

Is a female physical empowerment campaign effective in improving positive body image, motivation for physical activity, and physical activity behavior in young female adults? A two-study experimental test of “This Girl Can”



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ABSTRACT

This Girl Can is a campaign designed to empower women to increase physical activity. The campaign uses images/videos of women of diverse body weights/shapes, ages and ethnicities being physically active, emphasizing body functionality. First, we examined the effects of multi-session ($N = 3$) exposures to This Girl Can on body functionality, body appreciation and self-compassion (Study 1). Second, we explored if autonomous motivation for physical activity mediated effects of This Girl Can on physical activity (Study 2). Women (Study 1: $N = 186$, M (SD) age = 27.55 (14.01); Study 2: $N = 153$, M (SD) age = 28.31 (11.70)) were randomized to This Girl Can, or control videos/images depicting idealized women of thin/athletic body types being physically active (Study 1), or control videos highlighting physical activity benefits (Study 2). Outcomes were measured at baseline, post-test and 1-week follow-up. Study 1 results showed significant group by time interactions for body functionality (decreasing in the control group), body appreciation and self-compassion (both increased only in the experimental conditions). In Study 2, path analysis revealed no statistically significant mediation effect ($ab = 13.18$, 95 % CI [-107.92, 152.59]) of autonomous motivation. Future interventions designed to promote positive body image and self-compassion should incorporate media focusing on diverse women engaging in self-chosen physical activity.

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1. Introduction

The majority of early research on body image focused on the alleviation of negative body image, such as body dissatisfaction (Tylka & Wood-Barcalow, 2015a). Yet, the promotion of *positive* body image, described as a holistic concept, including accepting, appreciating, and being compassionate to one's body through holding multiple views of beauty (Tylka & Wood-Barcalow, 2015a; Tylka, 2012) appears to hold greater practical utility in fostering positive

health behaviors. This is partly because the mitigation of negative body image, in the absence of promoting positive body image, will lead individuals to tolerate, rather than appreciate their body (Tylka & Wood-Barcalow, 2015a). Indeed, positive body image, such as body appreciation, has shown to predict increases in physical activity in adolescent girls over a 1-year period (Andrew et al., 2016). A recent meta-analysis reviewing mainly cross-sectional evidence found positive body image to be associated positively with intuitive eating (Linardon et al., 2021). However, to examine cause and effect associations, experimental tests or well-controlled interventions are needed. Results of a meta-analysis examined the effects of interventions designed to improve body image revealed small effects (Alleva et al., 2015), but most of the included studies focused on the alleviation of negative body image, such as body dissatisfaction. To date, most experiments examining the impact of *positive* body image have used writing experiments (Alleva & Tylka, 2021). In this two-study investigation, we will examine the effect of repeated exposure to Sport England's 'This Girl Can' (TGC) media campaign in

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promoting positive body image, self-determined motivation for physical activity, and physical activity in young women.

The TGC is a media campaign (Sport England, 2015), which originated in the UK and which has also been adapted in Victoria, Australia ('This Girl Can Vic'; VicHealth, 2018). It was designed to inspire women of diverse body weights, shapes, and with different sport experiences to increase levels of physical activity. Specifically, the TGC campaigns show non-idealized diverse women of various ages, ethnicities and shapes being physically active, putting emphasis on the realities of exercising (e.g., sweaty, red-faced). The campaigns are comprised of videos and still images. Evaluations conducted by Sport England (n.d.) suggest that thousands of women have increased levels of physical activity as a result of the campaign. However, there is a lack of information on how the evaluation was conducted, other than it was via a survey in which women were asked what influence the campaign had on their physical activity levels.

The TGC campaign uses a so-called functionality-based approach to the body, so rather than focusing on appearance, they emphasize how the body feels and what it can do. Body Conceptualization Theory (Franzoi, 1995) suggests that the body can be conceptualized as 'body as process', which emphasizes physical capability and internal senses, or 'body as object', which focuses on the body's appearance. Individuals are expected to experience more positive body image outcomes when focusing on the 'body as process' than when it is attuned to the 'body as object' (Franzoi, 1995). Indeed, promising results from correlational studies have shown that focusing on body functionality (body as process), rather than aesthetics (body as object), is associated with less negative mood and fewer body esteem concerns (Abbott & Barber, 2010; Wasylikiw & Butler, 2014). In a similar vein, other studies have found that appreciating the body's functionality is associated with other desirable outcomes, including self-compassion, life satisfaction, intuitive eating, and holding a broader conceptualization of beauty (Alleva et al., 2017). Self-compassion is of particular relevance in the context of campaigns like TGC given its positive role in the regulation of health-related behaviors, health, and well-being (Sirois et al., 2015; Terry & Leary, 2011).

It appears, however, that idealized content which has a focus on the functionality of the body (consisting of images emphasizing physical ability and what the body can 'do') does not *always* result in more favorable outcomes than campaigns that are appearance-based (consisting of images emphasizing attractiveness). For example, women who view physical functionality-based female media images (thin, attractive and/or toned models engaging in a range of physical activities, including track, running, push-ups, yoga) have a poorer or similar negative impact on body satisfaction, including higher levels of social comparisons and self-objectification compared to women who viewed appearance-based images (Mulgrew & Hennes, 2015; Mulgrew & Tiggemann, 2018; Prichard et al., 2018). A likely explanation for this unexpected result is that, despite including functionality-based images, the scenarios still portray unrealistic representations of thin, attractive, young women displayed in objectified ways (Bozsik et al., 2018). For example, the more recent 'athletic-thin' ideal has emerged, depicted as a toned/thin physique, popularized by the Instagram trend '#Fitspiration' that utilizes images to inspire people to exercise (Tiggemann & Zaccardo, 2015). While these thin/athletic-thin ideals could arguably be presented as functionality-oriented, there is still an emphasis on aesthetic qualities (thinness/tone; Bozsik et al., 2018). The potential positive effect of physical functionality media on women's body image diminishes when images portray female bodies in an idealized manner (Mulgrew & Tiggemann, 2018). This highlights the importance of examining the effects of presentations of *diverse* women's bodies in physical functionality-based media.

Recent research has explored the effects on women's body image after viewing diverse body types in physical functionality-based and

appearance-based images. Williamson and Karazsia (2018) found exposure to plus-sized women (described as not meeting the sociocultural thin ideal) increased body appreciation with no difference between functionality-based and appearance-based images. In a similar vein, Mulgrew et al. (2020) found that exposure to thin models resulted in poorer functionality and appearance satisfaction compared to exposure to images of average-sized women (size 12–14 models) regardless of whether the images were appearance- or functionality-focused. These findings indicate that body-type influences how functionality-based images are interpreted by women (Prichard et al., 2018). Experimental research suggests women exposed to images containing body-type diversity (a wide range of body sizes and appearances, different ethnicities, and models with visible facial and bodily differences) and positivity (e.g., images of overweight women with captions emphasizing appreciation of what the body can do) increased body satisfaction, body appreciation and self-compassion (Cohen et al., 2019; Ogden et al., 2020). This is important in supporting the notion that media containing women with diverse body types and appearances is beneficial to body image, and broadening perceptions of beauty (Cohen et al., 2019; Slater & Tiggemann, 2015). A strength of the TGC campaign is that it incorporates functionality-based imagery *in combination with* realistic portrayals of women's body sizes.

To date, two studies have examined the impact of the TGC campaign (Mulgrew et al., 2018, 2019). In the first experimental study by Mulgrew and colleagues, females aged 17–35 in the experimental condition watched one 1.5-minute video of TGC, while women in the control condition watched a 1.5-minute car advertisement. In the second experimental study, similarly aged female participants viewed 6 videos from TGC and completed six writing engagement tasks about their body's functions (Mulgrew et al., 2019). The authors used a stress management control condition where participants viewed two brief videos and images sourced from headspace (a meditation app) and completed the same six written engagement tasks. TGC improved appearance satisfaction, body appreciation and increased exercise intentions, but these effects were not sustained at a 1-week follow-up (Mulgrew et al., 2019; Mulgrew et al., 2018). While functionality satisfaction increased in one study (Mulgrew et al., 2019), there were no changes in this outcome in the other study (Mulgrew et al., 2018). Further, TGC did not help protect against upward social comparisons. The authors suggested that this finding may have been explained by the 90 s viewing of TGC being an insufficient exposure to offset daily presentations of idealized media (Mulgrew et al., 2018). Thus, one limitation of previous research examining effects of this campaign on body image-related outcomes is the relative lack of investigation into the impact of multiple sessions of TGC on both positive and negative body-image related outcomes. Repeated exposure is more likely to produce effects as the findings by Mulgrew et al. (2019) showed. Another limitation is that none of the existing experimental studies by Mulgrew and colleagues included as their control condition idealized women engaging in exercise. This is despite the fact that TGC is a campaign designed to promote physical activity among women. This is an important omission because only when two different exercise scenarios are compared to each other it is possible to attribute any effects to factors beyond the exercise per se.

The ultimate aim of TGC is to promote physical activity behavior. This is a critically important aim given the low levels of physical activity among females in particular (Guthold et al., 2018) and findings showing that body image concerns serve as a barrier to physical activity (Sabiston et al., 2019). Yet, only the study by Mulgrew et al. (2018) examined as one of their outcomes exercise intentions. Specifically, they found that women exposed to the TGC or #jointmovement video increased their intentions to exercise compared to participants in a neutral (non-exercise) control group. However, it is well established that there is a large intention-

behavior gap. A meta-analysis showed that in adults, intentions only account for 21 % of the variance in physical activity behavior (McEachan et al., 2011). Therefore, the exclusion of a behavioral measure is an important limitation. While reports by Sport England (2016) claim an increase of 250,000 women who took part in regular physical activity and sport after the introduction of TGC (compared to before), to our knowledge no independent scientific evidence using validated behavioral assessments exists to confirm such increases. Thus, our second study will be the first to examine if the TGC campaign achieves what it sets out to accomplish, i.e., to increase physical activity. In addition to examining physical activity behavior, it is important to explore mediating factors explaining the possible effect of TGC (and similar functionality-based campaigns) on physical activity behavior.

Self-Determination Theory (SDT; Ryan & Deci, 2017) can provide a promising theoretical framework to examine effects of the TGC campaign on physical activity behavior. According to SDT, motivation for a behavior can be broadly classified as autonomous or controlled. Autonomous motivation is indicative of volitional behavioral engagement whereby the person enjoys or values the behavior. In contrast, when someone is primarily motivated by controlled reasons, they take part in the behavior due to extrinsic (e.g., because others tell them to do so) or intrinsic (e.g., out of feelings of guilt) contingencies. There is convincing evidence that autonomous, but not controlled, motivation leads to sustained physical activity behavior (Ntoumanis et al., 2021). While the TGC campaign was not specifically designed based on SDT, we posit that many of its characteristics could foster autonomous motivation for physical activity. Specifically, the campaign is designed to empower women to enjoy physical activity through its emphasis on fun, and inspiring women to be active in the way that they choose – whenever, wherever, and however they want. Indeed, choice is a fundamental component of autonomous motivation. The campaign includes stories by women of how they love to be active and the enjoyment they experience from doing so. In turn, enjoyment is an inherent characteristic of intrinsic motivation, which is the most autonomous type of motivation according to SDT. Observing other women enjoy and/or value physical activity could also foster autonomous motivation to be physically active via vicarious means.

In view of the above, we aim to build on existing research exploring the effectiveness of TGC in three important ways. First, we will directly compare realistic depictions of diverse women in TGC (Sport England, 2015; VicHealth, 2018) to idealized versions of women portrayed in physical functionality campaigns in which women are engaged in physical activity. Second, we employ a methodology which includes multi-session exposures to TGC. Third, we examine if autonomous motivation to exercise mediates the effects of the TGC campaign on physical activity behavior.

The aim of study 1 is to explore the effectiveness of multi-session exposures to TGC on women's body functionality satisfaction, body appreciation, and self-compassion. We hypothesize that women who view multisession TGC campaigns will report a significant increase in body functionality satisfaction, body appreciation, and self-compassion from pre-test to follow up, with reductions in the control condition (H1.1). We controlled for age and Body Mass Index (BMI) in these analyses, because previous research has shown that these variables are associated with the outcomes (e.g., He et al., 2020; Murn & Steele, 2020; Tiggemann & McCourt, 2013).

The aim of study 2 is to examine the effects of exposure to the TGC campaign on autonomous motivation to be physically active and to determine if the effects of the TGC campaign on PA is mediated by autonomous motivation. It is hypothesized that autonomous motivation will partially mediate the positive effect of the intervention on total PA levels (H1.2).

2. Study 1

2.1. Method

2.1.1. Research design

A true experimental design was used. Participants were asked to view three sessions of TGC images and videos over ten days. The independent variables were condition (exposure to TGC vs. control campaigns) and time (pre-test, post-test, 1-week-follow-up). The dependent variables were body functionality satisfaction, body appreciation, and self-compassion.

2.1.2. Participants

A total of $N = 236$ participants completed the pre-test, $N = 183$ completed the post-test, and $N = 178$ completed the follow-up test. Thus, the final sample size used in the analyses was 178. There were no differences between completers and non-completers on age, ($t(111.42) = 7.71$; $p = .09$), BMI ($t(218) = -0.25$; $p = .80$), or any of the outcome variables (body functionality satisfaction: $F(1, 234) = 0.07$; $p = .80$; body appreciation: $F(1, 234) = 0.49$; $p = .48$; self-compassion: $F(1, 234) = 1.25$; $p = .26$). The mean age of the final sample was 26.87 ($SD = 13.69$; age range: 17–75), and on average the participants were slightly overweight with a mean BMI of 25.10 ($SD = 6.00$). Inclusion criteria was females 17 years and over who lived in Australia.

2.1.3. Procedure

The research was approved by Curtin University Human Research Ethics Committee (HRE2020–0222). Female participants 17 years and over were invited to participate in an online study that examined the “the impact of media campaigns on the way women feel about their bodies”. They were recruited via a student course credit participant pool (48 %) or Facebook (52 %). The study was completed online via Qualtrics. Participants were presented with an information sheet, and if they wanted to take part, they provided informed consent to continue to the survey. Following consent, participants completed questions about age, height and weight and entered their email address to be contacted for follow-up parts of the study. Participants were randomly assigned by Qualtrics to either the TGC or control condition. Pre-test measures were completed for body functionality satisfaction, body appreciation, and self-compassion. Participants were exposed to session 1 resources immediately after completing the pre-test measures. Participants received an email link 3 days later to complete session 2. Participants received another email link 3 days later to complete session 3. Three days after that they received an email link to complete post-test measures containing the same measures as the pre-test. One week later, participants received the final email link to complete the follow-up questionnaire containing the same measures as the pre/post-test (see Fig. 1 for an overview of the design and timing of assessments).

To ensure fidelity of exposure manipulation, each image in session 2 had a 10 s timer, videos in sessions 1 and 3 played automatically and had timers for the length of each video. This ensured participants could not ‘skip’ materials until the time had passed. Reminder emails to complete the next stage were sent 24 h after participants first email invite, and these emails were sent every 24 h (capped at 4 reminder emails per invite) until the stage was completed or participants opted out of the experiment. At the end of each exposure, the participants were asked the extent to which they paid attention to the images and videos using a rating scale ranging from *not at all* (1) to *very much* (5).

2.1.4. Materials and Measures

2.1.4.1. *‘This Girl Can’ resources.* All materials were taken from ‘This Girl Can’ (Sport England, 2015) and VicHealth (2018) ‘This Girl Can Vic’, which displayed realistic depictions of women exercising,

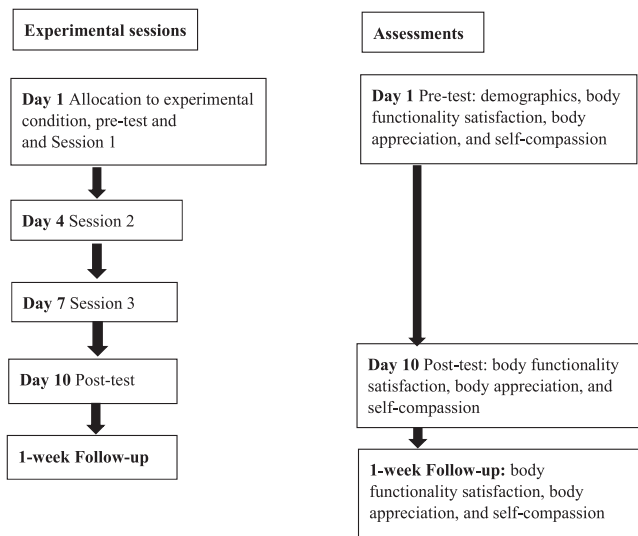


Fig. 1. Study 1 Research Design and Timing of Assessments.

demonstrating physical functionality (Mulgrew, McCulloch et al., 2018). In session 1, participants viewed 6 videos showing diverse women (various body shapes, weights, ethnicity, and ages) participating in sports (6 min). Session 2 consisted of 10 campaign images of diverse women exercising with inspirational quotes (e.g., '#fitgotreal'). Session 3 consisted of 7 videos, depicting diverse women sharing experiences regarding involvement in sport, alongside clips of them playing sport (9.59 min). The Supplementary File includes links to all Experimental and Control Condition Resources for both studies.

2.1.4.2. Control condition resources. Participants in the control condition viewed media campaigns which women are exposed to every day, depicting idealized women of thin/thin-athletic body-type being physically active, demonstrating physical functionality. Media campaigns from popular sports brands (e.g., Nike) of women in figure-hugging active wear were sourced from google images and YouTube. Materials chosen were based on Farquhar and Wasylkiw (2007) concept of "Level of activity", i.e., females had to be engaged in high levels of activity that showed the physical skills of the body to be considered as physical functionality based. Session 1 consisted of 6 video campaigns from sports brands depicting idealized women being physically active (6 min). Session 2 included 10 campaign images of idealized women being active. Images included inspirational quotes ('Will Trumps Fate'). Session 3 included 6 videos of idealized women training and sharing experiences (9.34 min). The experimental and control materials were matched in terms of number and duration of images/videos, eliminating bias associated with differential attention.

2.1.4.3. Control variables. Participants self-reported age, height (cm), and weight (kgs). BMI was calculated using the formula $\text{weight(kg)/height(m)}^2$.

2.1.4.4. Body functionality satisfaction. Body functionality satisfaction was measured using 8-items previously used by Mulgrew et al. (2018). Four items were used to measure the construct, e.g., 'I am satisfied with my physical strength/how my body can move/what my body can do/fitness and health. Four distractor mood items were included to prevent demand characteristics, including 'right now I feel angry/sad/confident/happy', which is common practice in body image research (Knobloch-Westerwick & Crane, 2012). Participants reported their responses on a 5-point Likert scale from *not at all* (1) to *very much* (5). Item scores were averaged to generate an overall

score of body functionality satisfaction, with higher scores signifying greater levels of the construct. The internal consistency has been reported as high ($\alpha > 0.90$) across multiple studies (Mulgrew & Tiggemann, 2018; Mulgrew et al., 2019). Internal consistency was high at each time point (pre-test: $\alpha = 0.84$; post-test: $\alpha = 0.89$; follow-up: $\alpha = .91$).

2.1.4.5. Body appreciation. The 10-item Body Appreciation Scale-2 (BAS-2; Tylka & Wood-Barcalow, 2015b) measured trait body appreciation. Participants responded on a 5-point Likert scale from *never* (1) to *always* (5) to statements such as 'I respect my body'. One overall body appreciation score is calculated by averaging all responses, with high scores indicating greater body appreciation. The BAS-2 has demonstrated good construct, criterion, discriminant, and incremental validity in female undergraduate student and community samples (Tylka & Wood-Barcalow, 2015b). The BAS-2 measure shows high internal consistency in female participants ($\alpha > 0.94$) and 3-week test-retest reliability (Tylka & Wood-Barcalow, 2015b). In this sample the scale had very high internal consistency at pre-test ($\alpha = 0.95$), post-test ($\alpha = 0.96$) and follow-up ($\alpha = .96$).

2.1.4.6. Self-compassion. The 12-item self-compassion scale-short form (SCS-SF; Raes et al., 2011, pp. 702) was used to measure trait self-compassion. Women responded on a 5-point Likert scale from *almost never* (1) to *almost always* (5) to items like 'When something upsets me, I try to keep my emotions in balance'. Four items were reversed. Item scores were averaged to give a single score, with higher scores indicating greater self-compassion. The SCS-SF had high construct, convergent, discriminative validity and predictive utility when administered to English-speaking community samples (Neff, 2015; pp. 702; Raes et al., 2011; pp. 702). The SCS-SF had high 3-week test-retest reliability and internal consistency ($\alpha = 0.86$; Raes et al., 2011, pp. 702). In this sample the SCS-SF had high internal consistency at pre-test ($\alpha = 0.86$), post-test ($\alpha = 0.89$) and follow-up ($\alpha = .91$).

2.1.5. Statistical analyses

The analyses were completed through SPSS Version 26. Linear mixed models (LMM) were performed because observations (level 1) were nested within individuals (level 2). Four LMM analyses were conducted using the Restricted Maximum Likelihood (REML) method. The independent variables (time and group) were group-mean centered. For each dependent variable, a pseudo- R^2 value was calculated by comparing the variance of each model without the predictors against the variance of the full model. RWeb was used to plot interaction effects.

2.2. Results

2.2.1. Preliminary analyses

Four univariate outliers (2 for BMI and 2 for paid attention to images/videos at exposure 1) were winzorised. Intra-class correlation coefficients ranged from .19 (body appreciation) to .29 (body functionality satisfaction). Results from each manipulation showed that participants reported paying attention to the images and videos (exposure 1: $M(SD) = 4.17(0.86)$; exposure 2: $M(SD) = 3.76(1.02)$; exposure 3: $M(SD) = 4.20(0.88)$). Table 1 presents the descriptives and correlation coefficients between age, BMI, and the outcome variables.

2.2.2. Main analyses

Table 2 presents the main results of the study. No group effects were observed, with time effects only evident for body functionality satisfaction. All interaction effects were significant. The interaction effect for body functionality satisfaction is presented in Fig. 2. Simple

Table 1
Overall Means (SD) and Bivariate Correlations between Age, Body Mass Index, and All Outcome Variables.

Variable (possible score range)	M	SD	2	3	4	5
1. Age	25.52	12.63	.36**	-0.04	.07	.24**
2. Body Mass Index	25.09	5.72		-0.15**	-0.15**	-0.02
3. Body functionality satisfaction (1–10)	2.91	.89			.59**	.45**
4. Body appreciation (1–5)	3.17	.89				.71**
5. Self-compassion (1–5)	2.91	.73				

Table 2
Effects of Age, Body Mass Index, Group and Time on Body Functionality Satisfaction, Self-Compassion, and Body Appreciation.

	Estimate	SE	95 %CI	p	Pseudo R ²
<i>Body functionality satisfaction</i>					70.99
Age	.001	.005	-0.01,.01	.90	
BMI	-0.02	.01	-0.04, -0.003	.03	
Group	-.03	.13	-0.29,.23	.82	
Time	-0.10	.04	-0.18, -0.02	.01	
Group × Time	.18	.05	.08,.29	.001	
<i>Body appreciation</i>					80.40
Age	.01	.01	-0.002,.02	.10	
BMI	-0.03	.01	-0.05, -0.01	.007	
Group	-.06	.13	-0.33,.20	.64	
Time	-0.03	.03	-0.09,.03	.37	
Group × Time	.11	.04	.03,.20	.01	
<i>Self-compassion</i>					78.76
Age	.01	.004	.01,.02	.001	
BMI	-0.01	.01	-0.03,.003	.11	
Group	-.10	.11	-0.32,.11	.33	
Time	-0.01	.03	-0.06,.04	.67	
Group × Time	.12	.04	.05,.19	.002	

HLM 2-Way Interaction Plot

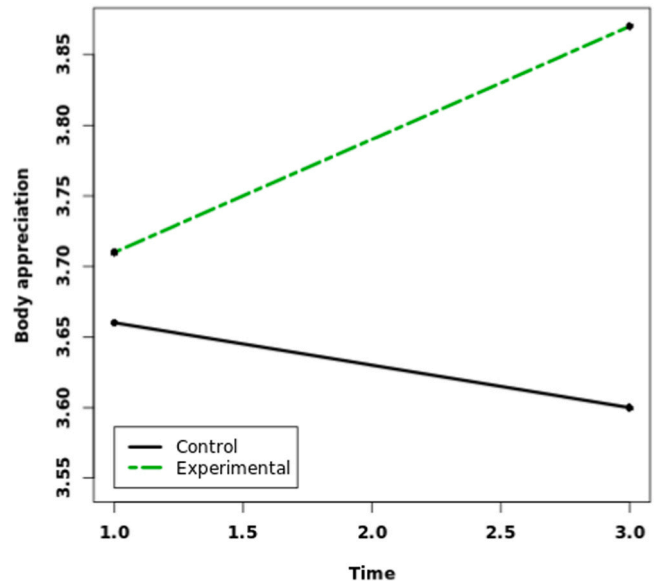


Fig. 3. Time by Group Interaction in Body Appreciation.

HLM 2-Way Interaction Plot

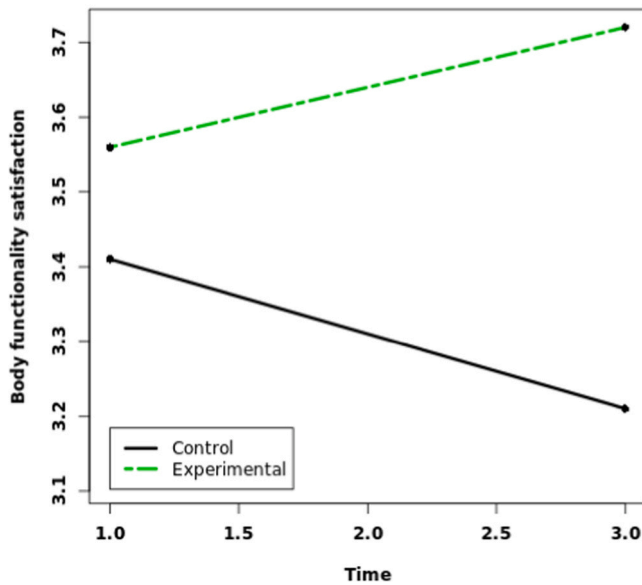


Fig. 2. Time by Group Interaction on Body Functionality Satisfaction.

slopes analysis revealed that the positive increase in body functionality satisfaction in the experimental group failed to reach statistical significance ($b = 0.08$; $p = .07$), whereas in the control group, body functionality satisfaction decreased over time ($b = -0.10$; $p = .002$). Further, we examined the interaction between time and group for body appreciation. The interaction plot is presented in Fig. 3. Again, results of simple slopes analysis revealed an increase over time in body appreciation in the experimental group ($b = 0.08$; $p = .01$) with a lack of change in the control group ($b = -0.03$; $p = .34$).

HLM 2-Way Interaction Plot

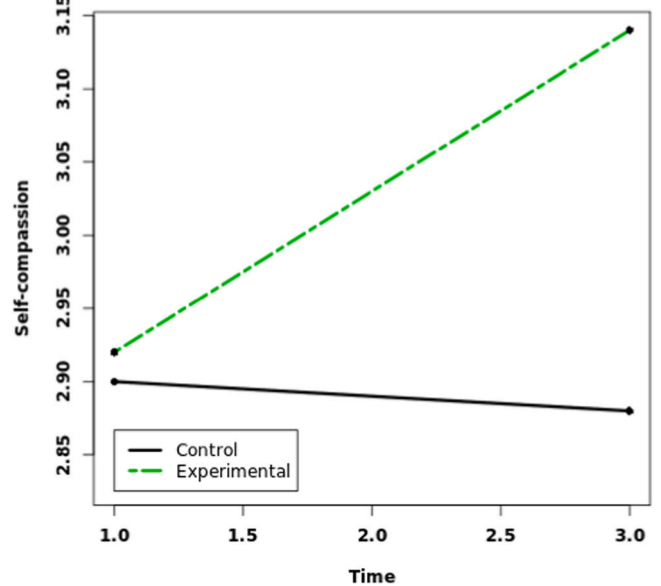


Fig. 4. Time by Group Interaction in Self-Compassion.

Finally, the interaction plot for self-compassion is presented in Fig. 4. Simple slopes analysis revealed an increase in self-compassion over time in the experimental group ($b = 0.11$; $p < .001$), with no change in the control condition ($b = -0.01$; $p = .75$).

3. Discussion

The first hypothesis (H1.1) was partly supported. Regarding functionality satisfaction, simple slopes analysis revealed a decrease in functionality satisfaction over time in the control condition, with a marginal, but non-significant ($p = .07$), increase in the experimental condition. In comparison, two previous studies using the TGC campaign material have shown inconsistent results with one showing a positive effect (Mulgrew et al., 2019), while another failed to observe an effect (Mulgrew et al., 2018). It is important here to note that in contrast to the studies by Mulgrew and colleagues, in our study, both the experimental and control conditions depicted videos and images focused on body functionality within a physical activity context, with the difference between the conditions being the sizes and diversity of the women presented in the exposures. The decrease in the control condition could be explained by observing idealized thin/thin-athletic women exercising that the participants could have difficulty relating to which could have subsequently undermined their satisfaction with their own functionality. Further, videos and images that combine functionality with appearance-based idealized notions of beauty (like our control condition) in a physical activity context may undermine any positive effects on functionality.

Our results showed that multiple exposures to TGC improve body appreciation and self-compassion, effects which persist at least one week after the final exposure. In regard to the effects on body appreciation, our finding is concordant with results by Mulgrew et al. (2018), but we showed that the effect was sustained at 1-week follow-up, where they did not observe this sustained effect. It is likely that the repeated exposure to the campaign videos and images over three sessions spread across six days that we adopted explains this sustained effect. In contrast, Mulgrew and colleagues adopted a single exposure paradigm.

Improvements in body appreciation could be explained by the observation of pleasurable engagement in physical activity, which is denoted as a protective factor which enhance positive embodiment in Piran (2015) Embodiment theory. Further, body appreciation may be fostered by observing body diverse women taking part in physical activities that challenge appearance standards and gender stereotypes, which aligns with one of the Mental Freedom protective factors, specifically the 'freedom from stereotypes of gendered appearance standards' proposed by Piran (2015). Both the experimental and control conditions in our experiment had a focus on body functionality, which according to Franzoi (1995) Body Conceptualization Theory will result in improvements to body image, due to a focus on 'body as process' (i.e., a focus on what the body can do). However, the fact that only the exposure to body diverse women engaging in physical activity improved body appreciation may be explained by the combination of 'body as process' and 'body as object' (i.e., a focus on the body's appearance) features in the control exposure. Specifically, while the control condition included women engaged in physical activity (thus emphasizing the body as process), these women had idealized thin/athletic body types, thus there was also a focus on body as object. The decrease in body functionality satisfaction in the control group may be explained by the 'body as object' features of the videos and images overriding any influence of the 'body as process' characteristics. Thus, we add to existing literature by showing that it is not exposure to images and videos portraying body functionality that improves body appreciation but observing realistic depictions of diverse women (in terms of size, age, ethnicity etc.) enjoying exercise.

A similar effect was observed for self-compassion. This outcome has not previously been examined in relation to TGC. Self-compassion is a broader construct than our other outcome variables as it relates to feelings about the whole self, and hence it is encouraging that our experiment can change how women relate to themselves at a global level. Indeed, increasing self-compassion has positive

repercussions for self-regulation of health-related behaviors, health, and well-being (Sirois et al., 2015; Terry & Leary, 2011). Additionally, self-compassion can protect against media-related body ideal pressure, thin-ideal internalization and eating disorders (Braun et al., 2016).

The primary aim of TGC was to promote physical activity among women, and results from Study 1 showed that key correlates of physical activity behavior, including body appreciation (Sabiston et al., 2019) and self-compassion (Phillips & Hine, 2021; Wong et al., 2021), can be improved via exposure to the campaign. However, it still leaves the question as to whether, and how, the campaign is efficacious in improving physical activity, which was therefore examined in Study 2.

4. Study 2

4.1. Method

4.1.1. Research design

A true experimental design was used. Participants were randomly assigned on a 1:1 basis into either the TGC intervention group ($n = 73$) or the control group ($n = 80$). Participants viewed an exposure to a campaign video every three days over a two-week period, with five exposures in total. Autonomous motivation (the mediator) was assessed at pre-test and post-test, whereas physical activity (the outcome) was assessed at pre-test and at 1-week follow-up.

4.1.2. Participants

A separate participant pool from Study 1 was used in the present study. Participants ($N = 153$) were women aged 18–76 (M age = 28.39; $SD = 11.77$) with a mean body mass index of 24.39 ($SD = 4.90$). Most participants identified as Australian (63.60 %) with some participants identifying as European (9.10 %), North Asians (2 %), and South Asians (10.10 %). Fifteen participants did not to answer the question about ethnicity. Participants were currently undergraduate (45.5 %) or postgraduate (5.1 %) University students or had completed an undergraduate (13.1 %) or postgraduate (12.1 %) degree. The highest level of completed education for the remaining participants were high school (22 %) or less than high school (2 %).

4.1.3. Procedure

Ethics approval was granted by Curtin University Human Research Ethics Committee (HREC Number 2020–0204). Recruitment for participants was through Curtin University's School of Psychology participant pool and social media platforms. Women aged 17 and above were invited to take part in a study that examined the "the effects of mass-media physical activity promotion campaigns on women's physical activity levels and motivation towards exercising". Participants were required to read an information sheet and provide their consent via an online consent form. All components of the study were completed online. Participants inputted their non-identifiable information on the demographic sheet, completed the baseline motivation and physical activity measures and were randomly assigned into the TGC intervention group or the control group on a 1:1 basis using the Qualtrics randomization function. Participants subsequently viewed a short campaign video and were asked to answer two post-exposure questions (e.g., "In the previous campaign video, were the individuals shown engaging in physical activity?" and "Have you seen this particular campaign before?") by ticking 'Yes' or 'No'. This was done to check if the participants had paid attention to the videos and whether they had prior knowledge of the campaigns which could have influenced their responses. Participants received an email every three days for two weeks with a link to the next survey. Each survey asked participants to view a different campaign video and they were asked the two

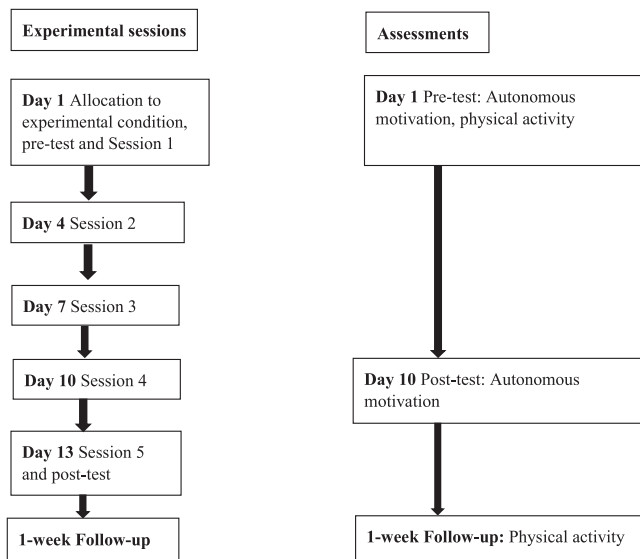


Fig. 5. Study 2 research design and timing of assessments.

post-exposure questions. One week after survey five, participants completed a follow-up survey containing the motivation and physical activity measures. Fig. 5 presents an overview of the design and assessment timing.

4.1.4. Materials and measures

4.1.4.1. This Girl Can campaign videos. Five TGC campaign videos were included in this study with a different video presented at each exposure. The TGC videos depicted women of various ages, abilities and body shapes being active in a variety of contexts (e.g., running, swimming, climbing) and in realistic manners (e.g., sweating, red-faced, with body-fat) (Sport England, 2015; VicHealth, 2018). The TGC videos ranged from 30 to 90 s in duration and varied in their content (e.g., two videos were full length campaign videos and two videos were single person anecdotes). All videos were downloaded from YouTube. **Control physical activity campaign videos.** Five different control campaign videos were included, with one presented at each exposure. These videos were selected based on their intent to promote or increase PA in a general public by highlighting the benefits of being physically active on people's health and wellbeing. The videos included messages by relevant authorities (e.g., Australian Institute of Sports Chief Medical Officer and the World Health Organization) on the health benefits of being physically active, a former sport star talking of the importance of staying physically active, and tips presented visually on how to accumulate more physical activity into daily life. To match the TGC videos in terms of exposure duration, the control videos ranged from 30 to 90 s in duration and varied in their content (e.g., two videos were full length campaign videos and two videos were single person anecdotes). All videos were downloaded from YouTube.

4.1.4.2. Physical activity. The IPAQ-SF (Craig et al., 2003) is a self-report questionnaire that assesses an individual's total PA Metabolic Equivalents (METs) in the last 7 days. METs are a practical method for quantifying the energy cost of activities as multiples of resting metabolic rate (Byrne et al., 2005). Participants reported the frequency and duration of their sitting, walking, moderate-intensity, and vigorous-intensity physical activity over the past seven days. Total PA was calculated by multiplying the minutes spent in vigorous-intensity, moderate-intensity, and walking activity per week by the average MET values of 8.0, 4.4, and 3.0 respectively. These scores were then summed together to achieve the overall METs score. An example item is "During the last 7 days, on how

many days did you do vigorous physical activities like heavy lifting...". Higher scores on the IPAQ-SF represent higher levels of total PA behavior. The IPAQ-SF tends to overestimate physical activity levels (Lee et al., 2011), yet is the most widely used self-report physical activity questionnaire and has demonstrated good to excellent test-retest reliability in previous research (Silsbury et al., 2015).

4.1.4.3. Motivation for physical activity. The Behavioral Regulation for Exercise Questionnaire-3 (Markland & Tobin, 2004) was used to assess autonomous motivation for physical activity. Four items assess each type of motivation; intrinsic, integrated, and identified regulation. The three subscales were combined into a composite score of autonomous motivation. Participants were asked to self-report on the extent to which they agreed with statements using a 5-point Likert Scale, ranging from 0 (*not true of me*) to 4 (*very true of me*). An example item for each scale is "I exercise because it's fun" (intrinsic motivation), "I exercise because it's consistent with my life goals" (integrated), and "It's important to me to exercise regularly" (identified). In past research, the BREQ-3 subscales have been found to have adequate internal consistency ($\alpha=0.68-0.84$) and convergent and construct validity (Costa et al., 2018; Zamarripa et al., 2018). Coefficient alpha of the autonomous motivation scale in the current study was .95 at baseline and post-test.

4.1.5. Statistical analyses

Mplus version 8.6 (Muthén & Muthén, 1998) was used to estimate direct (a , b , and c') and indirect effects (ab) of the intervention on physical activity via autonomous motivation. Path analysis with manifest variables was used as the primary statistical model and missing data were accounted for by full information maximum likelihood estimation (FIML; Enders, 2010). We relied on non-symmetric 95% bootstrap confidence intervals (CI) to assess indirect effects; if the 95% CI did not include zero, it was considered evidence of mediation (Hayes & Rockwood, 2017). The bootstrap CIs were based on 5000 bootstrap samples, which together provide an empirical representation of the sampling distribution of the indirect effect (ab). The unstandardized coefficients from the path analysis were used as effect size measures (cf. Baguley, 2009), and we primarily relied on those when interpreting the magnitude of the effects. The predictor was a binary variable representing intervention and control group. The mediator autonomous motivation was assessed at pre-test and post-test, whereas physical activity was assessed at pre-test and follow-up. We controlled for previous levels of the mediator and outcome in the analyses. The significance level was set to .05 in the analyses. Due to the forced choice format in Qualtrics which was used to collect the data, participants could not proceed without responding to each question, hence there were no missing data.

Model fit was evaluated with conventional fit indices such as the comparative fit index (CFI), the Tucker-Lewis Index (TLI), the standardized root mean square residual (SRMR), and the root mean square error of approximation (RMSEA). CFI and TLI values around 0.90 and SRMR and RMSEA values around 0.08 indicated acceptable model fit (Marsh, 2007). Omega reliability coefficients (ω) and bootstrap confidence intervals were calculated based on the approximate and closed-form solution proposed by Hancock and An (2020).

4.2. Results

The majority (68.12 %) of participants reported not having seen the campaigns previously. The majority of participants (85.20 %) responded correctly to the question about whether people in the videos were engaged in physical activity on all five exposures. The remaining participants responded incorrectly on one or maximum

Table 3
Descriptive Statistics for the Intervention and Control Groups.

	n		M		SD		Min.		Max.		Kurtosis		Skewness	
	Int.	Cont.	Int.	Cont.	Int.	Cont.	Int.	Cont.	Int.	Cont.	Int.	Cont.	Int.	Cont.
AM1	73	80	3.34	3.54	0.93	1.03	1.50	1.33	5.00	5.00	-0.95	-0.84	0.02	-0.38
AM2	38	42	3.50	3.69	0.98	0.94	1.50	1.17	5.00	5.00	-0.80	0.30	-0.02	-0.54
PA1	73	80	2450	2864	2474	2301	0	0	17,964	10,212	20.76	0.80	3.61	1.01
PA3	39	45	2560	3355	2237	3249	0	132	7470	19,026	-0.38	11.95	0.77	2.96

Note. AM1 = autonomous motivation pre-test, AM2 = autonomous motivation post-test, PA1 = physical activity pre-test, PA3 = physical activity follow-up, Int. = intervention group, Cont. = control group.

Table 4
Direct effects of the intervention on autonomous (AM) at post-test and self-reported physical activity (PA) at follow-up.

	b	SE	p	95% CI	
				LL	UL
Direct effects					
c' path					
Group → PA3	-280.08	471.52	.553	-1275.43	627.65
a path					
Group → AM2	0.03	0.11	.777	-0.18	0.25
b path					
AM2 → PA3	416.74	328.40	.204	-297.68	962.62
Autoregressive effects					
PA1 → PA3	7.80	2.13	< 0.001	4.27	12.50
AM1 → AM2	0.91	0.06	< 0.001	0.79	1.04

Note. AM1 = autonomous motivation pre-test, AM2 = autonomous motivation post-test, PA1 = physical activity pre-test, PA3 = physical activity follow-up.

two exposures, thus everyone responded correctly on at least three exposures. Therefore, we retained everyone in the analyses. Descriptive statistics for the intervention and control groups are presented in Table 3. Reliability estimates (ω) for autonomous motivation were 0.948 (95% CI [0.933, 0.959]) and 0.953 (95% CI [0.928, 0.968]) at baseline and post-test, respectively. Model fit of the path model was acceptable, $\chi^2 = 4.975$, $df = 4$, $p = .2899$, CFI = 0.993, TLI = 0.989, RMSEA = 0.040 (90% CI [0.000, 0.134]), SRMR = 0.046, and the direct effects are presented in Table 4. With regards to the direct effects, the intervention did not have statistically significant direct effects on autonomous motivation or physical activity. Furthermore, the effect of the intervention was not mediated by autonomous motivation ($ab = 13.18$, 95% CI [-107.92, 152.59]). Thus, no clear statistical evidence of mediation through autonomous motivation was found in the current study.

4.3. Discussion

Results from study 2 revealed no effects of the TGC manipulation on physical activity via autonomous motivation, thus H1.2 was not supported. Thus, exposure to the campaign did not increase enjoyment and/or perceived value of engaging in physical activity, despite the campaign's emphasis on fun, enjoyment, and choice. It is possible that exposure to the TGC campaign impact psychological needs (for example the needs for autonomy and competence) instead of autonomous motivation. The satisfaction of psychological needs have been shown to directly predict physical activity (Teixeira et al., 2012) and other health behaviors (Ntoumanis et al., 2021). The provision of choice in types and forms of exercise promoted could conceivably satisfy the need for autonomy. The TGC campaign may also help women feel a sense of competence as women are portrayed as being skilled and capable in various types of PA (e.g., running, climbing, swimming). As competence is the experience of mastery and adequacy one feels in oneself, the presentation of women exercising in a multitude of ways may foster feelings of competence, whilst reducing a fear of judgement or insecurity women may feel towards being active. Finally, the diverse

representation of women with all body types, functional abilities, and ethnic backgrounds, may foster relatedness to a target audience that is inclusive of all women. Thus, it may be important that future researchers include assessments of psychological needs in similar experiments. An alternative hypothesis is that the TGC did not satisfy the psychological needs and hence it might also be worth testing whether explicitly targeting the three needs in such campaigns may increase their effectiveness.

To our knowledge this is the first scientific examination of the effect of TGC on physical activity behavior. This is somewhat surprising given that the aim of the TGC is to increase physical activity. Indeed, there are claims in the non-peer reviewed literature (surveys conducted by the TGC campaign organizers) that the campaign has helped thousands of women become more physically active (Sport England, n.d.). However, our results, based on a tightly controlled experiment, do not support this claim. Previous systematic literature reviews and meta-analyses examining the effects of mass media campaigns on changes in physical activity behavior found 7 out of 18 campaigns (Leavy et al., 2011) and 3 out of 9 studies (Abioye et al., 2013) were successful in achieving this outcome, thus overall demonstrating limited efficacy. In that light, our results are less surprising.

5. General discussion

The overarching aims of the present studies were two-fold: 1) to examine the effects of Sports England's (2015) TGC campaign on positive body image-related variables (body functionality satisfaction, body appreciation and self-compassion), and 2) to explore if autonomous motivation mediated any effects of the experiment on physical activity engagement. In Study 1, we identified a significant effect of TGC on body appreciation and self-compassion, with reductions in body functionality in the control group. The results of Study 1 add to the literature by showing that it is not the observation of functionality that improves body appreciation and self-compassion, but exposure to diverse women of a range of sizes, ethnicities, and ages engaging in physical activity that account for these effects. The results from Study 2 revealed that TGC had no effect on physical activity either directly or via autonomous motivation. This is an important finding given the purpose of the TGC campaign was to increase physical activity in diverse groups of women. Taken together, our results suggest that improvements in body appreciation and self-compassion do not translate to increases in physical activity.

5.1. Implications for theory and practice

Our results have some important implications for theory and practice. Results from Study 1 suggest that exposure to body diversity is more important in improving positive body image outcomes than observing images and videos espousing body functionality. Few positive body image theories, (e.g., Acceptance Model of Intuitive Eating; Augustus-Horvath & Tylka, 2011; Body Conceptualization Theory; Franzoi, 1995; Developmental Theory of Embodiment; Piran, 2002, 2015, 2016) explicitly include

considerations of (exposure to) body diversity. Extending these theories to incorporate body diversity as a key construct, including specifications of how it might interact with body functionality, would be a worthwhile future research endeavor. The result pertaining to the importance of body diversity, over and above body functionality, also has important implications for the design of future interventions aimed at promoting positive body image. Specifically, it may be important to limit the use of media portraying idealized female bodies in a functional stance and replace these with images of body diverse women engaged in physical activity. Results from Study 1 also revealed that self-compassion can be improved via three exposures to TGC. This is encouraging, as exposure to TGC is a quick, cheap, and scalable way to increase self-compassion compared to more traditional approaches (e.g., 8-week course on Mindful Self-Compassion; Neff & Germer, 2013, or compassion-focused therapy; Gilbert, 2010).

Multi-component interventions may be needed to change physical activity behavior. For example, in addition to TGC material, interventions could include a selection of relevant behavior change techniques (BCTs). A Behaviour Change Wheel (Michie et al., 2011) approach to intervention development could be used to identify relevant BCTs, which could complement the TGC campaign material.

5.2. Strengths and limitations

The main strengths of both studies included the employment of true randomized experimental designs which provide cause-effect evidence, and the use of multiple exposures to the campaign material, which had only been adopted in one other previous study (Mulgrew et al., 2019). We also examined effects of TGC on physical activity behaviour for the first time. One previous study (Mulgrew et al., 2018) included a measure of exercise intention and found a short-lasting effect (which was not sustained 1 week later), however, the intention-behaviour gap is well established (Rhodes & deBruin, 2013), thus emphasizing the importance of including behaviour measures. Further, the control conditions we used were exercise-specific (compared to previous studies which used non-exercise controls; Mulgrew et al., 2019; Mulgrew et al., 2018) and in Study 1 it was also functionality-oriented. An additional strength of the studies was the wide age range of the participants. The TGC aims to inspire women of all ages to be physically active, yet previous studies examining the effects of TGC have not included women above age 51 (Mulgrew et al., 2019; Mulgrew et al., 2018).

Limitations of our studies should also be noted. While the IPAQ is a valid and widely used measure of physical activity (Silsbury et al., 2015), it is a self-report instrument and has inherent social desirability bias resulting in general overreporting of behaviors (Lee et al., 2011). The adoption of device-based assessments of physical activity (e.g., actigraphy), which are less susceptible to such biases, could be a useful addition to future studies. Further, we did not collect data on ethnicity in study 1, and the women who took part in our studies were generally young and thus our results cannot be generalized to other groups of women. Finally, due to stringent requirements by the institutional ethics board, we did not produce a cover story to disguise the true purpose of the studies to the participants. This could have primed the participants to respond in a particular way.

6. Conclusion

Our experimental evidence revealed that repeated exposure to TGC media images/videos confers benefits for body appreciation and self-compassion, controlling for age and BMI. Further, exposure to TGC did not increase physical activity even though the campaign was designed to promote physical activity, and autonomous motivation did not mediate the effects of TGC on physical activity behavior. Given the complexity of physical activity behavior, it is likely that

multi-component interventions (of which TGC may be only one component) are needed to change physical activity behavior. In conclusion, repeated exposure to the TGC campaign can improve important facets of positive body image.

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CRediT authorship contribution statement

Cecilie Thøgersen-Ntoumani: Conceptualization, Methodology, Supervision, Formal analysis, Writing – original draft. **Jayde Litster**: Conceptualization, Investigation. **Rachel Del Casale**: Conceptualization, Investigation. **Andreas Stenling**: Formal analysis, Writing – review & editing.

Data Availability

Anonymized data may be made available from the first author upon reasonable request.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.bodyim.2022.06.001.

References

- Abbott, B. D., & Barber, B. L. (2010). Embodied image: Gender differences in functional and aesthetic body image among Australian adolescents. *Body Image*, 7, 22–31. <https://doi.org/10.1016/j.bodyim.2009.10.004>
- Abioye, I. A., Hajifathalian, K., & Danaei, G. (2013). Do mass media campaigns improve physical activity? A systematic review and meta-analysis. *Archives of Public Health*, 71, 20. <https://doi.org/10.1186/0778-7367-71-20>
- Alleva, J. M., Sheeran, P., Webb, T. L., Martijn, C., & Miles, E. (2015). A meta-analytic review of stand-alone interventions to improve body image. *PlosOne*, 10, Article e0139177. <https://doi.org/10.1371/journal.pone.0139177>
- Alleva, J. M., & Tylka, T. L. (2021). Body functionality: A review of the literature. *Body Image*, 36, 149–171. <https://doi.org/10.1016/j.bodyim.2020.11.006>
- Alleva, J. M., Tylka, T. L., & Kroon Van Diest, A. M. (2017). The Functionality Appreciation Scale (FAS): Development and psychometric evaluation in US community women and men (<http://dx.doi.org/>) *Body Image*, 23, 28–44. <https://doi.org/10.1016/j.bodyim.2017.07.008>
- Andrew, R., Tiggemann, M., & Clark, L. (2016). Predictors and health-related outcomes of positive body image in adolescent girls: A prospective study. *Developmental Psychology*, 52(3), 463–474. <https://doi.org/10.1037/dev0000095>
- Augustus-Horvath, C. L., & Tylka, T. L. (2011). The acceptance model of intuitive eating: A comparison of women in emerging adulthood, early adulthood, and middle adulthood. *Journal of Counseling Psychology*, 58(1), 110–125. <https://doi.org/10.1037/a0022129>
- Baguley, T. (2009). Standardized or simple effect size: What should be reported? *British Journal of Psychology*, 100(3), 603–617. <https://doi.org/10.1348/000712608x377117>
- Boszik, F., Whisenhunt, B. L., Hudson, D. L., Bennett, B., & Lundgren, J. D. (2018). Thin is in? Think again: The rising importance of muscularity in the thin ideal female body. *Sex Roles*, 79(9), 609–615. <https://doi.org/10.1007/s11199-017-0886-0>
- Braun, T. D., Park, C. L., & Gorin, A. (2016). Self-compassion, body image, and disordered eating: A review of the literature. *Body Image*, 17(1), 117–131. <https://doi.org/10.1016/j.bodyim.2016.03.003>
- Byrne, N. M., Hills, A. P., Hunter, G. R., Weinsier, R. L., & Shutz, Y. (2005). Metabolic equivalent: One size does not fit all. *Journal of Applied Physiology*, 99(3), 1112–1119. <https://doi.org/10.1152/jappphysiol.00023.2004>
- Cohen, R., Irwin, L., Newton-John, T., & Slater, A. (2019). #bodypositivity: A content analysis of body positive accounts on Instagram. *Body Image*, 29(1), 47–57. <https://doi.org/10.1016/j.bodyim.2019.02.007>
- Costa, R., Probst, M., Bastos, T., Vilhena, E., Seabra, A., & Corredeira, R. (2018). Behavioural regulation in exercise questionnaire in people with schizophrenia:

- Construct validity of the portuguese versions. *Disability and Rehabilitation*, 40(21), 2577–2585. <https://doi.org/10.1080/09638288.2017.1342277>
- Craig, C. L., Marshall, A. L., Sjostrom, M., Bauman, A., Booth, M. L., Ainsworth, B. E., ... Oja, P. (2003). International physical activity questionnaire: 12-country reliability and validity. *Medicine and Science in Sports and Exercise*, 35, 1381–1395. <https://doi.org/10.1249/01.MSS.0000078924.61453.FB>
- Enders, C. K. (2010). *Applied missing data analysis*. Guilford Press.
- Farquhar, J. C., & Wasylykiw, L. (2007). Media images of men: Trends and consequences of body conceptualization. *Psychology of Men & Masculinity*, 8(3), 145. <https://doi.org/10.1037/1524-9220.8.3.145>
- Franzoi, S. L. (1995). The body-as-object versus the body-as-process: Gender differences and gender considerations. *Sex Roles*, 33(5), 417–437.
- Gilbert, P. (2010). *Compassion focused therapy: Distinctive features*. New York, NY: Routledge.
- Guthold, R., Stevens, G. A., Riley, L. M., & Bull, F. C. (2018). Worldwide trends in insufficient physical activity from 2001 to 2016: A pooled analysis of 358 population-based surveys with 1.9 million participants. *The Lancet Global Health*, 6(10), e1077–e1086. [https://doi.org/10.1016/S2214-109X\(18\)30357-7](https://doi.org/10.1016/S2214-109X(18)30357-7)
- Hancock, G. R., & An, J. (2020). A closed-form alternative for estimating ω reliability under unidimensionality. *Measurement: Interdisciplinary Research and Perspectives*, 18(1), 1–14. <https://doi.org/10.1080/15366367.2019.1656049>
- Hayes, A. F., & Rockwood, N. J. (2017). Regression-based statistical mediation and moderation analysis in clinical research: Observations, recommendations, and implementation. *Behaviour Research and Therapy*, 98, 39–57. <https://doi.org/10.1016/j.brat.2016.11.001>
- He, J., Sun, S., Lin, Z., & Fan, X. (2020). The association between body appreciation and body mass index among males and females: A meta-analysis. *Body Image*, 34, 10–26. <https://doi.org/10.1016/j.bodyim.2020.03.006>
- Knobloch-Westerwick, S., & Crane, J. (2012). A losing battle: Effects of prolonged exposure to thin-ideal images on dieting and body satisfaction. *Communication Research*, 39(1), 79–102. <https://doi.org/10.1177/0093650211400596>
- Leavy, J. E., Bull, F. C., Rosenberg, M., & Bauman, A. (2011). Physical activity mass media campaigns and their evaluation: A systematic review of the literature 2003–2010. *Health Education Research*, 26, 1060–1085. <https://doi.org/10.1093/her/cyr069>
- Lee, P. H., Macfarlane, D. J., Lam, T., & Stuart, S. M. (2011). Validity of the international physical activity questionnaire short form (IPAQ-SF): A systematic review. *International Journal of Behavioural Nutrition and Physical Activity*, 8, 115. <https://doi.org/10.1186/1479-5868-8-115>
- Linardon, J., Tylka, T. L., & Fuller-Tyszkiewicz, M. (2021). Intuitive eating and its psychological correlates: A meta-analysis. *International Journal of Eating Disorders*. <https://doi.org/10.1002/eat.23509>
- Markland, D., & Tobin, V. (2004). A modification to the behavioural regulation in exercise questionnaire to include an assessment of amotivation. *Journal of Sport and Exercise Psychology*, 26, 191–196. <https://doi.org/10.1123/jsep.26.2.191>
- Marsh, H. W. (2007). Application of confirmatory factor analysis and structural equation modeling in sport and exercise psychology. In G. Tenenbaum, & R. C. Eklund (Vol. Eds.), (third ed.). *Handbook of sport psychology*: 3, (pp. 774–798). Hoboken, NJ: Wiley.
- McEachan, R. R. C., Conner, M., Taylor, N. J., & Lawton, R. J. (2011). Prospective prediction of health-related behaviours with the theory of planned behaviour: A meta-analysis. *Health Psychology Review*, 5, 97–144. <https://doi.org/10.1080/17437199.2010.521684>
- Michie, S., van Stralen, M. M., & West, R. (2011). The behaviour change wheel: A new method for characterising and designing behaviour change interventions. *Implementation Science*, 6, 42. <https://doi.org/10.1186/1748-5908-6-42>
- Mulgrew, K. E., & Hennes, S. M. (2015). The effect of functionality- and aesthetic-focused images on Australian women's body satisfaction. *Sex Roles*, 72(3–4), 127–139. <https://doi.org/10.1007/s11199-014-0440-2>
- Mulgrew, K. E., McCulloch, K., Farren, E., Prichard, I., & Lim, M. S. (2018). This girl can #jointhemovement: Effectiveness of physical functionality-focused campaigns for women's body satisfaction and exercise intent. *Body Image*, 24(1), 26–35. <https://doi.org/10.1016/j.bodyim.2017.11.007>
- Mulgrew, K. E., Prichard, I., Stalley, N., & Lim, M. S. (2019). Effectiveness of a multi-session positive self, appearance, and functionality program on women's body satisfaction and response to media. *Body Image*, 31(1), 102–111. <https://doi.org/10.1016/j.bodyim.2019.08.012>
- Mulgrew, K. E., Schulz, K., Norton, O., & Tiggemann, M. (2020). The effect of thin and average-sized models on women's appearance and functionality satisfaction: Does pose matter? *Body Image*, 32(3), 128–135. <https://doi.org/10.1016/j.bodyim.2019.12.004>
- Mulgrew, K. E., & Tiggemann, M. (2018). Form or function: Does focusing on body functionality protect women from body dissatisfaction when viewing media images? *Journal of Health Psychology*, 23(1), 84–94. <https://doi.org/10.1177/1359105316655471>
- Murn, L. T., & Steele, M. R. (2020). What matters most? Age and gender differences in self-compassion and body attitudes among college students. *Counselling Psychology Quarterly*, 33(4), 541–560. <https://doi.org/10.1080/09515070.2019.1605334>
- Muthén, L. K., & Muthén, B. O. (1998). *Mplus User's Guide* (Eight ed.). Los Angeles, CA: Muthén & Muthén.
- Neff, K. D. (2015). The self-compassion scale is a valid and theoretically coherent measure of self-compassion. *Mindfulness*, 7(1), 264–274. <https://doi.org/10.1007/s12671-015-0479-3>
- Neff, K. D., & Germer, C. K. (2013). A pilot study and randomized controlled trial of the mindful self-compassion program. *Journal of Clinical Psychology*, 6, 28–44.
- Ntoumanis, N., Ng, J. Y., Prestwich, A., Quested, E., Hancox, J. E., Thøgersen-Ntoumani, C., & Williams, G. C. (2021). A meta-analysis of self-determination theory-informed intervention studies in the health domain: Effects on motivation, health behavior, physical, and psychological health. *Health Psychology Review*, 15(2), 214–244. <https://doi.org/10.1080/17437199.2020.1718529>
- Ogden, J., Gosling, C., Hazelwood, M., & Atkins, E. (2020). Exposure to body diversity images as a buffer against the thin-ideal: An experimental study. *Psychology, Health & Medicine*, 2(1), 1–14. <https://doi.org/10.1080/13548506.2020.1734219>
- Phillips, W. J., & Hine, D. W. (2021). Self-compassion, physical health, and health behaviour: a meta-analysis. *Health Psychology Review*, 15, 113–139. <https://doi.org/10.1080/17437199.2019.1705872>
- Piran, N. (2002). Embodiment: A mosaic of inquiries in the area of body weight and shape preoccupation. In S. Abbey (Ed.), *Ways of knowing in and through the body: Diverse perspectives on embodiment* (pp. 211–214). Soleil Publishing.
- Piran, N. (2015). New possibilities in the prevention of eating disorders: The introduction of positive body image measures. *Body Image*, 14, 146–157. <https://doi.org/10.1016/j.bodyim.2015.03.008>
- Piran, N. (2016). Embodied possibilities and disruptions: The emergence of the experience of embodiment construct from qualitative studies with girls and women. *Body Image*, 18, 43–60. <https://doi.org/10.1016/j.bodyim.2016.04.007>
- Prichard, I., McLachlan, A. C., Lavis, T., & Tiggemann, M. (2018). The impact of different forms of #fitspiration imagery on body image, mood, and self-objectification among young women. *Sex Roles*, 78(11), 789–798. <https://doi.org/10.1007/s11199-017-0830-3>
- Raes, F., Pommier, E., Neff, K. D., & Van Gucht, D. (2011). Construction and factorial validation of a short form of the self-compassion scale. *Clinical Psychology and Psychotherapy*, 18(3), 250–255. <https://doi.org/10.1002/c>
- Rhodes, R. E., & deBruin, G.-J. (2013). How big is the physical activity intention – behaviour gap? A meta-analysis using the action control framework. *British Journal of Health Psychology*, 18, 296–309. <https://doi.org/10.1111/bjhp.12032>
- Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. New York: Guilford Publishing.
- Sabiston, C. M., Pila, E., Vani, M., & Thøgersen-Ntoumani, C. (2019). Body image, physical activity, and sport: A scoping review. *Psychology of Sport and Exercise*, 42, 48–57. <https://doi.org/10.1016/j.psychsport.2018.12.010>
- Silsbury, Z., Goldsmith, R., & Rushton, A. (2015). Systematic review of the measurement properties of self-report physical activity questionnaires in healthy adult populations. *BMJ Open*, 5, Article e008430. <https://doi.org/10.1136/bmjopen-2015-008430>
- Sirois, F. M., Kitner, R., & Hirsch, J. K. (2015). Self-compassion, affect, and health-promoting behaviors. *Health Psychology*, 34(6), 661–669. <https://doi.org/10.1037/hea0000158>
- Slater, A., & Tiggemann, M. (2015). Media exposure, extracurricular activities, and appearance-related comments as predictors of female adolescents' self-objectification. *Psychology of Women Quarterly*, 39(3), 375–389. <https://doi.org/10.1177/0361684314554606>
- Sport England (2015). This Girl Can. Retrieved from: (<https://www.sportengland.org/campaigns-and-our-work/this-girl-can>).
- Sport England (2016). This Girl Can delivers results one year on. Retrieved from: (<https://www.sportengland.org/news/thisgirlcanbirthday>).
- Terry, M. L., & Leary, M. R. (2011). Self-compassion, self-regulation, and health. *Self and Identity*, 10(3), 352–362. <https://doi.org/10.1080/15298868.2011.558404>
- Tiggemann, M., & McCourt, A. (2013). Body appreciation in adult women: Relationships with age and body satisfaction. *Body Image*, 10, 624–627. <https://doi.org/10.1016/j.bodyim.2013.07.003>
- Tiggemann, M., & Zaccardo, M. (2015). Exercise to be fit, not skinny": The effect of fitspiration imagery on women's body image. *Body Image*, 15, 61–67. <https://doi.org/10.1016/j.bodyim.2015.06.003>
- Tylka, T. L. (2012). Positive psychology perspectives on body image. *Encyclopedia of Body Image and Human Appearance*, 3(2), 657–663. <https://doi.org/10.1016/b978-0-12-384925-0.00104-8>
- Tylka, T. L., & Wood-Barcalow, N. L. (2015aa). What is and what is not positive body image? Conceptual foundations and construct definition. *Body Image*, 14(1), 118–129. <https://doi.org/10.1016/j.bodyim.2015.04.001>
- Tylka, T. L., & Wood-Barcalow, N. L. (2015bbb). 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>
- VicHealth (2018). This Girl Can – Victoria. Retrieved from: (<https://thisgirlcan.com.au/about-us/>).
- Wasylykiw, L., & Butler, N. A. (2014). Body talk among undergraduate women: Why conversations about exercise and weight loss differentially predict body appreciation (<http://dx.doi.org/>) *Journal of Health Psychology*, 19, 1013–1024. <https://doi.org/10.1177/1359105313483154>
- Williamson, G., & Karaszka, B. T. (2018). The effect of functionality-focused and appearance-focused images of models of mixed body sizes on women's state-oriented body appreciation. *Body Image*, 24, 95–101. <https://doi.org/10.1016/j.bodyim.2017.12.008>
- Wong, M. Y. C., Chung, P. K., & Leung, K. M. (2021). The relationship between physical activity and self-compassion: A systematic review and meta-analysis. *Mindfulness*, 12, 547–563. <https://doi.org/10.1007/s12671-020-01513-4>
- Zamarrilla, J., Castillo, I., Baños, R., Delgado, M., & Álvarez, O. (2018). Motivational regulations across the stages of change for exercise in the general population of Monterrey (Mexico). *Movement Science and Psychology*, 3(9), 2368. <https://doi.org/10.3389/fpsyg.2018.02368>