girls allocated to the control group. Changes among the control group on some study variables undermine attempts to attribute changes to intervention programs and raise important issues that need to be considered.

There are a number of potential reasons for changes in control groups. First, it is always possible that the students in the control group are exposed to other programs or materials in their school or home life that have an impact on their body image. In order to try to prevent this from happening we spoke to control schools, and asked them not to cover any body image content for the duration of the study. At the end of the study teachers in the control schools confirmed that they had not delivered content focusing on body image. However, it is possible that schools unknowingly implemented class materials that had an impact on body image, or risk factors for body dissatisfaction.

The questionnaire may also have prompted control group students to discuss body image or self-esteem with their peers, parents and friends, which might also have impacted on their results. To explore this possibility we asked participants in the control condition to report their body image interactions with parents and teachers in their follow-up questionnaire. The majority of participants in the control condition (85%) reported that they had not talked to their teachers about body image during the 3 month study period. Similarly, most (78%) reported that they had not talked to their parents about body image during this period. The responses about whether they had had any lessons on body image during this

period were more mixed, 33% reported that they had not, 26% reported that they had, and 41% were not sure whether they had received lessons on body image during this period.

Alternatively, there may be something inherent in the methodology of this study that led to changes across time. During the first questionnaire session all of the children were weighed and measured. As this is potentially sensitive, we took care over how this was conducted. Measurements were taken after questionnaire completion, each child was weighed and measured in private and the readings were not made visible to the participants. However, the children were aware that this was going to happen because the information was included in the letters to parents and in our explanation of the study. Children may have interpreted the weighing and measuring as an indication that their body size and shape was important to us. This may have increased appearance concerns and their endorsement of societal appearance standards among all children. Indeed, experimental research has found that children's state self-esteem is quite easily modified immediately following peer feedback (Thomaes et al., 2010). This methodological factor could potentially reduce levels of body esteem and increase levels of media influence as baseline, relative to the other data collections.

Another potential explanation for changes in control groups is developmental. Longitudinal body image risk factor research has revealed that boys and girls experience a decrease in their perceived sociocultural influences over a 16-month period from a mean age of 9 to a mean age of 10 years. Children also experienced a plateau in body image and body change strategies (McCabe & Ricciardelli, 2005). McCabe and Ricciardelli (2005) explained these changes as being due to developmental changes in the peer comparison process. Children in the early years of primary school begin to engage in social comparisons and experience a subsequent decrease in their self-evaluations and self-worth but as they near the later primary school years, young people start to make more positive self-evaluations (Marsh, Craven, & Debus, 1998). Students in this study were in the penultimate year of their primary

school career and might have been feeling particularly confident academically and socially in terms of their place at the "top of the food chain' in their school. More research is needed in order to determine whether there are any developmental factors that might influence body image and sociocultural pressures during this developmental period.

There are a number of limitations that need to be considered. This preliminary study needs replication in a larger sample, particularly the impact of baseline levels of body esteem on intervention outcomes for girls. The participants were mainly White and from one city in the UK. Therefore, the relevance for the intervention for more diverse groups of preadolescents is unclear. Very experienced teachers delivered the intervention and they had expertise in body image. It is not clear whether these intervention effects would be replicated when delivered by teachers who are less experienced and less knowledgeable about this area. Finally, the current intervention focused on shifting body image attitudes through increasing knowledge and awareness. Recently, there has been increased emphasis on the benefits of embodied aspects of body image (Piran, 2015). Incorporating embodying behavioral elements into body image programs that enhance awareness of the body, connectedness with the body and feelings of competence may strengthen intervention effects.

The results of the present study provide preliminary evidence that this set of lessons from the Body Image in the Primary School intervention is beneficial for girls. It is clear that these lessons were associated with sustained improvements in girls' body esteem, particularly for girls with low levels of body esteem at baseline. Moreover, the lessons were rated very positively and participants reported that they would like more lessons on similar topics. However, the intervention did not impact on body image among boys and media influence over and above changes that were also experienced in the control group. Further research is important to extend our understanding of body image development but it is also critical to inform the timing and evaluation of interventions.

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Table 1

An outline of the aims of the body image lessons

Lesson Focus	Learning outcomes
Lesson 1: Appreciating appearance diversity	• Consider the concept of beauty • Learn that appearance doesn't provide enough information about a person • Understand the value of people's qualities and characteristics • Reflect on their own individuality
Lesson 2: How I feel about my looks	• Understand the concept of body image • Understand the importance of being positive about oneself
Lesson 3: Celebrating our healthy bodies	• Reflect on individual abilities in different active skills • Understand that everyone has different skills • Understand that abilities aren't fixed and develop through practice • Understand the importance of looking after one's body
Lesson 4: Influences on body image and advertising	• Understand the people are influenced by the media • Understand that images in manipulated
Lesson 5: Peer pressure	• Consider the influence of peer groups on body image • Consider how to develop positive peer relationships • Consider teasing and look at ways to overcome its impact
Lesson 6: Role models	• Understand the qualities of a good role model • Identify a role model based on qualities not appearance • Consider how to be a role model for others

Table 2

Mean Body Esteem, Internalization, Awareness, and Perceived Pressure by Condition, Time, and Gender

	Body Esteem	Internalization	Awareness	Perceived Pressure
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*
Girls				
Intervention				
Baseline	3.50 (0.81)	2.14 (0.94)	2.94 (0.86)	2.33 (1.16)
Post-intervention	3.89 (0.62)	1.88 (0.83)	2.38 (0.92)	1.94 (1.08)
Follow-up	3.85 (0.80)	1.44 (0.54)	2.16 (0.92)	1.74 (1.12)
No Intervention				
Baseline	3.41 (0.87)	2.03 (1.01)	2.86 (1.22)	1.80 (1.02)
Post-intervention	3.59 (0.96)	1.67 (0.74)	2.46 (1.17)	1.59 (0.92)
Follow-up	3.64 (0.96)	1.88 (1.03)	2.20 (1.17)	1.73 (1.06)
Boys				
Intervention				
Baseline	3.69 (0.97)	2.12 (0.84)	3.12 (1.23)	2.20 (1.18)
Post-intervention	3.90 (1.05)	2.11 (0.97)	2.60 (1.03)	2.01 (1.42)
Follow-up	4.00 (0.82)	1.63 (0.80)	2.51 (1.13)	1.68 (1.00)
No Intervention				
Baseline	3.78 (0.63)	1.99 (1.14)	3.05 (0.99)	1.87 (1.13)
Post-intervention	3.79 (0.79)	1.74 (0.88)	2.73 (0.99)	1.54 (0.79)
Follow-up	3.94 (0.60)	1.29 (0.59)	2.92 (1.11)	1.30 (0.54)

Table 3

Intervention topic knowledge by Condition, Time, and Gender

	Changing ideals M (SD)	Photoshopping M (SD)	Talking positively M (SD)	Helping others M (SD)
Girls				
Intervention				
Baseline	3.47 (0.79)	3.79 (0.93)	3.34 (1.21)	3.92 (1.13)
Posttest	3.83 (0.94)	4.81 (0.52)	4.36 (0.83)	3.97 (1.09)
Follow-up	3.95 (0.89)	4.61 (0.88)	4.51 (0.72)	4.00 (0.89)
No Intervention				
Baseline	3.67 (0.94)	3.80 (0.96)	3.74 (1.12)	3.71 (1.07)
Posttest	3.69 (1.23)	3.96 (1.24)	3.96 (1.04)	3.69 (1.19)
Follow-up	3.57 (0.94)	3.73 (1.17)	3.97 (1.03)	3.80 (0.93)
Boys				
Intervention				
Baseline	3.25 (1.05)	3.85 (0.84)	3.90 (1.08)	3.75 (1.40)
Posttest	3.63 (1.56)	4.60 (0.86)	4.03 (1.35)	4.29 (0.94)
Follow-up	3.92 (1.16)	4.53 (0.91)	4.11 (1.06)	3.92 (1.34)
No Intervention				
Baseline	3.67 (1.04)	3.60 (1.22)	3.71 (1.27)	3.64 (1.23)
Posttest	3.64 (1.22)	3.57 (1.45)	3.54 (1.20)	3.10 (1.43)
Follow-up	3.75 (1.07)	3.72 (1.21)	3.75 (1.19)	2.87 (1.31)

Table 4

Intervention participants' feedback on the lessons in percentages

	Girls (*n*=36)					Boys (*n*=38)				
	Strongly disagree	*Disagree*	*Not sure*	*Agree*	*Strongly agree*	*Strongly disagree*	*Disagree*	*Not sure*	*Agree*	*Strongly agree*
I enjoyed the lessons	0	2.8	2.8	11.1	83.3	5.3	5.3	0	7.9	81.6
I understood the lessons	0	2.8	2.8	16.7	77.8	0	2.6	0	18.4	78.9
I think I learnt some new things from the lessons	0	0	2.8	22.2	75.0	2.6	2.6	7.9	13.2	73.7
I felt comfortable taking part in the lessons	2.9	2.9	2.9	17.1	74.3	5.3	5.3	5.3	10.5	73.7
I would like to have more lessons like this in school	0	2.8	5.6	16.7	75.0	7.9	5.3	5.3	21.1	60.5
I think most children my age would understand the lessons	5.6	0	16.7	25.0	52.8	5.3	0	15.8	18.4	60.5

Figure 1: The relationship between girls' baseline and post-intervention levels of body esteem by condition
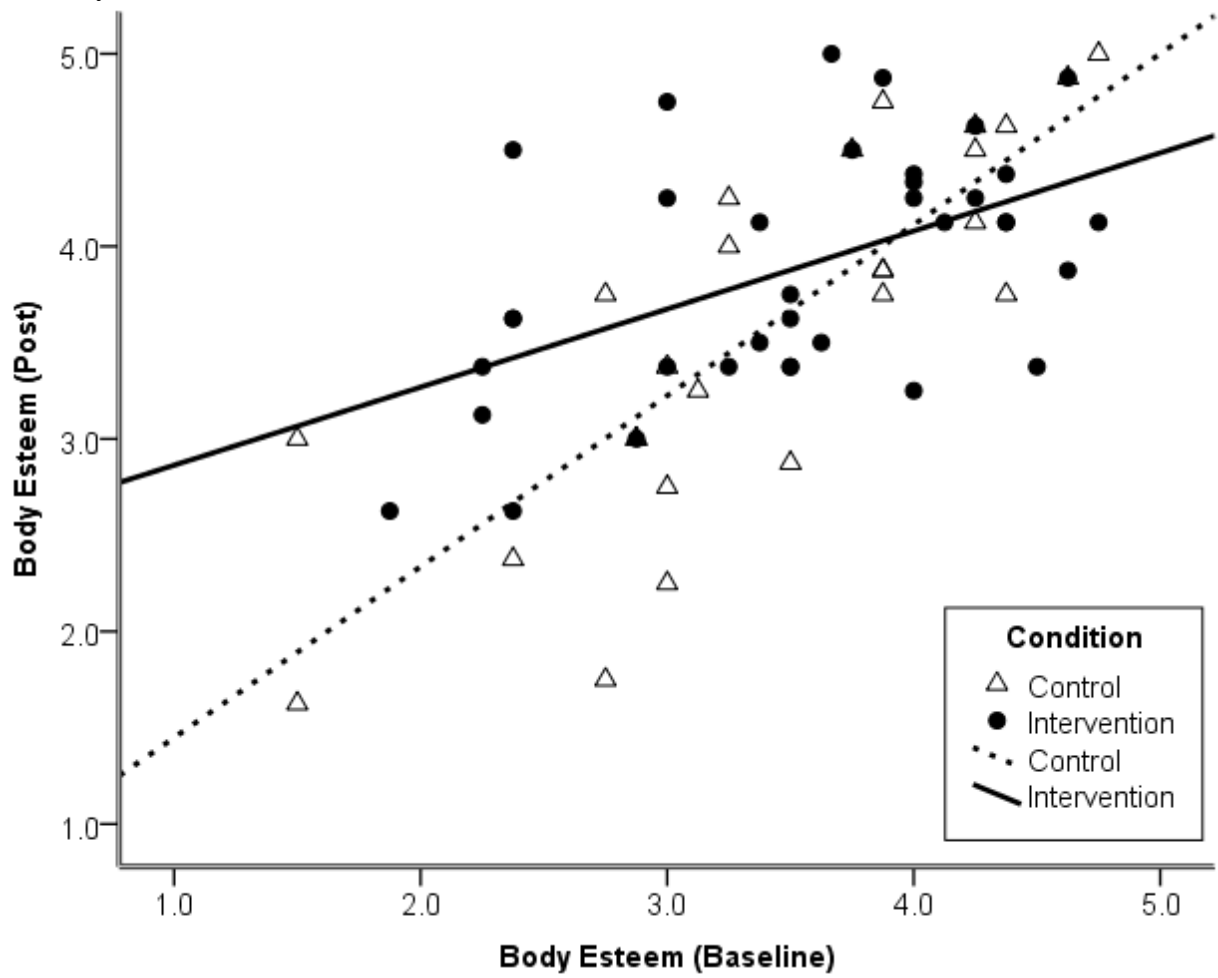
Figure 2: The relationship between girls' baseline and follow-up levels of body esteem by condition
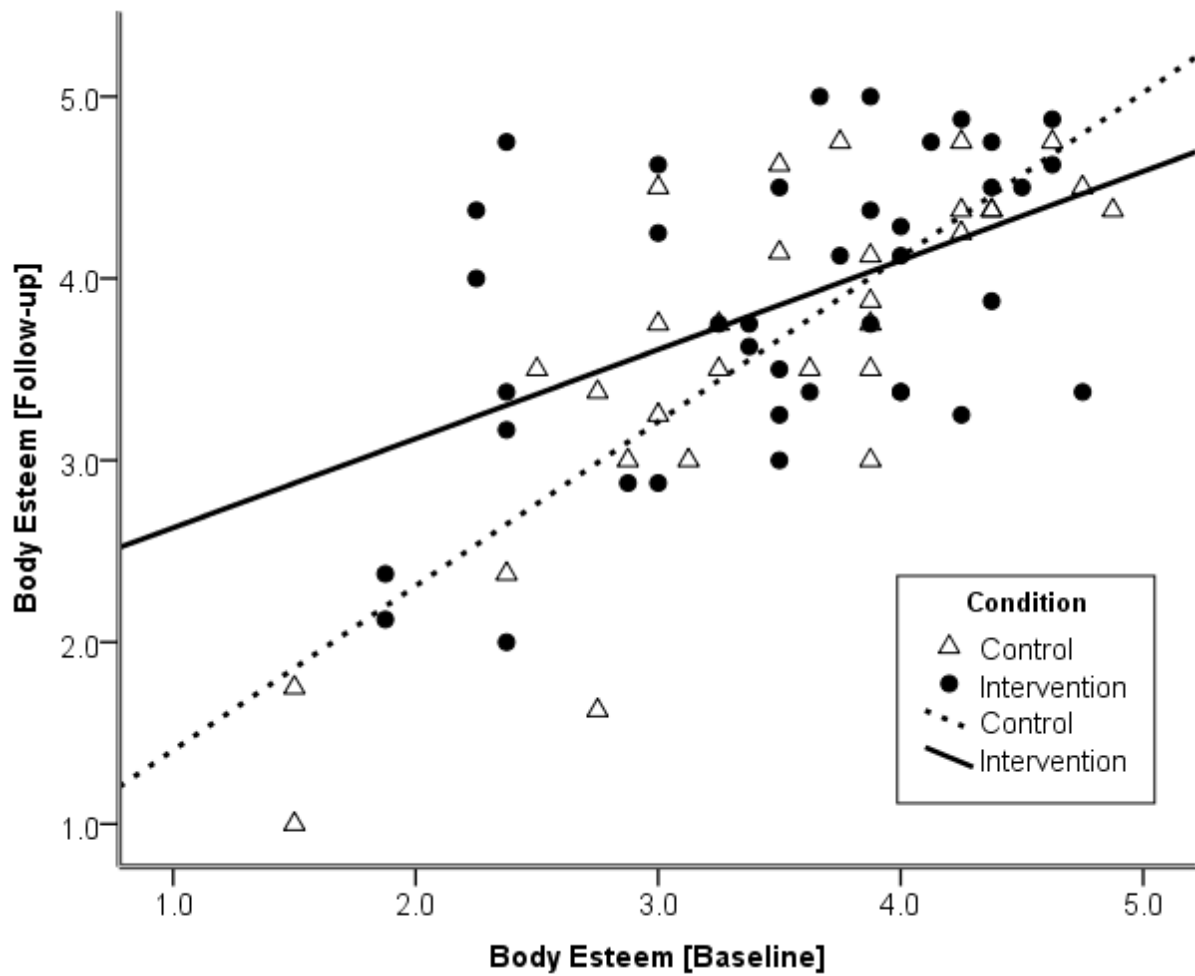
Figure 3: The relationship between boys' baseline and follow-up levels of internalization of media ideals by condition