

‘Everybody’s Different: The Appearance Game’. A randomised controlled trial evaluating an appearance-related board game intervention with children aged 9-11 years.

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This study evaluated the effectiveness of an educational board game aimed at increasing knowledge of appearance-related issues, positive body image, media literacy, and acceptance of appearance diversity with British school children. Two hundred and fifty-nine children, aged 9-11 (Mage = 10.26), from three primary schools in South-West England participated in a two-arm matched cluster randomised controlled trial. Outcome measures were collected pre-, post- and at two-week follow-up. Knowledge of appearance-related issues significantly increased in the intervention group, compared to the control group post-intervention, but was not maintained at follow-up. There were no significant differences between groups for body appreciation, media literacy or acceptance of visible difference. Of the intervention arm, 78% (n=117) they would like to play again and 85.3% (n=128) thought other children would like to play. Qualitative data suggests participants learned the key messages of the game. The findings suggest 'Everybody's Different: The Appearance Game' is an enjoyable way to increase knowledge of appearance-related issues. In future, researchers should consider how to increase body appreciation, media literacy and acceptance of appearance diversity, for example by increasing the dosage of the game or using it in conjunction with discussions and lessons surrounding appearance diversity and appearance-altering conditions.

Highlights

- An educational appearance game was evaluated with 259 children aged 9-11 years.
- Participants found the game enjoyable and would recommend it to other children.
- Knowledge of board game content significantly increased in the intervention group.
- No changes were found for body appreciation, media literacy or visible difference.
- Increasing game dosage or using it alongside other materials could be investigated.

1. Introduction

Body concerns are becoming increasingly prevalent in children and young people (Tatangelo & Ricciardelli, 2017). Evidence suggests that body image disturbance can occur before puberty (Schuck, Munsch, & Schneider, 2018), with some estimating that around half of children aged between 6 and 12 years old experience some dissatisfaction with their appearance (Smolak, 2011). Although research has historically focussed on body image in girls and women, for whom body image concerns are considered to be more prevalent (O’Dea, 2005), it is now recognised that body image is also a relevant issue for boys and men (De Jesus et al., 2015). Appearance dissatisfaction is associated with numerous negative health and psychosocial consequences, including depression, low self-esteem, disordered eating, decreased physical activity, risky health behaviours such as smoking and high-risk drinking, and poor academic engagement in adolescence (Bornioli, Lewis-Smith, Smith, Slater, & Bray, 2019; Halliwell, Diedrichs, & Orbach, 2014; Neumark-Sztainer, Paxton, Hannan, Haines, & Story, 2006; Paxton, Neumark-Sztainer, Hannan, & Eisenberg, 2006). Therefore, promoting a healthy body image in pre-adolescent children is an important priority for its potential to improve numerous aspects of quality of life (Bird, Halliwell, Diedrichs, & Harcourt, 2013).

In conjunction with this, social media now form a central part of the lives of many children and young people, with approximately 93% of children aged 8-11 years spending around 13.5 hours per week online (Ofcom, 2018). However, as with mainstream media, social media content can perpetuate body concerns by encouraging appearance-related social comparisons, which can occur in children as young as eight years old (Fardouly & Vartanian, 2016; Holt & Ricciardelli, 2002). For these reasons, appearance-related media literacy forms an important part of body image interventions, in order to encourage children to think critically about how appearance is portrayed in mainstream and social media (Potter, 2013).

School-based body image interventions can provide a practical way of targeting large numbers of children and have the potential to be integrated within the curriculum (Halliwell et al., 2016; Yager, Diedrichs, Ricciardelli, & Halliwell, 2013). In recognition of the importance of body

image, some governments are starting to acknowledge body dissatisfaction as a public health issue in children, which needs to be addressed at school (Yager et al., 2013). For example, the UK Government Equalities Office (2015) has initiated a Body Confidence Campaign that recommends body image issues should be incorporated into the UK National Curriculum.

Body image interventions tend to focus primarily on perceptions of one's own appearance, and the impact that this can have on physical and psychosocial wellbeing. However, one's own appearance-related attitudes and behaviours *towards others* can also have consequences. For example, in addition to the appearance-related pressures facing all young people, those who are born with, or acquire, conditions that alter their appearance away from what is considered to be 'the norm' can face additional concerns about their own appearance, and experience challenges relating to how society perceives them (Rumsey & Harcourt, 2004). Examples of these conditions, known collectively as 'visible differences', include cleft lip and/or palate or other craniofacial conditions, birthmarks, burn scars, and skin conditions such as eczema or psoriasis. Approximately one million people in the UK live with an appearance-altering condition (Partridge & Julian, 2008), with around 86,000 of these being children and young people (Changing Faces, 2018).

Unfortunately, there is considerable stigma surrounding appearance-altering conditions within society (Stock et al., 2013; Strauss et al., 2007). Those with visible differences can encounter staring, pointing and unwanted comments or questions in public places, which may make it difficult for them to partake in everyday activities (Rumsey & Harcourt, 2012). Similarly, children and young people with a visible difference may be subject to teasing or bullying, which can make it difficult to form peer relationships and negatively impact their academic engagement and achievement (Stock, et al., 2013; Strauss et al., 2007). Additionally, research shows that individuals with appearance-altering conditions are often negatively stereotyped. For example, they may be assumed to lack intelligence or capability to perform certain job roles, which can negatively impact their career prospects and aspirations (Richman, 1978; Stock et al., 2013). The way that people with appearance-altering conditions are portrayed in the media reinforces these negative attitudes (Stock et al., 2013;

Wardle, Boyce, & Barron, 2009). For example, individuals with visible differences are often portrayed as 'bad' or 'evil' characters in books, television, and film (Rumsey & Harcourt, 2012). Due to these experiences and societal prejudices, social anxiety and fear of negative evaluation from their peers and the public is common in people with appearance-altering conditions (Rumsey & Harcourt, 2012). To reduce this stigma, and increase acceptance of appearance diversity, the inclusion of content focussed on appearance-altering conditions could be included in media literacy programmes.

While some interventions have been developed to help young people with visible differences cope with the psychosocial aspects of looking 'different' (e.g., Williamson, Griffiths, & Harcourt, 2015), it is also important to focus on changing the prejudicial attitudes and behaviours of society (Thompson & Kent, 2001). This requires the development of effective population level interventions in order to increase knowledge, understanding, and acceptance of diversity of appearance. In addition to interventions for the adult population, targeting children and young people may be beneficial in order to influence societal attitudes as they are still developing.

At present, a number of school-based body image interventions have been developed and found effective at reducing negative body image, increasing media literacy, and preventing disordered eating (e.g., Becker & Stice, 2011; Bird et al., 2013; Diedrichs et al., 2015; Halliwell et al., 2016; Wilksch, O'shea, & Wade, 2018; Yager et al., 2013). The majority, however, are designed for secondary schools (11 years old and above). Additionally, these interventions typically do not include content about appearance diversity and appearance-altering conditions. Given that body image concerns develop at a young age, as children become more aware of appearance differences, it is important to develop interventions targeting these issues in ways that are interesting and engaging for younger children.

In addition, over the past decade, focus in the field has shifted towards the promotion of positive body image rather than on reducing the presence of negative body image (Halliwell, 2015). Positive body image relates to having a favourable and respectful attitude towards one's body, regardless of whether it meets societal appearance ideals (Halliwell, 2015). Menzel and Levine

(2011) characterise positive body image as having three central components, which are (a) appreciating the body and its functionality, (b) being attuned to the needs of the body, and (c) protecting oneself from negative messages relating to appearance. In particular, positive body image is seen as a valuable target of interventions because it is associated with increased psychological and physical wellbeing and may be protective against exposure to appearance-ideal media imagery (Tylka & Wood-Barcalow, 2015). Moreover, positive body image is a malleable construct, which can be fostered through interventions both in childhood and adulthood (Guest et al., 2019; Tylka & Wood-Barcalow, 2015). For example, interventions that involve focussing on body functionality, practising self-compassion, and carrying out self-affirmation exercises have been found to increase aspects of positive body image (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Diedrichs, Halliwell, Peters, et al., 2018; Duncan, Al-Nakeeb, & Nevill, 2009; Halliwell, Jarman, McNamara, Risdon, & Jankowski, 2015; Toole & Craighead, 2016).

To summarise the foregoing discussion, body concerns are prevalent among young people and can have serious consequences; improving body image among young people is a priority, and body image programmes within schools may be helpful. Further, young people with a visible difference may be particularly vulnerable to developing body concerns and experiencing appearance pressures from their immediate and broader social environment. Taking this into account, in this study, we developed an educational board game aiming to promote positive body image, increase knowledge of appearance-related issues, increase acceptance of diversity of appearance, and encourage group discussion and critical thinking about the role that appearance plays in the media, such as using beauty ideals to sell products. In particular, the positive body image-related content included appreciation, acceptance, and respect of the body, body functionality, broad conceptualisations of beauty, and bodily-self-care. This was included in the intervention through psychoeducational information and activity and question cards that encourage players to practise these aspects of positive body image, for example by thinking about their own body functionality, how they might care for their body, or what they appreciate about their bodies.

The game topics are relatively complex and lend themselves to discussion-based activities, therefore we decided that it was suitable to design a game for older primary school children (9-11 years old). The game, 'Everybody's Different: The Appearance Game' (www.appearancegame.com), was developed in collaboration with a UK-based educational board game company. Previous research has shown that board games can be an effective way of facilitating learning and increasing interest in topics including nutrition and healthy eating in children of primary school age, and are suitable to play in a classroom setting (Amaro et al., 2006; Yien et al., 2011).

To ensure that the board game is a useful and effective intervention, we aimed to evaluate its effectiveness by conducting a cluster randomised controlled trial with primary school children aged 9-11 years. We hypothesised that playing 'Everybody's Different: The Appearance Game' (compared to playing an educational board game about anatomy) would (a) increase knowledge of appearance-related issues, (b) increase positive body image, (c) increase appearance-related media literacy, (d) reduce negative perceptions of visible differences and (e) be an enjoyable intervention for children aged 9-11 years.

2. Methods

2.1. Participants

Emails were sent to the headteachers of 11 primary schools in the South-West of England, inviting them to take part. The emails described the opportunity to be involved in an "exciting study to evaluate 'Everybody's Different: The Appearance Game', a new educational board game". If interested in taking part, the headteachers passed information about the research on to the Year Five and Six class teachers at their school and asked them to attend a face-to-face meeting with the research team. In total, the headteachers of three primary schools agreed to take part and the research team met with the relevant teachers of each school separately, where they explained that they were looking for children to take part in a study evaluating an educational board game, the study protocol, and the randomisation procedure. The teachers were then invited to ask any questions.

Participants were Year Five (aged 9 and 10 years) and Six (aged 10 and 11 years) students from each of the three co-educational state primary schools, who took part in the study as part of their lessons during regular school days. Initially, 272 participants were invited to take part, however three students (1.1%) were opted out of the study by their parents. Additionally, two students (0.7%) did not take part because their teachers felt that they would not be able to engage due to learning difficulties, and eight students (2.9%) were absent at Time 1. Therefore, 259 participants took part in the study at Time 1. See Figure 1 for more information about participant allocation.

Participants were aged 9-11 years ($M= 10.26$, $SD= 0.67$). Just over half of the sample were male (53.7%, $n=139$; female, 44.8%, $n=116$, other 1.2%, $n=3$), and one participant did not disclose. Participants were predominantly White (72.2%, $n= 187$), with 8.9% ($n=23$) Mixed Race, 4.2% Asian ($n=11$), 4.2% Black ($n=11$), 1.9% ($n=5$) other ethnicity, 7.3% ($n=19$) reported 'prefer not to say', and 1.2% ($n=3$) did not disclose. Just under half of the sample reported knowing someone with a visible difference (44.9%, $n = 120$).

2.2. Materials

2.2.1. Intervention Game

'Everybody's Different: The Appearance Game' (more information at appearancegame.com) was used as the intervention for this study. The game can be played with two teams of up to four players in each, who must roll a dice and move around the board answering 'Question Cards' (e.g., "True or false? Ideal body shapes have changed throughout history") or completing 'Activity Cards' (e.g., "Before the timer runs out, name as many nice things as you can about someone without focussing on their appearance"; "Look at picture card 6. Can you spot 6 things the boy has done to change his image before he posted his photo on social media?"). The team that reaches the 'finish' square of the board first, wins. The cards are played in numerical order (i.e., 1-35), starting with simple questions that introduce each topic, followed by more difficult, applied questions. The content of the game covers positive body image, visible difference conditions and diversity of appearance, body talk, appearance-related bullying, and appearance ideals in the media. The

positive body image-related content includes questions and challenges relating to body functionality, body appreciation, broad conceptualisation of beauty, and self-care. For example, “Our bodies can do lots of amazing things. Name 3 amazing things our bodies can do,” and “We need to look after our bodies. Name of thing you can do to keep your body healthy”.

The game was developed by researchers at the Centre for Appearance Research at the University of the West of England, Bristol, in the United Kingdom (UK), in collaboration with an educational board game company. An iterative approach was employed, whereby feedback was gathered throughout the development of the game, with input from the developers and appearance-psychology experts who also worked at the research centre. Additionally, parents and children were recruited through centre members who had children, and further snowball sampling, to play the game and give feedback on the content, design, enjoyment and age-specific readability of the game. Finally, the game was piloted at one primary school, which was not involved in the current trial, to test acceptability of the game and gather further feedback from teachers and Year Five and Six pupils. This was used to create the final board game, which was evaluated in this study.

2.2.2. Control Game

Participants in the control condition played a game about the human body, called ‘Anatomix’. The game is played in teams of 2-4 players, who must answer multiple choice questions about the human body to gain puzzle pieces in order to complete a puzzle of the human skeleton, nerves, muscles, or organs. Both educational games involved answering topical question or activity cards in order to progress through the game and win.

2.3. Measures

Data were collected at three timepoints during the study. Baseline data were collected one-week pre-intervention (Time 1), post-intervention data were collected one-week after baseline, immediately post-intervention (Time 2), and follow-up data were collected two-weeks post-intervention (Time 3).

2.3.1. Sociodemographic Information

Sociodemographic information regarding age, gender, and ethnicity was self-reported by participants at Time 1.

2.3.2. Knowledge of Board Game Content

To measure knowledge of the appearance-related issues included within the board game intervention, a knowledge quiz of 12 questions was developed. This included six questions taken directly from the content of 'Everybody's Different: The Appearance Game' (e.g., "True or false? Teasing someone about how they look doesn't hurt their feelings"), and six questions that were created by the researchers (e.g., "What does 'diversity' mean? Circle the correct answer") but were based on the content of the board game. The response format included multiple choice and true or false options. Total scores for knowledge were calculated out of 12, with one point given per correct answer. Kuder-Richardson 20 (KR-20), which measures internal consistency in variables with dichotomous items, was calculated for knowledge scores at Time 1, Time 2 and Time 3 and was 0.62, 0.70 and 0.69, respectively.

2.3.3. Positive Body Image

Positive body image was measured using the Body Appreciation Scale 2-Children (BAS-2C; Halliwell, Jarman, Tylka, & Slater, 2017). This scale contains 10 statements that ask what a respondent thinks and feels about their body (e.g., "I feel good about my body", "I am comfortable in my body"). The scale is completed using a 5-point Likert scale (1= *Never*, 5= *Always*); scores on the items are averaged, with mean scores ranging from 1-5. The BAS-2C is a validated measure of positive body image in children aged 9-11 years, and was adapted from the Body Appreciation Scale 2 (BAS-2; Tylka & Wood-Barcalow, 2015). BAS-2C scores have been shown to have good construct validity, internal consistency, and test-retest reliability with a sample of boys and girls aged 9-11 years (Halliwell et al., 2017). Cronbach's alphas for the current study were 0.78, 0.83 and 0.93 at Time 1, Time 2, and Time 3, respectively.

2.3.4. Media Literacy

Media literacy was measured using The Critical Thinking about Media Messages – Appearance Focus (CTMM-AF, Scull, Kupersmidt, Parker, Elmore, & Benson, 2010) Scale, and the Realism Subscale of the Media Attitudes Questionnaire (MAQ, Irving, DuPen, & Berel, 1998).

The CTMM-AF is a 6-item measure that examines critical thinking about appearance-related messages in the media, using a 6-point Likert scale (1=*Never*, 6= *Always*); scores are summed and can range from 1-36. An example item is “When I look at ads with thin female models, I think about what the people who made the media message want me to believe”. Additionally, the Realism Subscale of the Media Attitudes Questionnaire MAQ was used to examine perceived realism. Two items were taken from this scale: “Normally women (in real life) look like models in ads” and “Normally women (in real life) are as thin as the models in ads”. The scale uses a 5-point Likert scale (1= *Completely disagree*, 5= *Completely agree*) and is scored from 1-5. The questions were slightly adapted to be relevant to boys and girls. This was done by changing ‘women’ to ‘people’ in both questions and adding ‘or muscly’ to question two.

Scores on the MAQ Realism Subscale and CTMM-AF have evidence of adequate to excellent internal consistency and convergent validity with a sample of females in early adolescence (McLean, Paxton, & Wertheim, 2016). The CTMM-AF has been shown to have adequate test-retest reliability within this sample, whereas test-retest reliability was low for the MAQ Realism Subscale (McLean et al., 2016). Cronbach’s alphas for the CTMM-AF in the current study were 0.68, 0.76 and 0.80 at Time 1, Time 2 and Time 3, respectively and 0.75, 0.82 and 0.85 at Time 1, Time 2, and Time 3, respectively for the MAQ.

2.3.5. Feedback on ‘Everybody’s Different’ Board Game

Participants in the intervention condition answered questions about the appearance board game at Time 2, immediately after playing the game. These included yes/no responses to questions “Would you play the game again?”, “Did you learn new things from playing the game?”, “Do you think that other children your age would like to play the board game?” and “Were the rules easy to

understand?” Additionally, qualitative open-ended feedback was collected through the questions “What did you like about the game?”, “Was there anything you didn’t like about the game?” and “Name three things you learned from playing the game”.

2.3.6. Perceptions of Visible Difference

To test whether the board game increased acceptance of diversity of appearance and visible difference, children were shown a computer-generated image of a child either with or without a facial burn scar that matched their own identified gender. In order to reduce priming effects, the children were shown the images only at Time 2 and Time 3. They were shown the same version of the image at both time points. We chose to use children with burn injuries as the visible difference stimuli because burn injuries are one of the most common appearance-altering conditions, which children of this age are able to recognise. This was confirmed during the piloting of the stimuli.

The images were developed by a graphic designer and depicted the head and shoulders of a child aged approximately 11 years old, with a neutral expression, who was wearing a school uniform (see Supplementary Materials). The male and female versions of the image were designed to look as similar as possible, and the versions with a visible difference had burn scarring over the right side of their face. Iterations of the images were reviewed by researchers and clinical psychologists from the authors’ research centre who had experience of working in the area of burns, and were adapted to achieve sufficient realism. For the study, each child was given a copy of the image, which was presented in colour on A4 laminated paper. Participants were asked to rate the child in the image based on a number of personality characteristics (e.g., fun, friendly, popular) to assess their attitudes towards the child. These were scored on a series of visual analogue scales (VAS) ranging from 0 (*Not at all*) to 10 (*Extremely*).

2.4. Procedure

Before recruitment and data collection, approval was gained from the University’s research ethics committee. Prior to the study, the knowledge questions were piloted with 12 children (10 female) aged 9-11 ($M_{age}=10.27$, $SD=1.2$) at a public engagement event where the authors’ research

centre had a stall at a local shopping centre during Bristol Fashion Week to confirm that they were of an appropriate level of difficulty and readability for the purpose of the study.

A matched cluster randomised controlled design was employed to investigate the aims of the study. Simple randomisation, using a coin toss, was carried out by the first author to allocate the two classes in each year group at each school to receive either the control or intervention game.

After each school had agreed to take part in the study, passive parental consent was gained on an opt-out basis. The participants were told that the researchers would be visiting their class on three occasions, that they would be asking the children to complete a survey each time they visited, and that they would be bringing a game that the children would play with their classmates on their second visit. Assent was gained from the participants at the start of the first session. All sessions were led and observed by members of the research team. The participants were blind to the purpose of the study and the group to which they had been randomised. Due to the nature of the intervention, it was not possible to blind the researchers.

At Time 1, one-week pre-intervention, all participants completed a paper-based questionnaire containing the questions relating to knowledge of appearance-related issues, body appreciation (BAS2-C), media literacy (MAQ and CTMM-AF), and sociodemographic information (age, gender and ethnicity). Afterward, the children were informed verbally that the research team would be returning in one week with a game for the students to play.

At Time 2, one week later, classes in the intervention condition played 'Everybody's Different: The Appearance Game' and the control condition played 'Anatomix'. The class teachers assigned the students into groups of eight students per game. The children played the games in two teams of four. Both games were played for 40 minutes and supervised by the researchers, after which, both groups completed the same questionnaire as Time 1, independently. The intervention group also completed feedback questions about 'Everybody's Different: The Appearance Game' at the end of the questionnaire. Following this, participants in all groups were allocated to see an image of either a child with or without a facial burn scar that matched their own identified gender.

Block randomisation was carried out prior to Time 2. Participants in each block (i.e., seeing an image of a child with or without a facial burn scar) were seated around tables together so that they did not see the images in the other conditions. Additionally, each table had four to six participants seated around it, depending on table size, so that they were sufficiently spread out to reduce the likelihood of the children seeing the materials that their peers had been given. Participants were instructed to take the image out of the envelope in front of them and answer the questions about the child in a paper-based questionnaire booklet in silence.

At Time 3, two-weeks following the intervention, all participants completed the questionnaire from Time 1. Following this, they were split into the same participant blocks as at Time 2 and answered questions about the gender matched child with or without a facial burn scar again. After the study, the classes were told the aims of the study and given the chance to ask questions.

2.5. Data Analyses

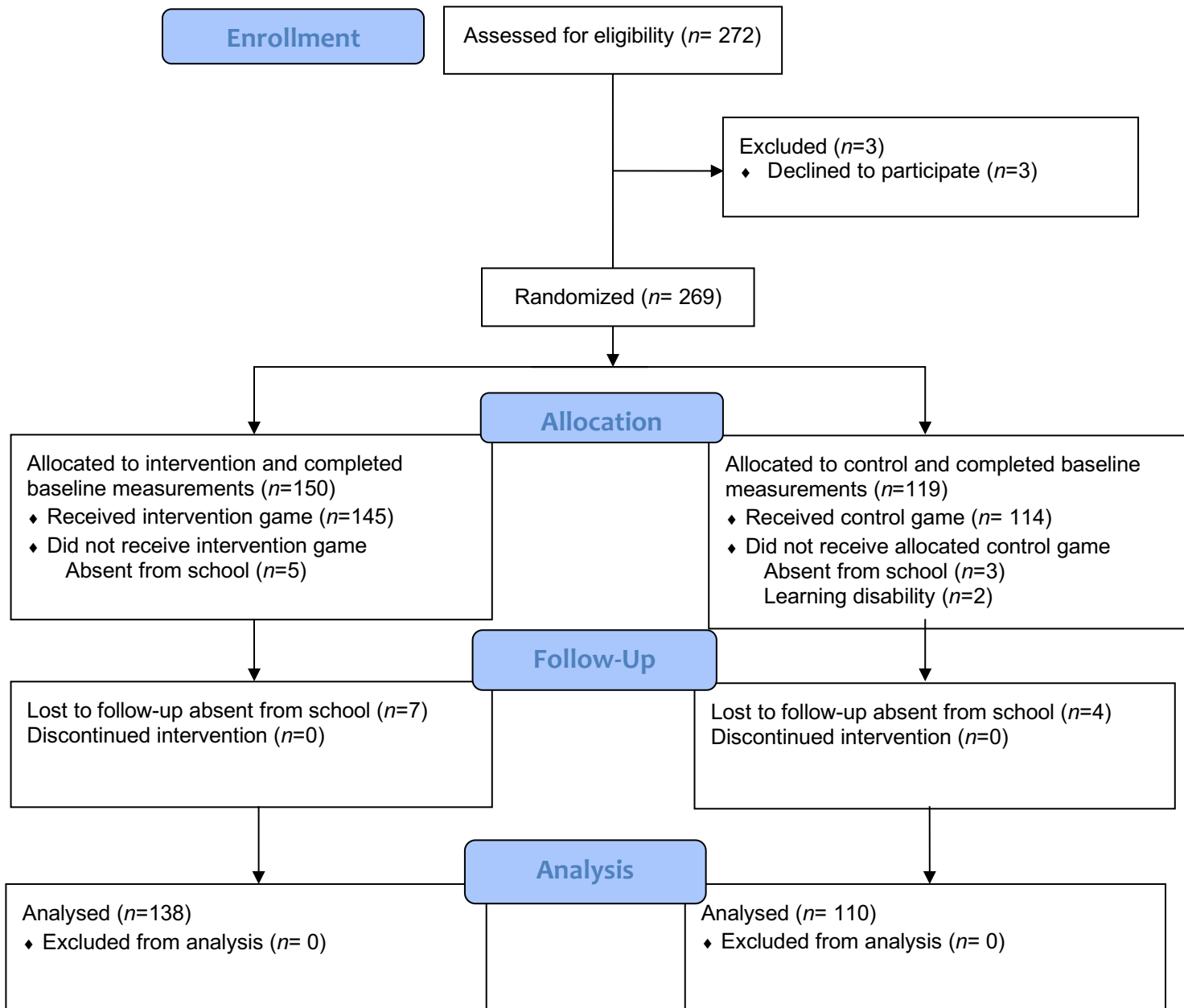
Independent samples t-tests were conducted to determine whether there were significant differences between the intervention and control group at baseline on outcome data. Separate 2 (Group: game intervention vs. control game) x 2 (Time: Time 2 vs. Time 3) mixed repeated measures analysis of covariance (ANCOVA) were conducted for knowledge, positive body image, and media literacy outcome measures. Grand-mean centred Time 1 scores for each outcome measure were used as covariates by subtracting the sample mean from each participant's score (see Van Breukelen and Van Dijk [2007] for information about this method of data analysis). A mixed multiple analysis of variance (MANOVA) was used to examine whether the appearance game had altered participants' perceptions of visible difference.

Qualitative feedback was subjected to basic content analysis, whereby the open-ended responses were sorted into codes or categories and used to determine the frequency of each category within the sample (Green & Thorogood, 2014; Krippendorff, 2018). The first author sorted the data into codes and the sixth author then independently coded 20% of the data to assess

whether there was agreement with the way that the data had been coded. Following this, the first and last authors discussed and agreed on the final conceptual code names. The inter-rater reliability was 98.9%.

Figure 1

CONSORT Diagram of Study Participant Flow



3. Results

Data entry checks were performed to ensure coding fidelity and data veracity. Data validity checks were undertaken, and scale data was examined for the presence of any unduly inferential observations. Outcome measures were checked for excessive skewness and for any floor or ceiling effects and Normal Quantile-Quantile plots were used to assess deviations from normality. The values for skewness and kurtosis fell within an acceptable range for a sample size of 200 or more (Tabachnick, Fidell, & Ullman, 2013) and the normal quantile-quantile plots showed no departure from the assumption of normality. Additionally, student absenteeism at baseline, at post-game play, and at follow-up was minimal (see Figure 1). For these reasons, the analyses were conducted on an available case basis.

Independent samples t-tests revealed there were no baseline group differences for any of the outcome measures (knowledge $t(256) = 1.21, p = .229$; body appreciation $t(249) = .130, p = .897$, critical thinking $t(249) = -0.924, p = .356$; or realism $t(255) = 1.895, p = .059$) suggesting that randomisation was successful. Overall, missing data were minimal (7.8%), and due to non-attendance at school for reasons independent of the study (e.g., illness) consistent with an assumption of missing completely at random (MCAR) and Little's Missing Completely at Random (MCAR) Test (Little, 1988) was not significant.

3.1. Feedback on the Intervention Game

Overall, the quantitative feedback was positive, with the majority of intervention participants reporting that they would play the game again, that they learned new things from playing it, that they thought other children would like to play the game, and that the rules were easy to understand (see Table 1 for more information).

Table 1*Quantitative Feedback about Everybody's Different: The Appearance Game*

Question	Yes <i>n</i> (%)	Mostly <i>n</i> (%)	No <i>n</i> (%)	Missing data <i>n</i> (%)
Would you play the game again?	117 (78.0%)	N/A	26 (17.3%)	7 (4.7%)
Did you learn new things from playing the game?	111 (74.0%)	N/A	31 (20.7%)	8 (5.3%)
Do you think other children your age would like to play the game?	128 (85.3%)	N/A	12 (8.0%)	10 (6.7%)
Were the rules of the game easy to understand?	128 (85.4%)	12 (8.0%)	2 (1.3%)	8 (5.3%)

With respect to the qualitative feedback, the most commonly reported category was that intervention participants liked the format of the game ($n = 57$), including that it was a board game, was played in teams, was discussion-based, and used question and activity cards. Additionally, liking the topics and key messages in the game ($n = 40$) and enjoying learning things from playing the game ($n = 24$) were also commonly reported by participants. See Table 2 for additional details.

Table 2***Summary of Findings from Content Analysis on what Participants Liked About Game (N= 152)***

Category	Frequency (n)	Example quotes from category
Format of the game	57	"I liked the way you had to answer questions to move on the board" "The picture cards they helped you to understand" "I liked all the questions you have to answer"
Topics and key messages in the game	40	"I really liked that the board game taught you about people with differences" "It teaches you that you don't have to look like people on social media" "It makes you focus on more important things other than your appearance"
Enjoyed learning new things from the game	24	"I learned more things that I didn't know before and I really enjoyed the game" "That you learn but have fun at the same time"
The game was fun	13	"The game was very fun"
The game/questions made you think about the issues	13	"I liked that the questions made you think about what you say to one another" "I liked that you had to stop and think about your body"
Did not like the game	4	"I didn't find it fun"

Participants were also asked whether there was anything that they did not like about the game. Almost 60% of the responses ($n = 70$) were that there was not anything about the game that they did not like. The other responses were all rated by less than 10 participants. The most frequently reported categories were that some of the questions were too easy ($n = 8$), that they did not like aspects of the design and rules of the game ($n = 8$), and that the game was too long ($n=6$).

Finally, participants were asked to report three things that they had learned from the game. In total, 285 statements were made about what the participants had learned from playing the game. The findings are outlined in Table 3 and categories reported by eight or more participants are included. The most reported categories were learning that everybody is different ($n = 47$), learning

about different types of appearance-altering conditions and their causes ($n = 39$), that you cannot tell what someone is like from their appearance ($n = 28$), and not to judge people based on their appearance ($n = 26$). The majority of the categories relate directly to the core content of the game (e.g., visible difference, body appreciation and acceptance).

Table 3

Summary of Findings from Content Analysis on What Participants Learned from the Game (N=285)

Category	Frequency (n)	Example quotes from categories
Everybody is different	47	“Everybody is different” “People are all different”
Appearance-altering conditions and their causes	39	“What the reasons are for others’ appearances” “There are many different causes of scars”
You can't tell what someone is like from their appearance	28	“You can't tell anything by how someone looks” “You can't tell what people's personality is like by how they look”
Don't judge someone based on their appearance	26	“You shouldn't judge people on how they look.”
Appearance is not the most important thing	24	“Appearance isn't everything” “It doesn't matter what is on the outside it is what is in the inside that counts”
What diversity means	18	“Diversity means everyone is different and unique”
Appearance appreciation, acceptance, and respect	14	“To accept the way your body looks” “I can appreciate how I look” “To respect my body”
To be kind and respect other people	14	“Don't hurt other people's feelings” “Respect other people's looks”
Definition and/or potential harms of body talk	12	“How ‘body talk’ can affect people” “How other people might feel about body talk”
How to play the game	11	“To play that game” “To let everyone join in”
Being different is a good thing	8	“It's great to be different”

3.2. Intervention Effects

Information about group differences at each time point is presented in Table 4. Effect sizes are reported using partial eta squared.

3.2.1. Knowledge of Appearance-Related Issues

After controlling for mean adjusted knowledge at baseline (Time 1), there was a statistically significant interaction between Group (intervention game vs. control game) and Time (Time 2 vs. Time 3), $F(1, 236) = 4.497, p = .035$, partial $\eta^2 = .019$, a statistically significant main effect for Time, $F(1, 236) = 11.626, p = .001$, partial $\eta^2 = .047$, and a significant main effect for Group $F(1, 236) = 7.945, p = .005$, partial $\eta^2 = .033$. A post-hoc comparison examining differences between randomised groups immediately post intervention, after controlling for mean adjusted baseline knowledge, indicated a statistically significant difference between groups at Time 2, $F(1, 236) = 12.400, p = .001$, partial $\eta^2 = .050$ with a higher mean in the intervention group. At Time 3 there was no statistically significant difference between the groups $F(1, 236) = 2.301, p = .131$, partial $\eta^2 = .010$.

3.2.2. Positive Body Image

After controlling for mean adjusted baseline BAS-2C scores (Time 1), there was no statistically significant interaction between Group (intervention game vs. control game) and Time (Time 2 vs. Time 3), $F(1, 225) = 1.503, p = .222$, partial $\eta^2 = .007$. There was no main effect of Time, $F(1, 225) = 1.114, p = .292$, partial $\eta^2 = .005$, or Group, $F(1, 225) = .752, p = .387$, partial $\eta^2 = .003$.

3.2.3. Media Literacy

After controlling for mean adjusted CTMM-AF baseline scores (Time 1), there was no statistically significant interaction between Group (interventions game vs. control game) and Time (Time 2 vs. Time 3), $F(1, 228) = 2.058, p = .153$, partial $\eta^2 = .009$ and no main effects of Time, $F(1, 228) = .000, p = .996$, partial $\eta^2 = .000$, or Group, $F(1, 228) = .448, p = .504$, partial $\eta^2 = .002$.

Additionally, after controlling for mean adjusted MAQ scores at baseline (Time 1), there was no statistically significant interaction between Group and Time, $F(1, 233) = .153, p = .696$, partial $\eta^2 =$

.001. There was also no main effect of Time, $F(1, 233) = .019, p = .891$, partial $\eta^2 = .000$, or Group, $F(1, 233) = .920, p = .339$, partial $\eta^2 = .004$.

Table 4

Pre- Post- and Follow-up Outcome Measure Scores for Intervention and Control Group

Outcome	Possible range of scores	Intervention			Control		
		Pre-test (n=144)	Post-test (n=139)	Follow-up (n=137)	Pre-test (n=114)	Post-test (n=110)	Follow-up (n=110)
Knowledge	0-12	8.31 (2.35)	9.43 (2.23)	9.55 (2.26)	8.66 (2.31)	8.94 (2.47)	9.50 (2.11)
Body Appreciation	1-5	3.77 (0.77)	3.96 (0.76)	3.9 (0.89)	3.78 (0.82)	3.83 (0.88)	3.89 (0.89)
Critical Thinking (media literacy)	6-36	16.0 (5.53)	15.87 (5.86)	15.77 (6.42)	15.4 (5.05)	15.50 (5.76)	15.65 (5.54)
Realism (media literacy)	1-5	4.09 (0.86)	4.11 (0.87)	4.09 (0.85)	4.33 (0.74)	4.27 (0.74)	4.28 (0.75)

3.2.3. Perceptions of Visible Difference

To determine baseline differences in exposure to visible difference, participants were asked whether they knew someone with a visible difference. Of the whole sample 44.9% ($n=120$) reported 'yes', 21.3% ($n=57$) 'no' and 23.3% ($n=62$) 'don't know'.

A two-way mixed MANOVA was conducted to examine whether there were differences in perceptions of visible difference according to game condition (see Table 5 for descriptive statistics). The results revealed no significant differences between the intervention and control group for perceptions of visible difference in relation to how fun, $F(1, 215) = 0.14, p = 0.71$; friendly, $F(1, 215) = 3.21, p = 0.07$; popular, $F(1, 215) = 0.00, p = 0.96$; clever, $F(1, 215) = 2.16, p = 0.14$; kind, $F(1, 215) = 0.05, p = 0.82$; or confident, $F(1, 215) = 0.71, p = 0.40$, the child in the image was, regardless of whether they had a facial burn or not. There were significant main effects (facial burn vs. no facial burn) whereby participants rated the child with the facial burn as significantly more fun $F(1, 83) =$

6.20, $p < .05$, $\eta^2 = .070$, and kind, $F(1, 83) = 5.59$, $p < .05$, partial $\eta^2 = .063$, than the child without a facial burn. Conversely, participants rated the child without a facial burn as significantly more popular, $F(1, 83) = 5.96$, $p < .05$, partial $\eta^2 = .067$ than the child with a facial burn. These findings were not accounted for by intervention group and are reported elsewhere (Guest et al., in preparation).

Table 5

Post-intervention Scores for Perceptions of Visible Difference Relating to Personality Characteristics of Child With or Without Facial Burn Scar

Outcome	Intervention		Control	
	Visible Difference (<i>n</i> =59)	No Visible Difference (<i>n</i> =67)	Visible Difference (<i>n</i> =44)	No Visible Difference (<i>n</i> =49)
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Fun	6.53 (1.84)	5.21 (2.25)	6.52 (1.91)	5.40 (1.76)
Friendly	7.35 (1.83)	5.84 (2.47)	7.82 (2.11)	7.37 (2.15)
Popular	4.46 (2.35)	5.14 (2.59)	4.47 (2.23)	5.12 (2.32)
Clever	7.03 (1.87)	5.90 (2.44)	7.15 (2.07)	6.91 (2.34)
Kind	7.42 (2.26)	6.12 (2.57)	8.42 (1.76)	7.26 (2.12)
Confident	5.56 (2.47)	5.96 (2.73)	5.92 (2.53)	5.72 (2.74)

Note. Items were rated on a VAS scale from 0 = not at all to 10 = extremely.

4. Discussion

The findings from the current study suggest that a short exposure of 40 minutes to an educational board game relating to positive body image, diversity of appearance, and appearance-related media literacy, can significantly increase knowledge of board game content relating to appearance-related issues in a group of school children aged 9-11 years. The game was also reported to be enjoyable by the majority of participants, and findings from the qualitative content analysis suggest that the children learned and understood the key content and messages of the game. However, while the increase in knowledge of the board game content is a promising finding, the game was not found to significantly increase levels of body appreciation, media literacy, or to change perceptions of visible difference.

Knowledge of appearance-related issues significantly increased in the intervention group from pre-post; however, this was not maintained at follow-up. This may be partly explained by the unexpected finding that scores on the knowledge test significantly improved from post-test to follow-up in the control group. A number of factors may have contributed to this improvement. Firstly, being exposed to the multiple-choice and true-false questions on three occasions may have increased the chance that the children answered correctly, or participants may have been intrigued about the topics included in the knowledge test and asked their peers or parents about them. Within each school year group, one class was assigned to the control group and one the intervention group; therefore, there may have been contamination effects between post-test and follow-up, whereby children from the control and intervention classes discussed some of the content covered in the appearance game. The chance of contamination could be reduced in future studies by randomising by school, rather than class; however, this may increase chances of differences between the groups at baseline. Therefore, it would be beneficial to assess whether the children had discussed the board game content after playing the game by including this as a question at follow-up. Further to this, the KR-20 values for baseline and follow-up were below 0.70 (0.62 and 0.69, respectively), therefore the reliability of the measure was low. This may be partially explained by the items in the knowledge

tests being designed to vary in difficulty; however, the low values indicate that the items do not all correlate well with each other, which suggests that it may not consistently measure knowledge and that the scale may need to be adapted to improve its reliability. This should be taken into consideration when interpreting this finding. It would also be useful to assess whether increasing the number of exposures or using it alongside activities relating to the game content can increase knowledge further, and to examine whether knowledge is maintained over a longer period of time than two weeks.

Conversely, body appreciation did not improve after playing the game. Interestingly, the qualitative data relating to what the children had learned included positive body image-related content (i.e., body appreciation, respect and acceptance), suggesting that the children had understood these concepts, but the game was not sufficient to increase their own body appreciation. A small number of multiple-session interventions have been found to increase positive body image in children of this age (e.g., Halliwell et al., 2016; Hutchinson & Calland, 2011), therefore researchers could examine whether exposing participants to the board game on more than one occasion or using it alongside other interventional materials might increase body appreciation. Further, we measured body appreciation in the present study, however the game contained content relating to other components of positive body image including body functionality, broad conceptualisations of beauty, and self-care. Therefore, it would also be useful to assess these aspects of positive body image in the future.

Similarly, the results showed that the game did not significantly improve media literacy, although the game includes relevant questions and activities (e.g., how appearance is portrayed in the media, how appearance is used to sell products). One possible explanation is that the mean score of children in both conditions was above 8 out of 10 on the measure of critical realism, suggesting that they already had had relatively high levels of media literacy, which can cause ceiling effects. On the other hand, mean scores for critical thinking about messages portrayed in the media were lower, and did not change significantly following intervention. Furthermore, only three

participants reported media literacy as something they had learned during the game. Although effective body image interventions for adolescents of secondary school age often employ media literacy (Yager et al., 2013), children aged below 12 years are still developing critical thinking skills (Livingstone, 2014) and therefore the content of the game may have been challenging for children of this age to understand and apply. It would be helpful to assess whether current content needs to be adapted to be more accessible to this age group, for example through qualitative interviews or focus groups, or collecting data on the social media use of the sample to gauge whether the measure is relevant.

There were also no significant differences between the groups in relation to how they perceived visible differences, which suggests that the game did not alter societal attitudes. Nonetheless, information about the causes and impact of visible differences was the second-most frequent category reported by the children in relation to what they learned from the game. This suggests that a more complex or intensive intervention may be required to target and alter attitudes.

The findings also raise some questions about the methods used to assess perceptions of visible difference because children in both conditions generally rated the child with a burn more favourably than the child without a burn (i.e., as significantly more fun and more friendly). This is an unexpected finding, particularly as literature consistently finds children and adults to have negative attitudes towards individuals with visible differences (Masnari, Schiestl, Weibel, Wuttke, & Landolt, 2013; Rumsey & Harcourt, 2005). An explanation for these findings may be social desirability. Developing the ability to know what is considered socially acceptable is a normal part of child development and, in a school setting where assessment of learning is often summative, participants may have wanted to select the 'correct' or most favourable answers because they thought they were being tested (Klesges et al., 2004). This makes it difficult to determine whether the answers were a true representation of the children's own attitudes and intentions, and in the future

researchers should address potential demand characteristics associated with these constructs, for example by measuring implicit attitudes.

Furthermore, findings from a large mixed-methods study looking at adolescents' attitudes towards visible difference (Stock et al., 2013) found participants to qualitatively report negative reactions towards individuals with visible differences (e.g., shock, fear, avoidance and aversion); however, their quantitative findings were neutral. This supports the notion that there may be issues with the way that perceptions of visible difference were measured in the present study, and future research could be conducted to validate related quantitative measures or collect qualitative data on attitudes using interviews, focus groups, or story completion methods.

Feedback from participants who played the board game was positive, with the majority of participants reporting that they enjoyed the game, would play it again, and thought other children their age would also like to play it. The qualitative data collected showed that the children were interested in the topic and key messages included in the game, which suggests that appearance is a relevant and interesting focus of an intervention for children of this age.

Furthermore, there was positive feedback regarding the format of the intervention, in particular the design of the board game, being able to work as a team, being able to learn new things, question and activity cards, and being encouraged to think about and discuss the topics. On the other hand, a small number of participants also reported aspects of the game that they did not like. For example, finding some of the questions too easy, the design of the game (e.g., not having questions to answer on every square on the board) and some felt that the game was too long. Further testing and feedback with children of this age would help to refine the game so that the format of the game is even more enjoyable. Overall, however, and in line with other studies using educational board games (e.g., Amaro et al., 2006; Yien et al., 2011), our findings suggest that the board game is an engaging and enjoyable intervention for children aged 9-11 years.

Limitations

Although this was a relatively large randomised controlled trial, it also has a number of limitations. Firstly, the study was conducted with participants in one area of the UK, and the majority of participants were White. These factors make it difficult to generalise findings, and future research should be carried out with more ethnically diverse samples with participants from other areas in the UK, or in different countries, to ensure its acceptability.

Additionally, there are some limitations with the way that the game was administered. The children all played the game for 40 minutes, and the cards were presented in the same order for each game, which limits possible random exposure to different cards. However, whilst most groups did finish the game within 40 minutes, some did not. Therefore, these children would not have been exposed to all of the game content. Further to this, the researchers did not record which team won and lost each of the games, which would have helped them to assess whether this influenced how much the children reported enjoying the game, or whether it impacted the effect that the intervention had on them.

A strength of the study is the use of the Anatomix game for the control group. Firstly, Anatomix has a similar procedure to the appearance game, with the children answering question cards to progress. Additionally, Anatomix also involves learning about the body, but does not focus on body image or appearance. Therefore, the two games were comparable, which should have reduced the potential for confounding factors.

One benefit of creating the images of a child's face using computer software was that all versions (male and female, with and without facial burn scar) had the same features, which made it more feasible to make direct comparisons between the characters in the analysis. Furthermore, the images were reviewed by psychologists and researchers who work in UK burn care research and alterations were made until it was felt that the characters were realistic. Nonetheless, viewing computer-generated images may have lacked ecological validity and participants' responses may have differed somewhat to how they would in real life. Future research into attitudes and intended

behaviours towards visible difference could consider using videos of the characters, or an interactive video game experiment to enhance realism.

Another aim of the game was to initiate discussions about appearance-related issues, which may have taken place outside of the intervention. For example, in the playground, during other lessons, or at home. It was not possible to examine whether the game caused real-life changes in attitudes and behaviours or facilitated these discussions. Given that this could have a wider impact on attitudes surrounding diversity of appearance in the general population, it would be beneficial for researchers to explore whether there were any broader impacts of the game.

Finally, in the future, researchers should consider whether increasing board game dosage can enhance its effectiveness and maintain improvements over time. Additionally, they should consider how the game may be used, or altered, to increase acceptance of diversity of appearance. For example, this may be achieved by using the game as a supplement to a series of school lessons about visible difference, appearance diversity, and stigma. Research also suggests that societal attitudes, such as stereotyping and prejudiced attitudes can develop as early as four years (Bigler & Liben, 2006), therefore developing interventions for younger children may be an effective way of tapping into complex societal attitudes as they form. Furthermore, social desirability relating to perceptions of people with visible differences may be less of an issue with younger children.

Conclusion

In summary, findings from the present study suggest that 'Everybody's Different: The Appearance Game' is an enjoyable intervention about appearance-related issues for primary school children aged 9-11 years. Findings suggest that a one-off, inexpensive board game increased knowledge of appearance-related issues; however, the game did not significantly increase body appreciation, media literacy or change perceptions of visible difference. Given that media literacy and positive body image are important components of appearance-related interventions, researchers should consider whether increasing game dosage or using the board game as a

supplement to other classroom sessions and activities can enhance its effectiveness and target these constructs.

References

- Alleva, J. M., Diedrichs, P. C., Halliwell, E., Martijn, C., Stuijzand, B. G., Treneman-Evans, G., & Rumsey, N. (2018). A randomised-controlled trial investigating potential underlying mechanisms of a functionality-based approach to improving women's body image. *Body Image*, 25, 85–96. <https://doi.org/10.1016/j.bodyim.2018.02.009>
- Alleva, J. M., Diedrichs, P. C., Halliwell, E., Peters, M. L., Dures, E., Stuijzand, B. G., & Rumsey, N. (2018). More than my RA: A randomized trial investigating body image improvement among women with rheumatoid arthritis using a functionality-focused intervention program. *Journal of Consulting and Clinical Psychology*, 86(8), 666–676. <https://doi.org/10.1037/ccp0000317>.
- Amaro, S., Viggiano, A., Di Costanzo, A., Madeo, I., Viggiano, A., Baccari, M. E., ... Deepak, S. (2006). Kaledo, a new educational board-game, gives nutritional rudiments and encourages healthy eating in children: a pilot cluster randomized trial. *European Journal of Pediatrics*, 165(9), 630–635. <https://doi.org/10.1007/s00431-006-0153-9>
- Becker, C. B., & Stice, E. (2011). *SUCCEED body image programme manual*. Oxford University Press.
- Bigler, R. S., & Liben, L. S. (2006). *A developmental intergroup theory of social stereotypes and prejudice*. *Advances in child development and behavior* (34th ed.). JAI. [https://doi.org/10.1016/S0065-2407\(06\)80004-2](https://doi.org/10.1016/S0065-2407(06)80004-2)
- Bird, E. L., Halliwell, E., Diedrichs, P. C., & Harcourt, D. (2013). Happy Being Me in the UK: A controlled evaluation of a school-based body image intervention with pre-adolescent children. *Body Image*, 10(3), 326–334. <https://doi.org/10.1016/j.bodyim.2013.02.008>
- Bornioli, A., Lewis-Smith, H., Smith, A., Slater, A., & Bray, I. (2019). Adolescent body dissatisfaction and disordered eating: Predictors of later risky health behaviours. *Social Science & Medicine*, 238, 112458. <https://doi.org/https://doi.org/10.1016/j.socscimed.2019.112458>
- Changing Faces [online] Changingfaces.org.uk. (2018).
- De Jesus, A. Y., Ricciardelli, L. A., Frisén, A., Smolak, L., Yager, Z., Fuller-Tyszkiewicz, M., ... Gattario, K. H. (2015). Media internalization and conformity to traditional masculine norms in relation to

body image concerns among men. *Eating Behaviors*, 18, 137–142.

<https://doi.org/10.1016/j.eatbeh.2015.04.004>

Diedrichs, P. C., Atkinson, M. J., Steer, R. J., Garbett, K. M., Rumsey, N., & Halliwell, E. (2015). Effectiveness of a brief school-based body image intervention 'Dove Confident Me: Single Session' when delivered by teachers and researchers: Results from a cluster randomised controlled trial. *Behaviour Research and Therapy*, 74, 94–104.

<https://doi.org/10.1016/j.brat.2015.09.004>.

Duncan, M. J., Al-Nakeeb, Y., & Nevill, A. M. (2009). Effects of a 6-week circuit training intervention on body esteem and body mass index in British primary school children. *Body Image*, 6(3), 216–220.

Fardouly, J., & Vartanian, L. R. (2016). Social media and body image concerns: Current research and future directions. *Current Opinion in Psychology*, 9, 1–5.

<https://doi.org/10.1016/j.copsyc.2015.09.005>

Government Equalities Office. (2015). *Body confidence campaign*. Retrieved from

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/417186/Body_confidence_progress_report_2015.pdf

Green, J., & Thorogood, N. (2014). Thematic content analysis. *Qualitative Methods for Health Research*. London: SAGE Publications Ltd, 209–218.

Guest, E., Costa, B., Williamson, H., Meyrick, J., Halliwell, E., & Harcourt, D. (2019). The effectiveness of interventions aiming to promote positive body image in adults: A systematic review. *Body Image*, 30, 10–25. <https://doi.org/10.1016/j.bodyim.2019.04.002>

Halliwell, E. (2015). Future directions for positive body image research. *Body Image*, 14, 177–189.

<https://doi.org/10.1016/j.bodyim.2015.03.003>

Halliwell, E., Diedrichs, P. C., & Orbach, S. (2014). *Costing the invisible: a review of the evidence examining the links between body image, aspirations, education and workplace confidence*.

Centre for Appearance Research, University of the West of England.

- Halliwell, E., Jarman, H., McNamara, A., Risdon, H., & Jankowski, G. (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.
- Halliwell, E., Jarman, H., Tylka, T., & Slater, A. (2017). Adapting the Body Appreciation Scale-2 for Children: A psychometric analysis of the BAS-2C. *Body Image, 21*, 97–102.
<https://doi.org/10.1016/j.bodyim.2017.03.005>
- Halliwell, E., Yager, Z., Paraskeva, N., Diedrichs, P. C., Smith, H., & White, P. (2016). Body Image in Primary Schools: A pilot evaluation of a primary school intervention program designed by teachers to improve children’s body satisfaction. *Body Image, 19*, 133–141.
<https://doi.org/10.1016/j.bodyim.2016.09.002>
- Holt, K., & Ricciardelli, L. A. (2002). Social comparisons and negative affect as indicators of problem eating and muscle preoccupation among children. *Journal of Applied Developmental Psychology, 23*(3), 285–304. [https://doi.org/https://doi.org/10.1016/S0193-3973\(02\)00108-9](https://doi.org/https://doi.org/10.1016/S0193-3973(02)00108-9)
- Hutchinson, N., & Calland, C. (2011). *Body image in the primary school*. Routledge.
<https://doi.org/10.4324/9780203830819>
- Irving, L. M., DuPen, J., & Berel, S. (1998). A media literacy program for high school females. *Eating Disorders, 6*(2), 119–131. <https://doi.org/10.1080/10640269808251248>
- Klesges, L. M., Baranowski, T., Beech, B., Cullen, K., Murray, D. M., Rochon, J., & Pratt, C. (2004). Social desirability bias in self-reported dietary, physical activity and weight concerns measures in 8-to 10-year-old African-American girls: results from the Girls Health Enrichment Multisite Studies (GEMS). *Preventive Medicine, 38*, 78–87.
<https://doi.org/doi.org/10.1016/j.ypped.2003.07.003>
- Krippendorff, K. (2018). *Content analysis: An introduction to its methodology* (4th ed.). Sage Publications.
- Little, R. J. A. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association, 83*(404), 1198–1202.

- Livingstone, S. (2014). Developing social media literacy: How children learn to interpret risky opportunities on social network sites. *Communications, 39*(3), 283–303.
<https://doi.org/https://doi.org/10.1515/commun-2014-0113>
- Masnari, O., Schiestl, C., Weibel, L., Wuttke, F., & Landolt, M. A. (2013). How children with facial differences are perceived by non-affected children and adolescents: perceiver effects on stereotypical attitudes. *Body Image, 10*(4), 515–523.
<https://doi.org/10.1016/j.bodyim.2013.05.007>
- McLean, S. A., Paxton, S. J., & Wertheim, E. H. (2016). The measurement of media literacy in eating disorder risk factor research: Psychometric properties of six measures. *Journal of Eating Disorders, 4*(1), 30. <https://doi.org/https://doi.org/10.1186/s40337-016-0116-0>
- Menzel, J. E., & Levine, M. P. (2011). Embodying experiences and the promotion of positive body image: The example of competitive athletics. In J. K. Calogero, R. M. Tantleff-Dunn, S. & Thompson (Ed.), *Self-objectification in women: Causes, consequences, and counteractions* (pp. 163–186). Washington, District of Columbia: American Psychological Association.
<https://doi.org/10.1037/12304-008>
- Neumark-Sztainer, D., Paxton, S. J., Hannan, P. J., Haines, J., & Story, M. (2006). Does body satisfaction matter? Five-year longitudinal associations between body satisfaction and health behaviors in adolescent females and males. *Journal of Adolescent Health, 39*(2), 244–251.
<https://doi.org/https://doi.org/10.1016/j.jadohealth.2005.12.001>
- O’Dea, J. A. (2005). School-based health education strategies for the improvement of body image and prevention of eating problems: An overview of safe and successful interventions. *Health Education, 105*(1), 11–33. <https://doi.org/10.1108/09654280510572277>
- Ofcom. (2018). Children and Parents: Media Use and Attitudes. Ofcom.
- Partridge, J., Julian, D. (2008). *The incidence and prevalence of disfigurement*. London: Changing Faces.
- Paxton, S. J., Neumark-Sztainer, D., Hannan, P. J., & Eisenberg, M. E. (2006). Body dissatisfaction

- prospectively predicts depressive mood and low self-esteem in adolescent girls and boys. *Journal of Clinical Child and Adolescent Psychology*, 35(4), 539–549.
https://doi.org/10.1207/s15374424jccp3504_5
- Richman, L. C. (1978). The effects of facial disfigurement on teachers' perception of ability in cleft palate children. *The Cleft Palate Journal*, 15(2), 155–160.
- Rumsey, N., & Harcourt, D. (2004). Body image and disfigurement: issues and interventions. *Body Image*, 1(1), 83–97. [https://doi.org/10.1016/S1740-1445\(03\)00005-6](https://doi.org/10.1016/S1740-1445(03)00005-6)
- Rumsey, N., & Harcourt, D. (2005). *The psychology of appearance*. McGraw-Hill Education (UK).
- Rumsey, N., & Harcourt, D. (2012). *Oxford handbook of the psychology of appearance*. OUP Oxford.
- Schuck, K., Munsch, S., & Schneider, S. (2018). Body image perceptions and symptoms of disturbed eating behavior among children and adolescents in Germany. *Child and Adolescent Psychiatry and Mental Health*, 12(1), 10. <https://doi.org/doi.org/10.1186/s13034-018-0216-5>
- Scull, T. M., Kupersmidt, J. B., Parker, A. E., Elmore, K. C., & Benson, J. W. (2010). Adolescents' media-related cognitions and substance use in the context of parental and peer influences. *Journal of Youth and Adolescence*, 39(9), 981–998. <https://doi.org/10.1007/s10964-009-9455-3>
- Smolak, L. (2011). Body image development in childhood. In *Body image: A handbook of science, practice and prevention* (pp. 67–75). New York: Guildford Press.
- Stock, N. M., Whale, K., Jenkinson, E., Rumsey, N., & Fox, F. E. (2013). Young people's perceptions of visible difference. *Diversity and Equality in Health and Care*, 10(1), 41–51.
- Strauss, R. P., Ramsey, B. L., Edwards, T. C., Topolski, T. D., Kapp-Simon, K. A., Thomas, C. R., ... Patrick, D. L. (2007). Stigma experiences in youth with facial differences: a multi-site study of adolescents and their mothers. *Orthodontics & Craniofacial Research*, 10(2), 96–103.
<https://doi.org/doi.org/10.1111/j.1601-6343.2007.00383.x>
- Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2013). *Using multivariate statistics* (Vol. 6). Pearson Boston, MA.
- Tatangelo, G. L., & Ricciardelli, L. A. (2017). Children's body image and social comparisons with peers

- and the media. *Journal of Health Psychology*, 22(6), 776–787.
<https://doi.org/10.1177/1359105315615409>
- Thompson, A., & Kent, G. (2001). Adjusting to disfigurement: processes involved in dealing with being visibly different. *Clinical Psychology Review*, 21(5), 663–682.
[https://doi.org/https://doi.org/10.1016/S0272-7358\(00\)00056-8](https://doi.org/https://doi.org/10.1016/S0272-7358(00)00056-8)
- Toole, A. M., & Craighead, L. W. (2016). Brief self-compassion meditation training for body image distress in young adult women. *Body Image*, 19, 104–112.
<https://doi.org/10.1016/j.bodyim.2016.09.001>
- Tylka, T. L., & Wood-Barcalow, N. L. (2015a). The Body Appreciation Scale-2: item refinement and psychometric evaluation. *Body Image*, 12, 53–67.
<https://doi.org/10.1016/j.bodyim.2014.09.006>
- Tylka, T. L., & Wood-Barcalow, N. L. (2015b). What is and what is not positive body image? Conceptual foundations and construct definition. *Body Image*, 14, 118–129.
<https://doi.org/10.1016/j.bodyim.2015.04.001>
- Van Breukelen, G. J. P., & Van Dijk, K. R. A. (2007). Use of covariates in randomized controlled trials. *Journal of the International Neuropsychological Society*, 13(5), 903–904.
<https://doi.org/https://doi.org/10.1017/S1355617707071147>
- Wardle, C., Boyce, T., & Barron, J. (2009). *Media coverage and audience reception of people with disfigurement or visible loss of function. The Healing Foundation.*
- Wilksch, S. M., O’Shea, A., & Wade, T. D. (2018). Media Smart-Targeted: Diagnostic outcomes from a two-country pragmatic online eating disorder risk reduction trial for young adults. *International Journal of Eating Disorders*, 51(3), 270–274. <https://doi.org/10.1002/eat.22825>
- Williamson, H., Griffiths, C., & Harcourt, D. (2015). Developing young person’s Face IT: Online psychosocial support for adolescents struggling with conditions or injuries affecting their appearance. *Health Psychology Open*, 2(2), 1–12. <https://doi.org/10.1177/2055102915619092>
- Yager, Z., Diedrichs, P. C., Ricciardelli, L. A., & Halliwell, E. (2013). What works in secondary schools?

A systematic review of classroom-based body image programs. *Body Image*, 10(3), 271–281.

<https://doi.org/10.1016/j.bodyim.2013.04.001>

Yien, J. M., Hung, C. M., Hwang, G. J., & Lin, Y. C. (2011). A game-based learning approach to improving students' learning achievements in a Nutrition course. *Turkish Online J. Journal of Educational Technology-TOJET*, 10(2), 1–10.