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Ross C. Hollett
Edith Cowan University

Melanie Challis
Edith Cowan University

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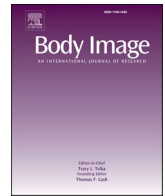


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Experimental evidence that browsing for activewear lowers explicit body image attitudes and implicit self-esteem in women

Ross C. Hollett^{*}, Melanie Challis

Psychology and Criminology, Edith Cowan University, Joondalup, Western Australia, Australia

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ABSTRACT

Online apparel shopping is popular amongst women and offers salient visual information for making body image and self-worth judgements. Apparel segments which emphasize the value of women's bodies are particularly effective for eliciting low body image and self-worth. Across two studies, we investigated the association between self-reported and experimental online activewear exposure on women's self-worth, body image, appearance attitudes, mood and gaze behavior. In Study 1, participants ($N = 399$) completed a survey collecting their online apparel shopping habits, body appreciation, self-esteem, appearance comparison tendencies and self-objectification attitudes. Activewear was the second-most popular apparel segment amongst women (after casualwear) and weekly activewear browse time was positively correlated with appearance comparison tendencies, desires to be muscular/athletic and body shame. In Study 2, participants ($N = 126$) were randomly allocated to browse an activewear, casualwear or homewares website and completed pre and post measures of mood, body image, implicit self-esteem and body gaze behavior. In the activewear condition, there was a significant reduction in positive body image and implicit self-esteem scores. There were no experimental effects for body gaze behavior. These findings illustrate that apparel choices have value for understanding the aetiology of maladaptive body image attitudes and low self-esteem in women.

1. Introduction

Online apparel shopping is extremely popular amongst women, with US sales data suggesting that the online womenswear market (\$187 billion) is worth substantially more than the online menswear market (\$86 billion) (Ward, 2021). Apparel retail imagery is typically promoted using models who possess idealized bodily features, which can put consumers at risk of feeling dissatisfied with their own body image (Brice et al., 2022; Brown & Tiggemann, 2016; Pounders, 2018). Importantly, there has been substantial sales growth in activewear, a style of clothing particularly effective at highlighting bodily features through form-fitting and revealing designs (Horton et al., 2016). Activewear falls within the broad segment of “athleisure”, or clothing designed for both exercise and casual use (Lipson et al., 2020). While activewear is often intended to promote positive physical transformation, it may also facilitate relative comparison among women because differences between, or changes in, physique are more evident (Brice et al., 2022; Luna Mora & Berry, 2021). Given that women invest considerable time online shopping for clothing, including for

activewear, research is needed to understand the potential risks of apparel website exposure on women's body image and self-worth. While a small body of research suggests that online apparel shopping is linked with mood and negative body image attitudes, the influence that exposure to specific clothing categories may have on women's wellbeing is not well understood (Hollett, Panaia, & Smart, 2023; Kim & Damhorst, 2010; Lee & Johnson, 2012). Research designed to explore the potential risks of apparel shopping on psychosocial wellbeing is valuable for improving the consumer experience and supporting further reform in the apparel e-commerce industry. Consequently, the present study aimed to determine which clothing segments are browsed most often by women and whether exposure to online shopping is associated with body image and appearance attitudes, self-worth, mood, and body gaze behavior using both correlational and experimental designs.

2. Online apparel imagery and appearance comparisons

Womenswear is a fiercely contended retail market with brands using a variety of strategies to secure the attention of potential consumers

^{*} Correspondence to: 270 Joondalup Drive, Joondalup, Western Australia, Australia.
E-mail address: r.hollett@ecu.edu.au (R.C. Hollett).

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(Burns et al., 2016). In online retail contexts, a common marketing strategy is to create imagery highlighting the bodies of women (e.g., breasts, waist, legs, buttocks) which has long been assumed to reliably secure both male and female attention (Black & Morton, 2017; Liu et al., 2009). Activewear is a category of clothing which heavily utilises body-focused marketing to showcase the key features of the segment, which tends to be tight, form-fitting or revealing (Horton et al., 2016; Zhou, 2018). While activewear is generally designed for exercise, it is increasingly being worn by women in casual contexts and is thus becoming a growing component of women's wardrobes (Brice et al., 2022; O'Sullivan et al., 2017; Watts & Chi, 2019). Given that activewear sales are predicted to be worth 547 billion globally by 2024 (Bringé, 2021), it is reasonable to assume that the body-focused marketing employed by activewear brands is effectively capturing the attention of female consumers. Another major contributor to the popularity of activewear is the growth of the "fitspiration" trend, often characterized by user-generated social media content intended to inspire fitness (Deighton-Smith & Bell, 2018; Lipson et al., 2020). Fitspiration imagery often involves muscular and toned women clothed in activewear (Brice et al., 2022; Tiggemann & Zaccardo, 2015) promoting a culture which values physique while also increasing threats to body image. Indeed, correlational and experimental research points to fitspiration-related media content as contributing to negative affect and lower body satisfaction among women (Griffiths & Stefanovski, 2019; Tiggemann & Zaccardo, 2015).

One reason why female consumers might be attentively susceptible to body-focused apparel imagery is because women are vulnerable to media messages which threaten body image (Myers & Crowther, 2009). Activewear retail imagery is threatening to body image because it invites women to compare their appearance to models wearing garments that showcase their athletic and/or toned physiques. Appearance comparison is a form of social comparison, whereby a person makes relative judgements about their physical characteristics against others (Schaefer & Thompson, 2014). Research suggests that women are particularly susceptible to appearance comparisons that involve upward evaluations, despite these being potentially harmful to their self-worth (Myers & Crowther, 2009). Specifically, exposure to female models who possess idealized bodies (e.g., small waist-to-hip ratios, toned muscles) can heighten the perceived distance between one's own appearance and an acceptable standard (Homan et al., 2012; Kleemans et al., 2018). Such discrepancies can lead to feelings of inadequacy and negative mood which can translate into potential clinical disturbances (e.g., disordered eating) if not regulated or resolved (Holland & Tiggemann, 2016; Leahy et al., 2007). Indeed, preliminary experimental evidence in a sample of 113 women found that they felt worse about their looks when exposed to an activewear website, compared to casualwear website exposure and appearance comparison tendencies correlated positively with self-reported online shopping behavior (Hollett, Panaia, & Smart, 2023). Given that activewear is argued to encourage the surveillance of women's bodies (Lipson et al., 2020; Luna Mora & Berry, 2021), likely to a greater degree than casualwear imagery, we assume that exposure to activewear websites could prime strong body gaze preferences and subsequent self-objectification.

2.1. Self-objectification and body gaze behavior

Self-objectification is another important socio-cognitive process for explaining why women may experience inadequacy and negative mood due to observations of other women's bodies in the media. Self-objectification involves adopting a viewpoint that one's value is largely determined by one's body parts (Fredrickson & Roberts, 1997). This viewpoint is derived from objectification theory which explains that, in societies whereby the value of people's physical features are readily promoted, a culture may develop which involves undervaluing social, emotional and intellectual qualities when judging others (Fredrickson & Roberts, 1997; Hollett et al., 2022). If women adopt these

objectifying attitudes, then they are expected to engage in increased body surveillance and potentially experience subsequent body shame because they are prioritising their bodies over other important attributes when determining their own self-worth (Moradi & Varnes, 2017).

Increased surveillance of one's own body is considered a key marker of self-objectification, but it is also plausible that the surveillance of others' bodies also serves to sustain self-objectification (Loughnan & Pacilli, 2014; Moradi & Varnes, 2017). Indeed, evidence suggests that body-biased gaze behavior is an important marker of objectification in both men and women (Hollett et al., 2022). That is, gaze patterns which prioritise attention towards bodies over faces when attending to visual stimuli of human models may reinforce viewpoints that bodies are disproportionately important when making judgments about others and the self (Bartky, 1990; Holland & Haslam, 2013). While women generally show a natural tendency to gaze at faces, they are susceptible to increased body gaze behavior during and after exposure to media imagery of sexually objectified women (Hewig et al., 2008; Nummenmaa et al., 2012). For instance, women have shown body gaze preferences during exposure to sexualized female video characters and when primed with a sexually objectifying music video (Hollett et al., 2019; Karsay & Matthes, 2016). Importantly, increased body gaze towards idealized women in fashion advertisements is linked with higher appearance comparisons and lower body satisfaction in women (Tiggemann et al., 2019). Therefore, repeated exposure to body-focused apparel imagery may be capable of habituating gaze patterns which are body-focused. Given that body gaze behavior has been positively correlated with demeaning attitudes towards women (Bareket et al., 2018; Hollett et al., 2022), it is important to explore the possibility that women's gaze towards other women's bodies may play a role in perpetuating self-objectification attitudes.

Media imagery that emphasizes women's bodies through cropping, revealing clothing and sexualized posture has been widely blamed for perpetuating a sexually objectifying culture which undermines the value, and jeopardizes the wellbeing, of women (Behm-Morawitz, 2017; Downs & Smith, 2010; Karsay et al., 2017; Karsay & Matthes, 2016; Tylka & Kroon Van Diest, 2014). Research on media imagery has repeatedly supported these assumptions by linking social media and fashion imagery exposure in women to lower mood, self-esteem, body dissatisfaction, and disordered eating (Brown & Tiggemann, 2016; Homan et al., 2012; Levine & Murnen, 2009; Prichard et al., 2018). However, online apparel shopping offers some unique characteristics when compared to more generic forms of idealized imagery exposure (e.g., social media). Specifically, online apparel shopping represents an often-necessary activity to access affordable and fashionable clothing. Browsing can be done at convenience and not bound by the same time and practical costs associated with in-store shopping (Shukla et al., 2022). That is, shopping online can be done more frequently and for longer. Despite the benefits of online apparel shopping over traditional bricks-and-mortar stores, it carries greater risks to body image because the garments are displayed to consumers using attractive models, rather than simply being hung on racks (Kim & Damhorst, 2010). Instead of selecting potential items and trying them on using a reflection in a mirror to judge fit and comfort, the consumer must visually evaluate the garment they want for themselves by assessing how it looks on another, often idealistic woman (Lee & Johnson, 2012). That is, online shopping for clothing initiates a cognitive process whereby consumers deliberately simulate themselves in various outfits using the models as their mirror (Hollett, Panaia, & Smart, 2023). As such, we argue that the online shopping experience might be particularly harmful (relative to other forms of idealized imagery exposure) to women's body image and subsequent self-worth through highly salient (and largely upward) appearance comparisons. Further, shopping for apparel segments which are marketed with a high proportion of body-focused imagery, such as activewear, may be most harmful to women's body image and subsequent self-worth because they facilitate self-objectification, possibly via eliciting increased body gaze behavior towards other women. While

upward appearance comparisons and self-objectification offer some explanations for potential adverse effects of online apparel shopping on women's body image, it is also important to determine the extent to which these effects can be linked to the broader consequence of low self-worth.

2.2. Body image and self-worth

If repeated exposure to activewear imagery on apparel websites threatens women's body image, this may translate to lower perceptions of overall self-worth. Substantial evidence supports the assumption that women's general self-concept is closely tied to their physical appearance (Adams et al., 2017; Moya-Garófano & Moya, 2019; Veldhuis et al., 2020). Correlations between body image attitudes and self-esteem, even without disattenuation for imperfect reliability, estimate that between 30% and 60% of the variance in self-esteem can be accounted for by body image attitudes (Hollett, Panaia, & Smart, 2023; Schaefer & Thompson, 2014; Tylka & Wood-Barcalow, 2015; Veldhuis, Alleva, Bij de Vaate, Keijer, & Konijn, 2020). One mechanism by which body image and self-worth are potentially linked is the accumulation of reduced positive affect or increased negative affect each time a person's body image is threatened. For instance, there is evidence that experimental exposure to athletic and toned models increases both negative mood and body dissatisfaction in women (Garvin & Damson, 2008; Prichard et al., 2018), and increased negative affect (e.g., body shame) has been consistently correlated with low self-esteem (Moradi & Huang, 2008). Furthermore, longitudinal data in adolescents shows that body dissatisfaction predicts both negative mood and low self-esteem (Paxton et al., 2006). Importantly, positive body image or "body appreciation" may offer protection against appearance ideals promoted in the media due to its links with enhanced psychological wellbeing (Avalos et al., 2005). Attitudes which reflect a higher respect and acceptance of one's body are argued to be an important complement to measuring negative body image attitudes (e.g., shame and dissatisfaction) when attempting to understand the potential impact of image exposure on women's wellbeing (Tylka & Wood-Barcalow, 2015). For example, women with higher body appreciation may be less likely to engage in online apparel shopping, thus reducing the likelihood their self-worth may be threatened. Given the associations between body dissatisfaction, body appreciation, mood and self-esteem, experimentally and longitudinally, it is plausible that online apparel shopping is one activity that could contribute to low self-esteem by regularly threatening body image and eliciting negative affect.

Importantly, shopping behavior in women has been linked to increases in positive mood and decreases in negative mood suggesting that it may be a useful strategy for regulating affect (Rick et al., 2014; Son & Lee, 2021). If women develop a habit of shopping to regulate their mood, it is plausible that this strategy might be imprudently extended to products which have adverse effects on mood. For example, shopping for homewares or technology would presumably present little to no threat to body image, whereas shopping for clothing presents a much higher risk of body image threat. Given that mood may play an important motivation role when online shopping, but also explain links between body image and self-worth, it is important to measure for potential fluctuations in mood when exploring the effects of online shopping for apparel. However, the short- and long- term effects of shopping for activewear on body image, mood and self-worth, are yet to be investigated. Therefore, research is needed to determine whether online shopping for specific clothing styles threatens body image and low self-worth, possibly as a function of upward appearance comparisons and self-objectification.

2.3. The present study

Given the popularity of online shopping and substantial growth in body-focused segments such as activewear in women, we designed a

study to examine the effects of online shopping exposure on body image and self-worth. We used a combination of correlational and experimental designs, as well as self-report, implicit and attentional measurement techniques to estimate short- and long-term effects of online shopping exposure. Our multi-study design utilized an online administration of self-report measures for correlational analysis, followed by laboratory sessions to administer a short-term website exposure and measure self-report, implicit attitudes, and gaze behavior for experimental analysis.

In Study 1, we aimed to determine which clothing segments were browsed most often by women and to explore associations between self-reported website exposure and body image, self-objectification, and self-worth attitudes. Significant correlations would support assumptions that exposure to online apparel shopping may adversely affect women's mental wellbeing. However, such associations would also support the possibility that poor mental wellbeing (e.g., low self-worth) might also motivate increased online shopping as a strategy to regulate one's affect. In Study 2, we aimed to determine, experimentally, the impact of online shopping for specific apparel segments on body image attitudes, implicit self-worth and body gaze behavior. Significant reductions in state body image and implicit self-worth in the casualwear and activewear conditions would support assumptions that upward appearance comparisons during online shopping for clothing threaten body image and self-esteem. Stronger reductions in state body image and implicit self-worth, and increases in body gaze behavior, in the activewear condition would support assumptions that body-focused imagery encourages objectifying gaze patterns and are particularly harmful to body image and self-esteem. Note that across our correlational analyses, we opted to control for age due to our wide participant age range and evidence that social comparison behaviors reduce with increasing age (Yu et al., 2013). This allowed us to make interpretations irrespective of the potentially complex role of age. However, we have also included zero-order correlations for Study 1 in the supplementary materials.

2.4. Study 1 hypotheses

In line with research suggesting that apparel shopping is linked to mood and appearance attitudes (Hollett, Panaia, & Smart, 2023; Son & Lee, 2021; Tiggemann & Lacey, 2009), several hypotheses were developed for Study 1. Hypotheses (H5-H9) for Study 2 will be presented following the results of Study 1.

H1. In Study 1, casualwear was expected to be the most popular apparel category browsed by women, with activewear expected to also be high in popularity, relative to the other categories (corporate wear, workwear, loungewear, swimwear, underwear, sleepwear, and special occasion wear).

H2. In Study 1, total self-reported online apparel shopping was expected to correlate negatively with (2a) body appreciation and (2b) self-esteem, after controlling for age.

H3. In Study 1, total self-reported online apparel shopping was expected to correlate positively with (3a) appearance attitudes (schemas, desires to be thin/low fat/athletic/muscular), (3b) appearance comparison tendencies, and (3c) self-objectification (body surveillance and shame), after controlling for age.

H4. For both H2 and H3, it was expected that the correlations would be larger for activewear shopping time due to stronger self-objectification effects when exposed to this type of apparel.

3. Study 1

3.1. Method

3.1.1. Participants

Self-reported female participants ($n = 399$) were recruited from the

university and surrounding community and were aged between 18 and 70 years old ($M = 29.95$, $SD = 10.02$). Most participants (98.7%) reported browsing for clothing online previously and 81.2% reported doing so in the last month. Of the participants who browsed for clothing in the last month, they spent an average of 96.06 min ($Mdn = 45$, $SD = 112.04$) per week doing so. Most participants reported being Caucasian (79.9%), following by Asian (6.8%), African (3%) Aboriginal (1%), or mixed/other (9.3%). Of participants who provided their height and weight (90.5%), the average body mass index (BMI) was 26.07 ($SD = 6.41$).

3.1.2. Measures

3.1.2.1. Online apparel shopping habits. Participants were asked to estimate how many days a week (1–7 days) and for how long on a typical day (ranging from 15 min to 8 h) they had browsed for women's clothing online in the last month. These two responses were multiplied to estimate weekly apparel shopping time in minutes. Following these ratings, participants were asked to estimate how much of their browsing time was spent across nine clothing categories (activewear, corporate wear, workwear, casualwear, loungewear, swimwear, underwear, sleepwear, and special occasion wear) expressed as a percentage out of 100. These categories were informed by menu options on several womenswear apparel websites. Activewear was defined for participants as “suitable for sport/gym, though also worn casually”. Participants also had the option to specify an “other” category for clothing which did not fit within the provided categories. The percentages were then multiplied by the overall weekly browsing time to estimate the time spent browsing each category.

3.1.2.2. Self-esteem. The 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1965) measured trait self-esteem by capturing positive and negative feelings about the self. Participants rated the items from 1 (*strongly disagree*) to 4 (*strongly agree*). Composite scores were created by summing the item ratings (range 10–40). Cronbach's alpha in this study was .90.

3.1.2.3. Body appreciation scale. The 10-item revised Body Appreciation Scale (BAS-2) (Tylka & Wood-Barcalow, 2015) measured the extent to which a person appreciates their own body and is considered a psychometrically sound measure of positive body image. Participants rated the items from 1 (*never*) to 5 (*always*). Composite scores were created by averaging the item ratings. Cronbach's alpha in this study was .95.

3.1.2.4. Appearance schemas. The 20-item Appearance Schemas Inventory Revised (ASI-R) (Cash et al., 2004) measured the perceived importance of personal appearance. Participants rated the items from 1 (*strongly disagree*) to 5 (*strongly agree*). Composite scores were created by summing the item ratings (range 20–100). Cronbach's alpha in this study was .90.

3.1.2.5. Appearance comparisons. The 11-item Physical Appearance Comparison Scale-Revised (PACS-R; Schaefer & Thompson, 2014) measured the tendency to compare one's physical appearance to that of others. Participants rated the items from 0 (*never*) to 4 (*always*). Composite scores were created by averaging the item ratings. Cronbach's alpha in this study was .97.

3.1.2.6. Attitudes towards appearance. The Internalization subscales (10 items) from the Sociocultural Attitudes Towards Appearance Questionnaire 4 (SATAQ-4; Schaefer et al., 2015) measured two components of appearance. Specifically, participants were asked to rate their desire to be thin with low body fat as well as their desire to be muscular/athletic. Participants were asked to rate the items on a 5-point Likert scale anchored from 1 (*definitely disagree*) to 5 (*definitely agree*). Composite

scores were created by averaging the item ratings for each subscale. The internal consistency estimate in the current sample for thin/low fat was .85 and .91 for muscular/athletic.

3.1.2.7. Self-objectification. Two subscales (16 items) from the Objectified Body Consciousness Scale (OBCS; McKinley & Hyde, 1996) measured the extent to which respondents engage in surveillance of their own body and the shame they experience in relation to their body. Participants rated the items from 1 (*strongly disagree*) to 7 (*strongly agree*). Composite scores were created by averaging the item ratings for each subscale. The Cronbach's alpha in this study for surveillance was .87 and .86 for body shame.

3.1.3. Procedure

Participants were invited to complete a 10–15-minute online survey distributed via an undergraduate research participation scheme. Following the measurement of demographic characteristics and online clothing shopping habits, the remaining measures were presented in a randomised order. On completion, participants received course credit. These procedures were approved by the University Human Research Ethics Committee.

3.1.4. Research design and data analysis

Study 1 was correlational with all measures subject to bivariate Pearson correlational analysis (using bootstrapping to estimate significance), whilst controlling for age, to explore associations between self-reported online shopping exposure and the self-worth and appearance measures. Given the high statistical power of the Study 1 sample and the number of correlations, we adopted a threshold of $\alpha = .01$ for significance. According to a power analysis (power = .80) with a sample of 399, the minimum effect size for statistical significance at $\alpha = .05$ was $r = .14$. Descriptive statistics were reported first to characterize women's online shopping preferences and a non-parametric one-way ANOVA was used to determine which clothing categories were most popular amongst women who reported browsing for clothing in the last month.

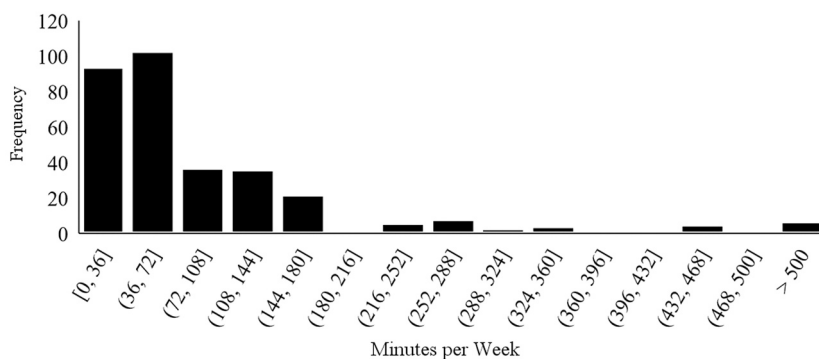
3.2. Results and discussion

3.2.1. Data screening and online shopping habits

Prior to performing any analyses, the data were screened for outliers which fell more than three standard deviations outside of the mean. Consequently, four cases were excluded for recording high overall weekly shopping time. However, skew and kurtosis still fell outside acceptable normal range for the weekly online shopping estimates, so non-parametric analyses were used for comparing browse times between apparel categories and bootstrapping (1000 resamples) was used to estimate significance for the correlational analyses. There were no missing data.

Amongst women who reported browsing for clothing online in the last month ($n = 324$), the weekly minutes spent browsing the separate clothing categories were compared using a Friedman's ANOVA, $\chi^2(9) = 1162.82$, $p < .001$. Non-parametric pairwise comparisons (Wilcoxon rank with Bonferroni corrections) showed that casualwear was the most popular category and was browsed significantly more than each of the other categories ($ps < .001$). Activewear was the second most popular category and was browsed significantly more than each of the other categories, except casualwear ($ps < .05$). Special occasion wear was the third most popular category and was browsed significantly more than each of the other categories, except casualwear, activewear and loungewear ($ps < .01$). Loungewear was the fourth most popular category and was browsed significantly more than each of the other categories, except casualwear, activewear and special occasion wear ($ps < .001$). See Fig. 1 for an illustration of the total browsing time distribution as well as the median and mean weekly browse times across the different categories. These data support the first hypothesis (H1) that activewear

(a) Total weekly minutes browsing histogram



(b) Weekly minutes browsing mean and medians across clothing categories

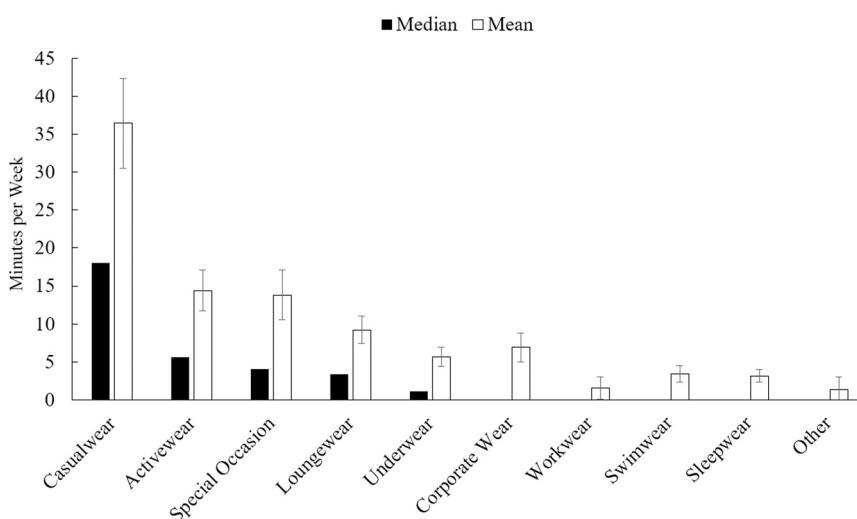


Fig. 1. Histogram of Total Weekly Minutes Browsing (a) and Medians and Means for Weekly Minutes Browsing Across Clothing Categories (b), Means are Accompanied by 95% Confidence Intervals. Note. Categories in panel b are presented in descending order of median weekly minutes browsing. Medians for corporate wear through other were zero.

is one of the most popular apparel segments, second only to casualwear. This finding is consistent with sales data suggesting that activewear is one of the fastest growing apparel segments amongst women (Bringé, 2021; Watts & Chi, 2019). These data also help to estimate the time

women spend browsing for clothes online each week. The self-reported browsing data confirms assumptions that online shopping websites are an important source of visual stimuli which likely contribute to body image judgements about others and the self.

Table 1
Intercorrelations and Descriptive Statistics for Clothing Categories and Self-worth and Appearance Attitudes.

Variables	Total	Clothing Category Browse Time (Mins p/Week)									M	SD
		Casual Wear	Active Wear	Special Wear	Lounge Wear	Under Wear	Corporate Wear	Work Wear	Swim Wear	Sleep Wear		
Self Esteem	-.03	.02	-.06	.06	-.05	-.08	-.03	-.07	-.03	-.10	28.75	5.74
Body Appreciation Scale	-.08	-.05	-.05	-.02	-.04	-.10	-.06	-.04	.00	-.07	3.35	0.86
Appearance Schemas	.24	.22	.17	.08	.11	.12	.16	.00	.14	.15	69.69	12.94
Appearance Comparison	.16	.14	.18	-.01	.06	.07	.10	-.02	.09	.15	2.75	1.16
Thin/Low Fat Desires	.21	.20	.13	.01	.17	.17	.13	-.07	.14	.21	3.18	1.01
Athletic/Muscular Desires	.04	-.01	.27	-.09	-.01	-.05	.05	-.04	.06	.05	2.59	1.05
Body Surveillance	.25	.24	.16	.10	.08	.12	.13	.09	.13	.13	4.50	1.16
Body Shame	.19	.13	.18	.03	.14	.11	.18	.04	.10	.13	3.79	1.33

Note. N = 399; Significant (all $p < .01$) effect sizes in boldface, estimated using bootstrapping; Total reflects browse time across all categories; Age (years) controlled for in all associations.

3.2.2. Correlational analyses

All participants were included in the partial correlational analyses (controlling for age). As can be seen in Table 1, there were no significant correlations between self-esteem or body appreciation and the browse time of any clothing category which meant that the second set of hypotheses (2a and 2b) were not supported. However, there were several modest significant correlations amongst the other variables. Notably, total apparel browse time correlated positively with appearance attitudes, appearance comparison tendencies, thin/low fat desires, body surveillance, and body shame. These data support the third set of hypotheses (3a, 3b, and 3c) that total apparel browse time correlates positively with appearance attitudes, appearance comparisons, and self-objectification. Activewear browse time also correlated positively with appearance attitudes, appearance comparison tendencies and body shame, but also desires to be muscular and athletic. When compared to total apparel browse time using Fisher's Z tests, activewear browse time was more strongly correlated only with athletic/muscular desires ($p < .001$), partially supporting the fourth hypothesis (H4). These data generally further support prior research that clothing preferences might be useful markers of women's body image attitudes and exposure to online apparel imagery may facilitate these attitudes (Hollett, Panaia, & Smart, 2023; Tiggemann & Lacey, 2009). However, we recognise that the significant correlations reported here only reflected mostly small effects, suggesting that associations between clothing preferences and body image attitudes may be diluted by the impact of additional variables and possible measurement error. It may also be the case that the true associations between these variables are also small in size. These modest associations also confirm that experimental research is required to better determine the impact of clothing browsing behavior on body image-related outcomes. As such, Study 2 extends on Study 1 by using an experimental design to test possible causal influences of apparel website exposure on short term changes to body image attitudes, self-worth and gaze behavior.

3.2.3. Study 2 hypotheses

To follow on from the correlational analyses in Study 1, and in line with research suggesting that apparel shopping is linked to mood and appearance attitudes (Hollett, Panaia, & Smart, 2023; Son & Lee, 2021; Tiggemann & Lacey, 2009), and that objectifying imagery of women primes body gaze behavior (Hollett et al., 2019; Karsay et al., 2018), several hypotheses were developed for Study 2:

H5. In Study 2, it was expected that self-reported positive body image would be significantly lower for the clothing shopping conditions at Time 2 compared to Time 1 and compared to the homewares condition at Time 2. However, an interaction effect was expected such that these differences would be largest for the activewear condition.

H6. In Study 2, it was expected that implicit self-esteem would be significantly lower for the clothing shopping conditions at Time 2 compared to Time 1 and compared to the homewares condition at Time 2. However, an interaction effect was expected such that these differences would be largest for the activewear condition.

H7. In Study 2, it was expected that positive mood would be significantly lower for the clothing shopping conditions at Time 2 compared to Time 1 and compared to the homewares condition at Time 2. However, an interaction effect was expected such that these differences would be largest for the activewear condition.

H8. In Study 2, it was expected that negative mood would be significantly higher for the clothing shopping conditions at Time 2 compared to Time 1 and compared to the homewares condition at Time 2. However, an interaction effect was expected such that these differences would be largest for the activewear condition.

H9. In Study 2, it was expected that body gaze scores would be significantly higher for the clothing shopping conditions at Time 2

compared to Time 1 and compared to the homewares condition at Time 2. However, an interaction effect was expected such that these differences would be largest for the activewear condition.

Finally, as an exploratory analysis in Study 2, we examined whether engagement with the products in both the apparel shopping conditions, as measured by dollars spent, would be correlated with any other measures (body image, self-worth, mood and body gaze behavior), after controlling for age.

4. Study 2

4.1. Method

4.1.1. Participants

Self-reported female participants ($n = 126$) were recruited from the university and surrounding community and were aged between 18 and 54 years old ($M = 28.95$, $SD = 8.96$). Most participants (98.4%) reported browsing for clothing online previously and 77% reported doing so in the last month. Of the participants who browsed for clothing in the last month, they spent an average of 95.88 min ($Mdn = 45$, $SD = 120.72$) per week doing so. The total time spent browsing was very similar across Studies 1 and 2. Similar preferences among clothing categories were also observed with casualwear, activewear and special wear emerging as most popular compared to other categories. However, in this sample, there was no significant difference between activewear and special wear weekly browse time ($p = .326$). Most participants reported being Caucasian (69%), following by Asian (11.9%), African (6.3%), Hispanic (1.6%), or mixed/other (11.1%). The average BMI was 25.73 ($SD = 7.42$). The three experimental conditions were equivalent in age ($p = .911$), self-reported time (last month) spent browsing for clothing online ($p = .425$), and BMI ($p = .619$).

4.1.2. Materials

4.1.2.1. Websites. First-page Google results for women's activewear and casualwear brands were screened by the authors. An activewear website, *echt.com.au*, was chosen for the activewear condition, for its predominant use of objectifying (body-focused) female imagery. A casualwear website with a similar target demographic to ECHT, *dotti.com.au*, was chosen for the casualwear condition, for its predominant use of non-objectifying female imagery. A general homewares website, *freedom.com.au* was selected for the non-apparel which sold a selection of furniture and décor. Archived versions of these websites from the approximate time of data collection have been provided in the supplementary materials and on *figshare.com*.

4.1.2.2. Eye tracking. Gaze data was sampled at 30 Hz using a screen-based Tobii eye tracker (X2–30) with up to $.4^\circ$ accuracy and $.32^\circ$ spatial resolution, mounted on a 20-inch LCD screen. Tobii Pro Studio was used to display stimuli and process gaze data. The image set was comprised of fully and partially clothed images of five female subjects obtained from Shutterstock, totalling 10 images, each displayed at 6.6 cm x 25 cm. All the models were ethnically white, aged approximately between 20 and 35 years and could be described as ideal in their body shape (i.e., slender, small waist to hip ratios and attractive) (Gervais et al., 2013). Prior research on this image set confirmed that the female imagery were considered attractive and did not elicit body-gaze among female participants in a non-priming design (Hollett et al., 2022). Facial expressions across the fully and partially clothed images were homogenized where necessary using Photoshop (e.g., see Fig. 2). Image sizes were standardized using head dimensions (2.4 cm x 3.4 cm). Two areas of interest (AOIs) were defined for each subject (head and body). The head AOI included the top of the head, hair, and face to the chin. The body AOI included the entire area below the chin. Fixations were defined as consecutive gaze samples below a $30^\circ/s$ velocity for a

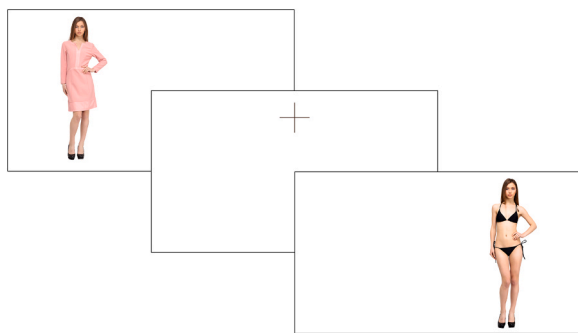


Fig. 2. Example of Female Imagery in the Fully and Partially Clothed Imagery Conditions in the Gaze Task, Respectively.

minimum duration of 100 ms using the Tobii Velocity Threshold Identification (I-VT) filter. Fixations towards each AOI were summed to determine the total duration (in milliseconds) spent fixating separately on the head and body. Similar to recent studies (Bareket et al., 2018; Hollett et al., 2022), we adopted a *relative* body gaze score, whereby head fixation time was subtracted from body fixation time. That is, larger and positive scores reflected greater body-biased gaze behavior.

4.1.2.3. Implicit self-esteem. A combined adaptation of the Self-Esteem Implicit Association Test (Greenwald & Farnham, 2000) and the Brief Implicit Association Task (BIAT; Sriram & Greenwald, 2009) measured implicit self-esteem. The BIAT was programmed and delivered using Millisecond Inquisit 5 Lab (Inquisit, 2018). Participants categorized self (e.g., I, me) or other (e.g., they, them) words with either positive (e.g., smart, loved) or negative (e.g., stupid, hated) words across 4 blocks of 20 trials (preceded by two brief practice blocks). Measures of association strength were computed using D, an effect-size measure with a range of -2 to $+2$ (Greenwald et al., 2003). Higher and positive scores indicate a stronger association between the self and positive words while lower and negative scores indicate a stronger association between the self and negative words. This task was chosen as a state measure to test the experimental hypothesis that exposure to apparel website imagery would prime lower implicit self-esteem. Evidence shows that self-esteem IATs are sensitive to short term manipulations designed to threaten mood or identity (e.g., Gemar, 2001; Greenwald, 2002; Rudman, 2007).

4.1.2.4. Study 2 self-report measures. The Rosenberg Self-esteem Scale, the Body Appreciation scale and the self-reported online shopping behavior questionnaire items were also used in Study 2 (described above). New self-report measures are detailed below.

4.1.2.5. State body image. A single item from the Body Image States Scale (BISS; Cash et al., 2002) was chosen to measure the experimental impact of the website exposure on state body image. Specifically, “Right now I feel.” and participants selected from 1 (*a great deal worse about my looks than I usually feel*) to 9 (*a great deal better about my looks than I usually feel*). This item was chosen as a state measure because it made specific reference to how one usually feels and offered some utility in understanding the impact of the shopping conditions on women’s body image relative to their usual disposition. Single item measures are often used to estimate the effectiveness of short-term experimental manipulations (e.g., Kambouropoulos & Staiger, 2001; Rosenberg, 2009).

4.1.2.6. Positive and negative mood. The 6-item Brief Emotional Experience Scale (BEES; Rogers et al., 2023) measured positive and negative mood before and after the website exposures. The BEES uses the stem, *Right now I am feeling emotionally...* with positive (happy, calm, confident) and negative (worried, sad, afraid) adjectives rated on a 4-point scale from 1 (*not at all*) to 4 (*a lot*). Composite scores were created by averaging the positive and negative adjective ratings separately.

Cronbach’s alpha in this study for the positive and negative items were largely acceptable (.70–.77) across Time 1 and Time 2, with the exception of positive mood at Time 1 ($\alpha = .59$).

4.1.3. Procedure

Participants were invited to a 30–45-minute laboratory session using flyers (print and digital) and an undergraduate research participation scheme. Upon arrival and provision of consent, participants completed the trait self-esteem and body appreciation scales followed by the baseline self-report (BEES and BISS items) and attentional measures (gaze task and implicit self/positive BIAT in counterbalanced order). For each administration of the gaze task, participants were calibrated and informed they would see several images of women. They were asked to look at each image as they would normally look at a person. Images were then presented in a random lateral location to the left or right of the center of the display for four seconds each (see Fig. 2.). Prior to each image, a central fixation cross appeared at the location of the vertical boundary between the head and the body for one second. The images were organized into two different sequences which ensured that participants did not receive the same presentation order at Time 1 and Time 2. That is, a randomized fixed image order was created as well as a reversed order to eliminate any order effects, with the presentation order (Time 1 and Time 2) of these two image sequences counterbalanced for each participant.

Following the Time 1 measurements, participants were randomly allocated to one of the three website exposure conditions. They were directed to freely browse the relevant website while mentally constructing outfits (or room layouts) for 15 min, followed by five minutes to add selections to their shopping cart (without any budgetary restrictions). The subtotal (\$AUD) of the item selections were recorded for each participant as a measure of their engagement with the website stimuli. These subtotals were then converted to Z scores for comparison across the different conditions. There were no significant differences in spending across the conditions ($p = .151$).

To maximize the likelihood of detecting attentional effects, participants completed the Time 2 gaze task and implicit self/positive BIAT (in counterbalanced order) directly after the shopping activity. The Time 2 self-report state measurements (BEES and BISS items) were then presented, followed by the collection of online shopping habits and demographic characteristics. On completion, participants received course credit or a \$20 (AUD) voucher. These procedures were approved by the University Human Research Ethics Committee.

4.1.4. Research design and data analysis

Study 2 employed both experimental and correlational design elements. The study examined both between and within-subjects effects to determine differences between the shopping website exposure conditions and changes from Time 1 and Time 2. Specifically, for examining the experimental effects of the shopping conditions on state body image, implicit self-esteem, mood, and gaze behavior, four repeated measures mixed factorial ANOVAs were used. For state body image and implicit self-esteem, the two ANOVAs included one between-subjects factor (Shopping Condition: casualwear; activewear; homewares) and one within-subjects factor (Time: time 1; time 2). For mood, the ANOVA included one between-subjects factor (Shopping Condition: casualwear; activewear; homewares) and two within-subjects factors; Time (time 1; time 2) and valence (positive; negative). For the gaze scores, the ANOVA included one between-subjects factor (Shopping Condition: casualwear; activewear; homewares) and two within-subjects factors; Time (time 1; time 2) and subject dress (partially; fully). The gaze score represented the mean difference between body and head fixation durations (body fixation duration subtract head fixation duration), such that positive scores indicated a preference for gazing at the subject’s body and negative scores, at the head. Significant main effects and interactions were decomposed with post-hoc tests and Cohen’s d to quantify the magnitude of all pairwise effects. An exploratory analysis involved

performing Pearson correlations (using bootstrapping to estimate significance) between amount spent and the other measures (controlling for age), separately for each shopping condition. A power analysis (power = .80, α = .05) suggested that medium to large effects (f = .25 – .40) for a repeated measures ANOVA with a between-subjects factor would require 60 – 144 participants to achieve significance across our experimental analyses.

4.2. Study 2 results

4.2.1. Data screening

Due to technical issues, poor calibration, and inattentiveness to areas of interest, eleven cases were excluded from eye tracking analyses. Sixteen cases were excluded from BIAT analyses for low average accuracy (< 80%). The data were also screened for outliers which fell more than three standard deviations outside of the mean on each variable. One case was excluded from the mood analyses for an outlying high baseline negative mood. Two further cases were excluded from BIAT analyses for outlying low implicit self-esteem. There were no missing data.

4.2.2. Experimental analyses

4.2.2.1. State body image. To test the hypothesis (H5) that the activewear condition would elicit lower body image ratings compared to the casualwear and homewares conditions, the single item body image scores (feeling better/worse about looks than usual) were compared across conditions from Time 1 to Time 2. There was no main effect of time, $F(1, 123) = .79, p = .38, \eta_p^2 = .01$, or shopping condition, $F(2, 123) = .54, p = .89, \eta_p^2 = .01$, but there was an interaction between time and shopping condition, $F(2, 123) = 5.54, p = .005, \eta_p^2 = .08$. Specifically, there were no differences in body image scores between the shopping conditions at Time 1 or Time 2 (Time 1, $p = .064$; Time 2, $p = .83$), and no changes from Time 1 to Time 2 in body image scores for the casualwear ($p = .523, d = -.10$) or homewares conditions ($p = .077, d = -.28$). However, there was a significant reduction from Time 1 to Time 2 in body image scores for the activewear condition ($p = .027, d = .35$), partly supporting the hypothesis that body image scores would decrease from Time 1 to Time 2 in the apparel shopping conditions. The body image means for each time point and condition have been reported in Table 2.

4.2.2.2. Implicit self-esteem. To test the hypothesis (H6) that the activewear condition would elicit lower implicit self-esteem scores compared to the casualwear and homewares conditions, the BIAT scores were compared across conditions from Time 1 to Time 2. There was no main effect of time, $F(1, 105) = .57, p = .45, \eta_p^2 = .00$, but there was a significant main effect of shopping condition, $F(2, 105) = 5.86, p = .004, \eta_p^2 = .10$, and a significant interaction between time and shopping condition, $F(2, 123) = 3.29, p = .042, \eta_p^2 = .06$. As there were significant differences in BIAT scores at baseline, $F(2, 123) = 7.44, p < .001, \eta_p^2 = .12$, it was only appropriate to interpret changes within

each condition from Time 1 to Time 2, rather than differences between the conditions at Time 2. Specifically, there were no changes from Time 1 to Time 2 in BIAT scores for the casualwear ($p = .342, d = .17$) or homewares conditions ($p = .168, d = -.24$). However, there was a significant reduction from Time 1 to Time 2 in BIAT scores for the activewear condition ($p = .024, d = .38$), partly supporting the hypothesis that implicit self-esteem scores would decrease from Time 1 to Time 2 in the apparel shopping conditions. The BIAT means for each time point and condition have been reported in Table 2.

4.2.2.3. Mood. To test the hypotheses (H7 and H8) that the activewear condition would elicit lower positive mood and higher negative mood compared to the casualwear and homewares conditions, the BEES scores were compared across conditions from Time 1 to Time 2. There were main effects of time, $F(1, 122) = 23.56, p < .001, \eta_p^2 = .16$, and valence, $F(1, 122) = 230.73, p < .001, \eta_p^2 = .65$, but not shopping condition, $F(2, 122) = .04, p = .960, \eta_p^2 = .00$. There was also a two-way interaction between time and valence, $F(2, 122) = 5.05, p = .026, \eta_p^2 = .04$. Separate 2 (Shopping Condition) x 2 (Time) ANOVAs were then performed for positive and negative mood. For positive mood, there were no main effects of time, $F(1, 122) = .64, p = .43, \eta_p^2 = .01$, or shopping condition, $F(2, 122) = 1.32, p = .271, \eta_p^2 = .02$, and no interaction, $F(2, 122) = .69, p = .50, \eta_p^2 = .01$. For negative mood, there was a main effect of time, $F(1, 122) = 20.94, p < .001, \eta_p^2 = .15$, but not shopping condition, $F(2, 122) = 2.01, p = .139, \eta_p^2 = .03$, and no interaction, $F(2, 122) = 1.15, p = .32, \eta_p^2 = .02$. Specifically, overall, there was a significant reduction in negative mood across all the shopping conditions ($p < .001, d = .41$). Therefore, the positive and negative mood hypotheses were not supported. The mood means for each time point and condition have been reported in Table 2.

4.2.2.4. Gaze behavior. To test the hypothesis (H9) that the activewear condition would elicit higher body gaze behavior compared to the casualwear and homewares conditions, the body gaze scores were compared across conditions from Time 1 to Time 2. There were no main effects of time, $F(1, 112) = 1.59, p = .211, \eta_p^2 = .01$, shopping condition, $F(2, 112) = 1.42, p = .246, \eta_p^2 = .03$, or dress, $F(1, 112) = 3.48, p = .065, \eta_p^2 = .03$. There were also no two-way or three-way interactions ($ps > .41$). Therefore, the body gaze hypotheses were not supported. The body score means for each time point and condition have been reported in Table 2.

4.2.3. Correlational analyses

To address our exploratory analyses, further partial correlations (controlling for age) were conducted to examine potential associations between self-reported attitudes and engagement with the shopping task (amount spent) in each of the experimental conditions. In the casualwear condition, the amount spent (\$AUD) in the shopping activity correlated significantly with body gaze ($r_{Time 1} = .45, p_{Time 1} = .008; r_{Time 2} = .35, p_{Time 2} = .039$). That is, women who engaged in higher body gaze behavior also spent more on casualwear. In the homewares condition, the amount spent (\$AUD) in the shopping activity correlated

Table 2
Descriptive Statistics for Experimental Variables at Time 1 and Time 2, Separated by Shopping Condition.

Variable	Activewear Condition				Casualwear Condition				Homewares Condition			
	Time 1		Time 2		Time 1		Time 2		Time 1		Time 2	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
State Body Image	5.77	1.72	5.11	1.57	5.20	1.49	5.30	1.64	5.02	1.35	5.26	1.25
Implicit Self-esteem	0.47	0.28	0.28	0.32	0.59	0.29	0.52	0.31	0.28	0.40	0.39	0.36
Positive Mood	2.69	0.60	2.63	0.77	2.91	0.51	2.83	0.68	2.76	0.54	2.79	0.57
Negative Mood	1.69	0.59	1.56	0.54	1.48	0.41	1.35	0.37	1.66	0.62	1.41	0.52
Body Gaze – Fully	534.26	1297.46	640.72	1376.02	-35.14	1817.33	415.95	1609.65	.82	1280.72	15.18	1446.42
Body Gaze – Partially	576.10	1440.39	617.08	1615.76	332.49	1779.96	554.32	1811.51	138.77	1392.78	186.41	1649.55

Note. Fully = fully dressed, Partially = partially dressed; Body gaze is in milliseconds.

significantly with negative mood ($r_{Time 1} = .37$, $p_{Time 1} = .018$). That is, women who reported higher negative mood at Time 1 spent more on homewares. No other associations with amount spent were significant within each of the shopping conditions.

5. General discussion

Consistent with international sales data, the present study provides supporting self-report evidence that activewear is one of the most popular segments of apparel amongst women (Bringé, 2021). As such, continued research into the potential adverse effects of activewear imagery on women's psychological wellbeing is justified. In Study 1, correlational evidence showed that online shopping for women's apparel (including activewear) is linked with increased desires to be thin and self-objectification. These findings further substantiate prior correlational research showing that idealized imagery exposure is linked with women's appearance and self-objectification attitudes (Fardouly et al., 2017; Holland & Tiggemann, 2016). Importantly in Study 2, the experimental evidence showed that self-reported body image and implicit self-esteem were adversely influenced by exposure to the activewear website. However, there was no evidence to suggest that gaze behavior plays a role in understanding the effects of online shopping imagery on negative body image and self-esteem. We also found no evidence that online shopping for apparel had an adverse effect on mood. Instead, there was a general reduction in negative mood across all the online shopping conditions. This reduction in negative mood is consistent with prior shopping research and further supports arguments that online shopping might be an effective mood regulation strategy for women (Rick et al., 2014; Son & Lee, 2021). While we supported several of our hypotheses, many of the correlational effects were modest and the experimental effects require replication.

Our research makes several valuable contributions to the literature with regards to the impact of visual media on women's psychological wellbeing. Firstly, we report helpful data for understanding women's exposure to online apparel imagery. Specifically, these data help characterize women's clothing interests while quantifying the time spent engaging with online apparel imagery, with averages ranging between 90 and 100 min per week across both our studies. While other forms of visual media which also depict idealized and sexualized imagery of women, such as Instagram and Facebook, typically attract higher levels of engagement (Coyné et al., 2020; Scott et al., 2017), we have shown that online apparel shopping still represents a commonly accessed source of visual information for making body image judgements in women.

Secondly, through correlational analysis, we provide some guidance on the attitudes and behaviors that might be sustained through online apparel exposure. The most notable of the correlations in Study 1 was increased body surveillance in women who engage in more online apparel shopping. While this could suggest that exposure to online apparel imagery may facilitate or sustain a cognitive preoccupation with appearance monitoring, a key marker of self-objectification (Moradi & Huang, 2008), it is also possible that women who are pre-occupied with appearance monitoring may spend more time shopping for clothes. Indeed prior research suggests that body gaze behavior towards fashion imagery is linked to both appearance attitudes and body dissatisfaction (Tiggemann et al., 2019). While we anticipated that the link between apparel imagery exposure and self-objectification would be further substantiated in Study 2 through experimentally induced body gaze behavior in the activewear condition, we found little evidence that gaze behavior is affected by online shopping exposure. Correlational analyses in Study 2 showed that body gaze was positively correlated with amount spent on casualwear, but this likely reflects a general inclination to evaluate clothing amongst women who have higher purchase intentions.

Finally, our research is the first to experimentally demonstrate that a brief activewear shopping simulation can result in adverse changes in body image and self-esteem. As such, we argue that the accumulation of

even small body image and self-esteem decrements with regular exposure could lead to profound adverse effects on women's longer term psychological wellbeing. Given that 80–90% of participants across our two samples reported online shopping in the last month and most reported doing so between 2 and 3 days each week, these women were at heightened risk of having their body image repeatedly threatened over time. These findings are consistent with the broader literature on the negative effects of exposure to fitspiration imagery on women's wellbeing (Griffiths & Stefanovski, 2019; Tiggemann & Zaccardo, 2015). Specifically, fitspiration imagery also contains athletic and toned women who are readily encountered across various social media platforms (Deighton-Smith & Bell, 2018). Increased traffic towards activewear websites, such as the one used in the current study, likely reflects the capacity of fitspiration content to encourage women to adopt muscular and toned ideals instead of traditional thin ideals (Benton & Karazsia, 2015). Given the results of the current study and recent investigations on fitspiration, it can be argued that exposure to media content promoting athletic physiques, coupled with a subsequent interest in clothing styles such as activewear, may simultaneously act to disturb mood and body image among women.

5.1. Implications

The results of the present study raise multiple practical implications when applied to consumer and clinical contexts. Firstly, our results further highlight the responsibility of apparel retailers to consider the psychological wellbeing of their consumers with respect to body image and self-esteem. There is increasing pressure on brands to adopt more diverse and representative imagery when promoting their products so that female consumers in particular feel less threatened (Czerniawski, 2022; Gruys, 2022). Some innovative software solutions are already being developed to digitally manipulate apparel and model image dimensions to represent different sizes without the need to recruit a variety of models (Lewis & Guttag, 2022). However, using more representative imagery might create a tension between efforts to preserve the psychological wellbeing of consumers whilst still being financially successful in a competitive marketplace. Presumably, some brands will continue to use sexually objectifying imagery of women because they assume it will effectively capture the attention of their target market. In line with our results though, we encourage brands to actively consider the wellbeing of consumers by lessening the use of sexually objectifying imagery when marketing women's apparel. Such an approach may still be effective at bringing financial returns if brands can successfully improve the online shopping experience for women by diminishing threats to body image and self-esteem. For instance, if women feel more comfortable with the apparel imagery, it may encourage them to spend more time browsing and making purchases. Indeed, research has shown that women report lower product attractiveness and purchase intentions when presented with products which are marketed with sexualized female models, compared to neutral advertisements (Gramazio et al., 2021). Importantly, these effects were partially explained by negative affect, further highlighting the importance of measuring women's emotional responses to retail imagery.

Secondly, our results and others', suggests that online shopping is a potentially effective strategy for regulating mood amongst women (Rick et al., 2014; Son & Lee, 2021). This has important clinical implications given the role of mood across many psychological disorders (Beauchaine & Cicchetti, 2019; Robinaugh et al., 2020). One possibility is that online shopping serves as a distraction from pre-existing emotional and cognitive states which sustain negative affect, thus briefly alleviating negative feelings (Layouts et al., 2022). Interestingly, the absence of experimental effects on positive mood in our study suggests that these mood effects may be limited and not enduring. That is, brief distractions may successfully disrupt negative affect but not bolster positive affect. While some women may use online shopping to temporarily alleviate negative feelings, they might simultaneously increase their risk of low

body image or self-esteem if they browse websites containing imagery that threatens their body image. While it is plausible that the adverse effects of online shopping on body image and self-esteem might be *counteracted* to some degree by reductions in negative mood, women in our activewear condition still experienced significant reductions in body image and implicit self-esteem scores *despite* a general alleviation of negative mood. It may be important to educate women, particularly those undertaking clinical treatment, about the risks of using online apparel shopping for mood regulation and develop strategies to minimise their exposure to retailers which use threatening body imagery.

5.2. Limitations and future directions

While our study makes a valuable contribution to this area of scholarship, we recognise several limitations. The lack of experimental gaze effects suggested some challenges which may have prevented detecting any experimental effects. Specifically, the standard errors for the gaze data were particularly high. That is, even though the pattern of means were generally consistent with expectations, a substantially larger (and unfeasible) sample size was needed to overcome this degree of variability. Given that women have previously shown face-biased gaze behavior towards this image set (Hollett et al., 2022), it is possible that the high variability in the current study could be attributed to a competition between natural face gaze inclinations and a general priming effect to inspect clothing (even at baseline) because participants knew the study was about online apparel shopping behaviors.

We also acknowledge that it would be beneficial to measure gaze *during* the shopping activity to understand how the website stimuli directly influences behavior. However, it should be noted that data from lengthy gaze activities with dynamic areas of interest are much more difficult to process and analyse. Therefore, taking a random sample of website images and including them in a controlled presentation may be a more efficient option for understanding gaze towards different website material in future research. We opted to use controlled image presentations prior to and following the website exposure to enhance the external validity of the shopping simulation. Ultimately, a balance must be struck between external and internal validity when capturing gaze behavior and we encourage future work which informs the optimisation of gaze measurement procedures during simulated activities.

We note several self-report measurement limitations which were present in our study. Firstly, the baseline positive mood scores possessed low reliability ($\alpha = .59$) and while we opted to analyse these data, we recognise that potential measurement error would prohibit any confident conclusions. As there were no significant positive mood effects, we did not make any further interpretations regarding this measure. Secondly, while our single-item body image measurement offered convenience for repeated measurement and showed utility for detecting experimental effects, it may not have offered optimum psychometric properties in this context. Indeed, researchers have used brief multi-item scales for measuring state body image that we would recommend for future research with similar designs to ours (e.g., Fitzsimmons-Craft et al., 2015; Stevens & Griffiths, 2020).

We also recognise that our procedures are limited for drawing conclusions about the longer-term effects of online apparel shopping, including those with clinical relevance, such as disordered eating. Furthermore, there are substantial individual differences in the fluctuation of mood across different timeframes (Bringmann et al., 2016; Kuppens et al., 2007; Kuppens & Verduyn, 2017) and our brief simulation was limited for examining the effect of online shopping on mood. Our sample, predominantly secured from a university community may also limit our ability to generalise the findings because lifestyle factors associated with being students (e.g., lower income) might impact their online shopping habits in ways that differ to non-student populations.

There are several possible future directions to further inform our understanding of online apparel exposure on mood and potential clinical disturbances. For instance, ecological momentary assessments (e.g.,

smartphone tracking) to capture apparel website exposure with regular mood, self-worth and body image monitoring would determine if there are longer-term effects on body image and self-esteem. Regular mood monitoring would also confirm whether online shopping patterns reflect a mood regulation strategy in women. Further, physiological measures such as skin conductance and electrocardiogram might offer useful complements to self-reported measurements for understanding any influence of apparel imagery on mood. With increasing sophistication in wearable technologies, these biometrics may soon be available on consumer devices. While wearable technologies are typically designed to facilitate communication and capture fitness data, they also possess the capacity to provide valuable insight into real-time and longitudinal mental health outcomes. Indeed, research-ready devices already exist which can capture multiple biometrics, including ECG with high mobility (Burns et al., 2010; McCarthy et al., 2016). Given the high level of integration across smart technologies (e.g., phones, laptops, wearables, cloud databases), and presumably strong interest from retailers to understand consumer behavior, we suspect that large comprehensive data sets may soon be available for tracking the psychological effects of online apparel exposure.

5.3. Conclusions

Despite the limitations described, our study also possessed several strengths. For instance, we used multiple studies and measurement methods, including self-report, implicit attention, and gaze behavior to explore the psychological effects of online shopping. We also used a simulation paradigm to approximate a real-world experience under experimental conditions, which enhances the external validity of our observed effects. Finally, the collection of baseline data allowed us to examine both within and between-subjects experimental effects, which was critical for understanding the relative impact of the activewear condition. Overall, our descriptive and correlational results suggest that online apparel shopping is a readily accessed source of visual information among women which may play a role in facilitating or sustaining adverse body image judgements. Our experimental results suggest that exposure to activewear websites may be harmful to women's explicit and implicit psychological well-being. We hope that our methods and results encourage other researchers to continue to explore the potential harm and benefits of online apparel shopping on women's mental health.

Compliance with ethical standards

The data collection procedures reported were approved by the authors' university human research ethics committee. Informed consent was obtained from all participants.

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CRediT authorship contribution statement

Ross Hollett: Conceptualization, Methodology, Resources, Software, Formal analysis, Investigation, Writing – original draft, Writing – review & editing, Supervision. **Melanie Challis:** Writing – original draft, Writing – review & editing, Investigation.

Declaration of Competing Interest

The authors declare that this research was conducted in the absence of any conflicts of interest.

Data Availability

The data has been uploaded as part of the supplementary materials is available on figshare.com.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.bodyim.2023.07.004](https://doi.org/10.1016/j.bodyim.2023.07.004).

References

- Adams, K. E., Tyler, J. M., Calogero, R., & Lee, J. (2017). Exploring the relationship between appearance-contingent self-worth and self-esteem: The roles of self-objectification and appearance anxiety. *Body Image*, 23, 176–182. <https://doi.org/10.1016/j.bodyim.2017.10.004>
- Avalos, L., Tylka, T. L., & Wood-Barcalow, N. (2005). The Body Appreciation Scale: Development and psychometric evaluation. *Body Image*, 2(3), 285–297. <https://doi.org/10.1016/j.bodyim.2005.06.002>
- Bareket, O., Shnabel, N., Abeles, D., Gervais, S., & Yuval-Greenberg, S. (2018). Evidence for an association between men's spontaneous objectifying gazing behavior and their endorsement of objectifying attitudes toward women. *Sex Roles*, 81(3–4), 245–256. <https://doi.org/10.1007/s11199-018-0983-8>
- Bartky, S. L. (1990). *Femininity and Domination: Studies in the Phenomenology of Oppression*. Routledge. <https://doi.org/10.4324/9780203825259>
- Beauchaine, T. P., & Cicchetti, D. (2019). Emotion dysregulation and emerging psychopathology: A transdiagnostic, transdisciplinary perspective. *Development and Psychopathology*, 31(3), 799–804. <https://doi.org/10.1017/S0954579419000671>
- Behm-Morawitz, E. (2017). Examining the intersection of race and gender in video game advertising. *Journal of Marketing Communications*, 23(3), 220–239. <https://doi.org/10.1080/13527266.2014.914562>
- Benton, C., & Karazsia, B. T. (2015). The effect of thin and muscular images on women's body satisfaction. *Body Image*, 13, 22–27. <https://doi.org/10.1016/j.bodyim.2014.11.001>
- Black, I. R., & Morton, P. (2017). Appealing to men and women using sexual appeals in advertising: In the battle of the sexes, is a truce possible? *Journal of Marketing Communications*, 23(4), 331–350. <https://doi.org/10.1080/13527266.2015.1015108>
- Brice, J., Thorpe, H., Wheaton, B., & Longhurst, R. (2022). Postfeminism, consumption and activewear: Examining women consumers' relationship with the postfeminine ideal, 14695405221129826 *Journal of Consumer Culture*, 0(0). <https://doi.org/10.1177/14695405221129826>
- Bringé, A. (2021). The rise of athleisure in the fashion industry and what it means for brands. Forbes. <https://www.forbes.com/sites/forbescommunicationscouncil/2021/05/03/the-rise-of-athleisure-in-the-fashion-industry-and-what-it-means-for-brands/?sh=4528709c3ae0>
- Bringmann, L. F., Pe, M. L., Vissers, N., Ceulemans, E., Borsboom, D., Vanpaemel, W., Tuerlinckx, F., & Kuppens, P. (2016). Assessing temporal emotion dynamics using networks. *Assessment*, 23(4), 425–435. <https://doi.org/10.1177/1073191116645909>
- Brown, Z., & Tiggemann, M. (2016). Attractive celebrity and peer images on Instagram: effect on women's mood and body image. *Body Image*, 19, 37–43. <https://doi.org/10.1016/j.bodyim.2016.08.007>
- Burns, A., Greene, B. R., McGrath, M. J., Shea, T. J. O., Kuris, B., Ayer, S. M., Stroescu, F., & Cionca, V. (2010). SHIMMER™ – A wireless sensor platform for noninvasive biomedical research. *IEEE Sensors Journal*, 10(9), 1527–1534. <https://doi.org/10.1109/JSEN.2010.2045498>
- Burns, L.D., Mullet, K.K., & Bryant, N.O. (2016). *The business of fashion: Designing, manufacturing, and marketing*. Bloomsbury Publishing USA.
- Cash, T. F., Fleming, E. C., Alindogan, J., Steadman, L., & Whitehead, A. (2002). Beyond body image as a trait: The development and validation of the body image states scale. *Eating Disorders*, 10(2), 103–113. <https://doi.org/10.1080/10640260290081678>
- Cash, T. F., Melnyk, S. E., & Hrabosky, J. I. (2004). The assessment of body image investment: An extensive revision of the appearance schemas inventory. *International Journal of Eating Disorders*, 35(3), 305–316. <https://doi.org/10.1002/eat.10264>
- Coyne, S. M., Rogers, A. A., Zurcher, J. D., Stockdale, L., & Booth, M. (2020). Does time spent using social media impact mental health?: An eight year longitudinal study. *Computers in Human Behavior*, 104, Article 106160. <https://doi.org/10.1016/j.chb.2019.106160>
- Czerniawski, A. M. (2022). “Real” bodies in plus-size fashion. *Fatty Studies*, 11(3), 231–243. <https://doi.org/10.1080/21604851.2021.1913827>
- Deighton-Smith, N., & Bell, B. T. (2018). Objectifying fitness: A content and thematic analysis of #fitspiration images on social media. *Psychology of Popular Media Culture*, 7, 467–483. <https://doi.org/10.1037/ppm0000143>
- Downs, E., & Smith, S. (2010). Keeping abreast of hypersexuality: A video game character content analysis. *Sex Roles*, 62(11–12), 721–733. <https://doi.org/10.1007/s11199-009-9637-1>
- Fardouly, J., Pinkus, R. T., & Vartanian, L. R. (2017). The impact of appearance comparisons made through social media, traditional media, and in person in women's everyday lives. *Body Image*, 20, 31–39. <https://doi.org/10.1016/j.bodyim.2016.11.002>
- Fitzsimmons-Craft, E. E., Bardone-Cone, A. M., Wonderlich, S. A., Crosby, R. D., Engel, S. G., & Bulik, C. M. (2015). The relationships among social comparisons, body surveillance, and body dissatisfaction in the natural environment. *Behavior Therapy*, 46(2), 257–271. <https://doi.org/10.1016/j.beth.2014.09.006>
- Fredrickson, B. L., & Roberts, T. (1997). Objectification theory: Toward understanding women's lived experiences and mental health risks. *Psychology of Women Quarterly*, 21(2), 173–206. <https://doi.org/10.1111/j.1471-6402.1997.tb00108.x>
- Garvin, A. W., & Damsion, C. (2008). The effects of idealized fitness images on anxiety, depression and global mood states in college age males and females. *Journal of Health Psychology*, 13(3), 433–437. <https://doi.org/10.1177/1359105307088146>
- Gemar, M. C. (2001). Mood-induced changes on the Implicit Association Test in recovered depressed patients. *Journal of Abnormal Psychology*, 110(2), 282–289. <https://doi.org/10.1037//0021-843x.110.2.282>
- Gervais, S. J., Holland, A. M., & Dodd, M. D. (2013). My eyes are up here: The nature of the objectifying gaze toward women. *Sex Roles*, 69(11), 557–570. <https://doi.org/10.1007/s11199-013-0316-x>
- Gramazio, S., Cadinu, M., Guizzo, F., & Carnaghi, A. (2021). Does sex really sell? Paradoxical effects of sexualization in advertising on product attractiveness and purchase intentions. *Sex Roles*, 84(11), 701–719. <https://doi.org/10.1007/s11199-020-01190-6>
- Greenwald, A. G. (2002). A unified theory of implicit attitudes, stereotypes, self-esteem, and self-concept. *Psychological Review*, 109(1), 3–25. <https://doi.org/10.1037/0033-295x.109.1.3>
- Greenwald, A. G., & Farnham, S. D. (2000). Using the implicit association test to measure self-esteem and self-concept. *Journal of Personality and Social Psychology*, 79(6), 1022–1038. <https://doi.org/10.1037/0022-3514.79.6.1022>
- Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the implicit association test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology*, 85(2), 197–216. <https://doi.org/10.1037/0022-3514.85.2.197>
- Griffiths, S., & Stefanovski, A. (2019). Thinspiration and fitspiration in everyday life: An experience sampling study. *Body Image*, 30, 135–144. <https://doi.org/10.1016/j.bodyim.2019.07.002>
- Gruys, K. (2022). Fit models, not fat models: Body inclusiveness in the U.S. fit modeling job market. *Fatty Studies*, 11(3), 244–257. <https://doi.org/10.1080/21604851.2021.1913814>
- Hewig, J., Trippe, R. H., Hecht, H., Straube, T., & Miltner, W. H. R. (2008). Gender differences for specific body regions when looking at men and women. *Journal of Nonverbal Behavior*, 32(2), 67–78. <https://doi.org/10.1007/s10919-007-0043-5>
- Holland, E., & Haslam, N. (2013). Worth the weight: The objectification of overweight versus thin targets. *Psychology of Women Quarterly*, 37(4), 462–468. <https://doi.org/10.1177/0361684312474800>
- Holland, G., & Tiggemann, M. (2016). A systematic review of the impact of the use of social networking sites on body image and disordered eating outcomes. *Body Image*, 17, 100–110. <https://doi.org/10.1016/j.bodyim.2016.02.008>
- Hollett, R. C., Morgan, H., Chen, N. T. M., & Gignac, G. E. (2019). Female characters from adult-only video games elicit a sexually objectifying gaze in both men and women. *Sex Roles*, 83(1), 29–42. <https://doi.org/10.1007/s11199-019-01096-y>
- Hollett, R. C., Panaia, P. M., & Smart, A. H. (2023). Gaze behavior, body image in women and online apparel shopping. *International Journal of Consumer Studies*. <https://doi.org/10.1111/ijcs.12977>
- Hollett, R. C., Rogers, S. L., Florido, P. M., & Mosdell, B. A. (2022). Body gaze as a marker of sexual objectification: A new scale for pervasive gaze and gaze provocation behaviors in heterosexual women and men. *Archives of Sexual Behavior*. <https://doi.org/10.1007/s10508-022-02290-y>
- Homan, K., McHugh, E., Wells, D., Watson, C., & King, C. (2012). The effect of viewing ultra-fit images on college women's body dissatisfaction. *Body Image*, 9(1), 50–56. <https://doi.org/10.1016/j.bodyim.2011.07.006>
- Horton, K., Ferrero-Regis, T., & Payne, A. (2016). The hard work of leisure: healthy life, activewear and Lorna Jane. *Annals of Leisure Research*, 19(2), 180–193. <https://doi.org/10.1080/11745398.2015.1111149>
- Inquisit. (2018). *Millisecond Software*. In Millisecond Software Seattle, WA.
- Kambooropoulos, N., & Staiger, P. K. (2001). The influence of sensitivity to reward on reactivity to alcohol-related cues. *Addiction*, 96(8), 1175–1185. <https://doi.org/10.1046/j.1360-0443.2001.968117510.x>
- Karsay, K., Knoll, J., & Matthes, J. (2017). Sexualizing media use and self-objectification: A meta-analysis. *Psychology of Women Quarterly*, 42(1), 9–28. <https://doi.org/10.1177/0361684317743019>
- Karsay, K., & Matthes, J. (2016). Sexually objectifying pop music videos, young women's self-objectification, and selective exposure. *Communication Research*, 1–23. <https://doi.org/10.1177/0093650216661434>
- Karsay, K., Matthes, J., Platzer, P., & Plinke, M. (2018). Adopting the objectifying gaze: Exposure to sexually objectifying music videos and subsequent gazing behavior. *Media Psychology*, 21(1), 27–49. <https://doi.org/10.1080/15213269.2017.1378110>
- Kim, H., & Damhorst, M. L. (2010). The relationship of body-related self-discrepancy to body dissatisfaction, apparel involvement, concerns with fit and size of garments, and purchase intentions in online apparel shopping. *Clothing and Textiles Research Journal*, 28, 239–254. <https://doi.org/10.1177/0887302X10379266>
- Kleemann, M., Daalmans, S., Carbaat, I., & Anschutz, D. (2018). Picture perfect: The direct effect of manipulated instagram photos on body image in adolescent girls. *Media Psychology*, 21(1), 93–110. <https://doi.org/10.1080/15213269.2016.1257392>
- Kuppens, P., Van Mechelen, I., Nezelek, J. B., Dossche, D., & Timmermans, T. (2007). Individual differences in core affect variability and their relationship to personality and psychological adjustment. *Emotion*, 7(2), 262–274. <https://doi.org/10.1037/1528-3542.7.2.262>

- Kuppens, P., & Verduyn, P. (2017). Emotion dynamics. *Current Opinion in Psychology*, 17, 22–26. <https://doi.org/10.1016/j.copsyc.2017.06.004>
- Layous, K., Kumar, S. A., Arendtson, M., & Najera, A. (2022). The effects of rumination, distraction, and gratitude on positive and negative affect. *Journal of Personality and Social Psychology, No Pagination Specified-No Pagination Specified*, 124(5), 1053–1078. <https://doi.org/10.1037/pspp0000440>
- Leahy, T. M., Crowther, J. H., & Mickelson, K. D. (2007). The frequency, nature, and effects of naturally occurring appearance-focused social comparisons. *Behavior Therapy*, 38(2), 132–143. <https://doi.org/10.1016/j.beth.2006.06.004>
- Lee, J. Y., & Johnson, K. K. P. (2012). The effects of “me-model” body-size discrepancy on young Korean consumer’s shopping mood, store satisfaction, and intention to revisit online apparel stores. *Journal of the Korean Society of Clothing and Textiles*, 36(12), 1297–1309. <https://doi.org/10.5850/jksct.2012.36.12.1297>
- Levine, M. P., & Murnen, S. K. (2009). “Everybody knows that mass media are/are not [pick one] a cause of eating disorders”: A critical review of evidence for a causal link between media, negative body image, and disordered eating in females. *Journal of Social and Clinical Psychology*, 28(1), 9–42. <https://doi.org/10.1521/jscp.2009.28.1.9>
- Lewis, K. M., & Guttag, J. (2022). SizeGAN: Improving size representation in clothing catalogs. *arXiv Preprint*. <https://doi.org/10.48550/arXiv.2211.02892>
- Lipson, S. M., Stewart, S., & Griffiths, S. (2020). Athleisure: A qualitative investigation of a multi-billion-dollar clothing trend. *Body Image*, 32, 5–13. <https://doi.org/10.1016/j.bodyim.2019.10.009>
- Liu, F., Cheng, H., & Li, J. (2009). Consumer responses to sex appeal advertising: A cross-cultural study. *International Marketing Review*, 26(4/5), 501–520. <https://doi.org/10.1108/02651330910972002>
- Loughnan, S., & Pacilli, M. (2014). Seeing (and treating) others as sexual objects: Toward a more complete mapping of sexual objectification (, G) Testing. *Psychometrics, Methodology in Applied Psychology*, 21(3), 309–325. <https://psycnet.apa.org/record/2014-43997-006>.
- Luna Mora, J., & Berry, J. (2021). The invisible corset: Discipline, control and surveillance in contemporary yogawear. *Film, Fashion & Consumption*, 10(2), 401–423. https://doi.org/10.1386/ffc_00032_1
- McCarthy, C., Pradhan, N., Redpath, C., & Adler, A. (2016). Validation of the Empatica E4 wristband. 2016 IEEE EMBS international student conference (ISC),
- McKinley, N. M., & Hyde, J. S. (1996). The objectified body consciousness scale development and validation. *Psychology of Women Quarterly*, 20(2), 181–215. <https://doi.org/10.1111/j.1471-6402.1996.tb00467.x>
- Moradi, B., & Huang, Y.-P. (2008). Objectification theory and psychology of women: A decade of advances and future directions. *Psychology of Women Quarterly*, 32(4), 377–398. <https://doi.org/10.1111/j.1471-6402.2008.00452.x>
- Moradi, B., & Varnes, J. R. (2017). Structure of the Objectified Body Consciousness Scale: Reevaluated 20 years later. *Sex Roles*, 77(5), 325–337. <https://doi.org/10.1007/s11199-016-0731-x>
- Moya-Garófano, A., & Moya, M. (2019). Focusing on one’s own appearance leads to body shame in women but not men: The mediating role of body surveillance and appearance-contingent self-worth. *Body Image*, 29, 58–64. <https://doi.org/10.1016/j.bodyim.2019.02.008>
- Myers, T. A., & Crowther, J. H. (2009). Social comparison as a predictor of body dissatisfaction: A meta-analytic review. *Journal of Abnormal Psychology*, 118(4), 683–698. <https://doi.org/10.1037/a0016763>
- Nummenmaa, L., Hietanen, J. K., Santtila, P., & Hyönä, J. (2012). Gender and visibility of sexual cues influence eye movements while viewing faces and bodies. *Archives of Sexual Behavior*, 41(6), 1439–1451. <https://doi.org/10.1007/s10508-012-9911-0>
- O’Sullivan, G. A., Hanlon, C., Spaaij, R., & Westerbeek, H. (2017). Women’s activewear trends and drivers: A systematic review. *Journal of Fashion Marketing and Management: An International Journal*, 21(1), 2–15. <https://doi.org/10.1108/JFMM-07-2015-0059>
- 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 & Adolescent Psychology*, 35(4), 539–549. https://doi.org/10.1207/s15374424jccp3504_5
- Pounders, K. (2018). Are portrayals of female beauty in advertising finally changing? *Journal of Advertising Research*, 58, 133–137. <https://doi.org/10.2501/JAR-2018-021>
- 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>
- Rick, S. I., Pereira, B., & Burson, K. A. (2014). The benefits of retail therapy: Making purchase decisions reduces residual sadness. *Journal of Consumer Psychology*, 24(3), 373–380. <https://doi.org/10.1016/j.jcps.2013.12.004>
- Robinaugh, D. J., Hoekstra, R. H. A., Toner, E. R., & Borsboom, D. (2020). The network approach to psychopathology: A review of the literature 2008–2018 and an agenda for future research. *Psychological Medicine*, 50(3), 353–366. <https://doi.org/10.1017/S0033291719003404>
- Rogers, S. L., Hollett, R. C., Mills, B., Cruickshank, T., Nosaka, K., & Bhullar, N. (2023). Psychometric evaluation of the Brief Emotional Experience Scale (BEES) for assessing emotional wellbeing. *PsyArxiv*. <https://doi.org/10.31234/osf.io/y96wg>
- Rosenberg, H. (2009). Clinical and laboratory assessment of the subjective experience of drug craving. *Clinical Psychology Review*, 29(6), 519–534. <https://doi.org/10.1016/j.cpr.2009.06.002>
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton University Press.
- Rudman, L. A. (2007). Implicit self-esteem compensation: Automatic threat defense. *Journal of Personality and Social Psychology*, 93(5), 798–813. <https://doi.org/10.1037/0022-3514.93.5.798>
- Schaefer, L. M., Burke, N. L., Thompson, K. J., Dedrick, R. F., Heinberg, L. J., Calogero, R. M., Bardone-Cone, A. M., Higgins, M. K., Fredrick, D. A., Mackenzie, K., Anderson, D. A., Shaumburg, K., Nerina, A., Stefanile, C., Dittmar, H., Clark, E., Adams, Z., Macwana, S., Klump, K. L., Vercellone, A. C., Paxton, S. J., & Swami, V. (2015). Development and validation of the sociocultural attitudes towards appearance questionnaire-4 (SATAQ-4). *Psychological Assessment*, 27(1), 54. <https://doi.org/10.1037/a0037917>
- Schaefer, L. M., & Thompson, J. K. (2014). The development and validation of the Physical Appearance Comparison Scale-Revised (PACS-R). *Eating Behaviors*, 15(2), 209–217. <https://doi.org/10.1016/j.eatbeh.2014.01.001>
- Scott, C. F., Bay-Cheng, L. Y., Prince, M. A., Nochajski, T. H., & Collins, R. L. (2017). Time spent online: Latent profile analyses of emerging adults’ social media use. *Computers in Human Behavior*, 75, 311–319. <https://doi.org/10.1016/j.chb.2017.05.026>
- Shukla, M., Jain, V., & Misra, R. (2022). Factors influencing smartphone based online shopping: an empirical study of young Women shoppers. *Asia Pacific Journal of Marketing and Logistics*, 34(5), 1060–1077. <https://doi.org/10.1108/APJML-01-2021-0042>
- Son, H., & Lee, J. (2021). Does online shopping make people feel better? The therapeutic effect of online shopping on Korean female consumers’ mood, self-esteem, and self-efficacy: Based on the context of fashion product shopping. *Journal of Global Scholars of Marketing Science*, 31(4), 580–597. <https://doi.org/10.1080/21639159.2020.1808821>
- Sriram, N., & Greenwald, A. G. (2009). The brief implicit association test. *Experimental Psychology*, 56(4), 283–294. <https://doi.org/10.1027/1618-3169.56.4.283>
- Stevens, A., & Griffiths, S. (2020). Body Positivity (#BoPo) in everyday life: An ecological momentary assessment study showing potential benefits to individuals’ body image and emotional wellbeing (https://doi.org/https://) *Body Image*, 35, 181–191. <https://doi.org/10.1016/j.bodyim.2020.09.003>
- Tiggemann, M., Brown, Z., & Thomas, N. (2019). (Don’t) look here!: The effect of different forms of label added to fashion advertisements on women’s visual attention. *Body Image*, 31, 88–95. <https://doi.org/10.1016/j.bodyim.2019.08.011>
- Tiggemann, M., & Lacey, C. (2009). Shopping for clothes: Body satisfaction, appearance investment, and functions of clothing among female shoppers. *Body Image*, 6(4), 285–291. <https://doi.org/10.1016/j.bodyim.2009.07.002>
- 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., & Kroon Van Diest, A. M. (2014). You looking at her “hot” body may not be “cool” for me: Integrating male partners’ pornography use into objectification theory for women. *Psychology of Women Quarterly*, 39(1), 67–84. <https://doi.org/10.1177/0361684314521784>
- Tylka, T. L., & Wood-Barcalow, N. L. (2015). 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>
- Veldhuis, J., Alleva, J. M., Bij de Vaate, A. J. D., Keijer, M., & Konijn, E. A. (2020). Me, my selfie, and I: The relations between selfie behaviors, body image, self-objectification, and self-esteem in young women. *Psychology of Popular Media*, 9, 3–13. <https://doi.org/10.1037/ppm0000206>
- Ward, B. (2021). Fashion ecommerce: 11 essential statistics. <https://www.salecycle.com/blog/featured/online-fashion-retail-11-essential-statistics/>
- Watts, L., & Chi, T. (2019). Key factors influencing the purchase intention of activewear: An empirical study of US consumers. *International Journal of Fashion Design, Technology and Education*, 12(1), 46–55. <https://doi.org/10.1080/17543266.2018.1477995>
- Yu, U.-J., Kozar, J. M., & Damhorst, M. L. (2013). Influence of multiple age identities on social comparison, body satisfaction, and appearance self-discrepancy for women across the life span. *Family and Consumer Sciences Research Journal*, 41(4), 375–392. <https://doi.org/10.1111/fcsr.12025>
- Zhou, X. (2018). Dress for fit: An exploration of female activewear consumption. *Sport Management Review*, 21(4), 403. <https://doi.org/10.1016/j.smr.2017.09.001>