Subliminally-Presented Media Images and their Effect on Appearance Anxiety: A Replication of Chatard et al. (2017)

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Abstract

Body dissatisfaction – dysfunctional, harmful beliefs about one's weight and body shape – is particularly prevalent among women in Westernized, high socioeconomic societies (Swami et al., 2010). One possible explanation is that there are a greater proportion of "thin-ideal" images present in such societies, which have led to appearance-related pressure specifically on women (Swami et al. 2010). The mechanism by which these types of images affect women's body dissatisfaction levels is thought to be social comparison – the notion that people have an inherent drive to evaluate themselves and look to other people as standards against which to do this (Festinger, 1954). Many studies have shown an effect whereby social comparisons with media images decrease body dissatisfaction (Grabe et al., 2008; Vartanian & Dey, 2013; Dittmar & Howard, 2004). One thing that is currently unknown is the extent to which these comparisons are automatic, in the sense of being unintentional and relatively mentally effortless. The current study is a direct replication of a study seeming to show automatic comparisons to subliminally-presented thin-ideal media images (Chatard, Barthélémy, Selimbegovic, & Guimond, 2017). Using the original stimuli, the present study found that subliminal presentations of media images did not automatically affect appearance anxiety. Theoretical implications and directions for further research are discussed.

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"What a pretty girl you are". "Wow. Look at you, you're so beautiful". "You know, if you cut your hair you would look much prettier". If these statements are familiar, it is likely because contemporary, and particularly North American, societies, often place great importance on idealized outward appearance and physical attractiveness, especially in women (Buote, Wilson, Strahan, Gazzola, & Papps, 2011). This tendency towards valuing physical attractiveness can have a significant impact on one's view of oneself and others – for instance, one meta-analysis found that individuals judged as attractive were more likely than those seen as unattractive to be identified as capable in their occupations, to have success, and to be treated better by others (Swami et al., 2010).

The particular details of what is seen as ideally attractive vary across both time and culture. According to Swami et al. (2010), available evidence suggests that the ideal body shape tends to be thinner in areas of high socioeconomic status in comparison to those of low socioeconomic status, particularly in Westernized cultures. Moreover, within such cultures, characteristics of the "ideal" appearance for women have seemingly become thinner and thinner over the past century, and appear to be more clearly defined, and more recognizable, than those for men (Buote et al., 2011). While standards of "ideal appearance" do exist for both genders, men see fewer images of a concretely defined "idealized male" than women see of an "idealized female" and the images that men see tend to be more varied in appearance (Buote et al., 2011).

This type of "thin-ideal" image present in higher socioeconomic societies has led to more appearance-related pressure on women in these areas, and has likely had a negative effect on their overall well-being (Swami et al., 2010). "Body dissatisfaction" is the term most commonly

used to describe this problem, and it refers to dysfunctional, harmful beliefs and feelings about one's weight and body shape (Garner, 2002). Body dissatisfaction tends to develop relatively early – sometimes affecting girls as young as 7 years old, and it also appears to exist among people varying in body size and race (Grabe, Ward, & Hyde, 2008). However it does not appear to be as significant of an issue in non-Western societies (Swami et al., 2010). With the exception of women from South America (with whom they were tied), Swami et al. (2010) found that North American adult women displayed the highest levels of body dissatisfaction in the world. Unfortunately, some studies indicate that, once it has begun, body dissatisfaction does not appear to decrease with age (Grabe et al., 2008).

Many researchers believe that one significant contributor to the societal pressure that women feel regarding their appearance is exposure to "thin-ideal" images through the mass media (Grabe et al., 2008). The mechanism by which these images affect women's body dissatisfaction is thought to be social comparison (Festinger, 1954).

The Role of Social Comparison in Body Dissatisfaction

One of the strongest predictors of body dissatisfaction is social comparison (Myers & Crowther, 2009), a term which stems from "social comparison theory". First developed in 1954, Leon Festinger proposed that people have an inherent drive to evaluate their opinions, skills, and characteristics. In rare cases, a person can evaluate their characteristics or abilities via some kind of official ranking system, as is the case for professional chess players who are ranked using the ELO system. However, more often no such official ranking is available and instead people look to others for standards against which to compare themselves (Myers & Crowther, 2009). This is the case for attractiveness, for instance, in which people often report making comparisons with

other people for the purpose of evaluating their own appearance (Leahey, Crowther & Mickelson, 2007).

A meta-analysis by Myers and Crowther (2009) specifically focused on social comparison as a predictor of body dissatisfaction. These researchers wanted to aggregate data from several studies to determine the relationship, if any, between upward, appearance-based social comparisons and body dissatisfaction. Upward social comparison occurs when someone compares themselves to another whom they believe to be better off in some way than themselves (Myers & Crowther, 2009). These are contrasted with downward comparisons, in which individuals compare to others who seem worse off than themselves. Upward comparisons are often associated with increased emotional pain and decreased self-esteem (Ditmar & Howard, 2004). Consistent with previous research, Myers and Crowther hypothesized that social comparisons would be positively linked to body dissatisfaction in both men and women, but that the association would be stronger in women. Additionally, they hypothesized that younger girls would be more affected by these comparisons than older women. Only studies which included both men and women, both older and younger participants, had a minimum of 30 participants, and were conducted in English were included in the meta-analysis. The results were that comparing oneself to other people based on appearance was related to greater levels of body dissatisfaction, and that this effect was in fact even bigger for women, specifically young women (Myers & Crowther, 2009).

Furthermore, Leahey et al. (2007) also found that women with high levels of body dissatisfaction engaged in more appearance-based (specifically upward) social comparisons than those with low levels of body dissatisfaction. Upward social comparisons in general were accompanied by more negative consequences than downward social comparisons in all women

(Leahey et al., 2007). Women high in body dissatisfaction also tended to be very preoccupied with body shape and weight, and thus it may be a more normal behaviour for these women to scan their own environment for weight-associated stimuli, and to notice the weight of others more frequently (Leahey et al., 2007).

These findings have significant implications for the everyday life of women, particularly in Westernized societies, where, as previously mentioned, the beauty ideal has become increasingly thin. This means that, in terms of body size, the ideal standards of attractiveness that are communicated through the mass media are likely to represent upward comparisons for most women; that is, so-called "thin-ideal" media images are likely to be a good deal thinner than the average woman. Many researchers have thus studied the possible role that media images can play in rates of body dissatisfaction, as moderated by the degree of comparison that women engage in with them.

Effect of Media Image Comparison on Body Dissatisfaction

Grabe et al. (2008) specifically examined the role that the media can play in body image concerns for women. These researchers examined both experimental designs – those which tested whether women felt worse about their bodies after being shown thin media models in comparison to other images – and correlational research – wherein the relationship between women's media intake and their body-related issues (such as eating disorder symptomology) was examined.

To improve upon the validity of previously conducted meta-analyses, Grabe et al. included a large sample size of seventy-seven articles, including both published and unpublished studies. Four outcome variables were analyzed: body dissatisfaction – measures testing a person's subjective evaluation of their own body; body self-consciousness – scales to determine

self-objectification of the body; internalization of the thin ideal – measuring how strongly individuals value their own thinness and others' thinness; and eating behaviours/beliefs – measures which assessed the degree of restrained eating, excessive exercise, or binging and purging. Additionally, self-report measures of media use were collected. The results showed robust support for the idea that exposure to mass media images portraying the thin-ideal was associated with women's susceptibility to body image concerns, and this finding was consistent across both experimental and correlational studies. Specifically, these images seemed to play a role in women's increased focus on appearance and increased body dissatisfaction as well as disordered eating behaviours (Grabe et al., 2008).

The specific role of "thin-ideal internalization" – or the endorsement of the thin ideal – on body dissatisfaction has also been studied. Thin-ideal internalization occurs when the ultra-thin bodies often shown in the media are used as standards of women's *personal* ideals. Those women who aspire to achieve this thin-ideal image frequently fail to achieve it, and as a result, many experience negative feelings about their bodies (Vartanian & Dey, 2013). This construct is typically measured by assessing the extent to which people are aware of and endorse this ideal thin standard. For example, one measure, *The Sociocultural Attitudes Toward Appearance Questionnaire*, contains items such as "I've felt pressure from TV or magazines to lose weight", and "I would like my body to look like the models who appear in magazines" (Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004). Thin-ideal internalization, and not just awareness, is an important element in the formula for the development of body dissatisfaction, and the combination of high internalization and social comparison tendencies is particularly detrimental (Dittmar & Howard, 2004).

While there has been much research conducted on the social comparisons young girls and women make with media images, and how these relate to body dissatisfaction, one less well-researched line of inquiry has been how automatic these social comparison processes are. Among other things, questions of automaticity include: Are individuals aware that they are comparing themselves to others? Or are these comparisons happening automatically, without conscious endorsement or rejection? These questions are important ones, as if social comparisons are automatic, meaning that they do not require much conscious effort, they may be very difficult to control. This could indicate that individuals are engaging in social comparison with media images and internalizing the resulting negative effects – without even knowing that they are doing this.

What is Automaticity?

To understand the automaticity, or lack thereof, of social comparisons, the term itself first needs to be dissected. Citing Bargh (1994), Payne (2012) outlines four different meanings of automaticity: awareness, intentionality, controllability, and efficiency.

A cognitive process can be considered automatic first and foremost if it occurs outside of awareness; that is, if the mental process can be carried out without a person knowing it is happening. This criterion is related to the second meaning of automaticity; whether a process can be controlled. A lack of awareness that a process is being carried out means that one also lacks control over it; in other words, that once it starts, the process cannot be stopped. A third meaning of automaticity relates to intentionality. A process that is started unintentionally can also be considered automatic. The intentionality and controllability criteria can thus be viewed as two parts to a whole. According to these criteria, a process is automatic if there is no choice involved in initiating a process (intentionality), and there is furthermore no ability to stop or inhibit that

process once it has begun (control) (Payne, 2012). Efficiency, or the measure of the speed of a mental process, is the fourth and final meaning of automaticity because an automatic process is one that requires limited cognitive resources to be dedicated to it, and thus an automatic task would likely be carried out quickly and even when the mind is busy doing other things (Payne, 2012).

These four criteria are not entirely separate from one another when it comes to determining whether an action is automatic; in fact they are often interconnected. While an effect can be automatic by one criteria and not by another, the criteria certainly tend to occur together, because – for example – you cannot initiate or inhibit an action that you are not aware you are doing (Payne, 2012). One example of an everyday behaviour that conforms to these criteria of automaticity is reading. While at first this process is non-automatic – meaning that it requires effort, control, intention, and awareness to carry out – with repeated practice it becomes automatic. When you become a skilled reader, reading becomes effortless and hard to control. Evidence of this can be drawn from the *Stroop Interference* task, wherein participants routinely take longer to identify colour-incongruent stroop words (i.e. when asked to read the word BLUE written in green ink) when compared to identifying colour-neutral words (i.e. when asked to read the word DEAL written in green ink) (Augustinova & Ferrand, 2014). This shows that reading eventually becomes so automatic that we can no longer prevent ourselves from doing it.

Evidence for the Automaticity of Social Comparisons from Studies Using Subliminal Exposure: **Do Social Comparison Processes Demonstrate the Criteria for Automaticity?**

Based on Gilbert, Giesler, and Morris' (1995) proposition that social comparison may not always be a deliberate, strategic process, Mussweiler, Ruter, and Epstude (2004) sought to test whether social comparisons may in fact be automatic. Their results indicated that subliminal

stimuli lead to social comparisons and influenced self-evaluations (Mussweiler et al., 2004). Specifically, when primed with the name of an athletically "moderate low standard" (in this case former US president Bill Clinton), individuals evaluated themselves to be less athletic than when primed with a "moderate high standard" (former race car driver, Nicki Lauda). However, when primed with an "extreme low standard" (in this study, former Pope, Pope John Paul), individuals evaluated themselves to be more athletic than when primed themselves to an "extreme high standard" (former professional basketball player Michael Jordan) (Mussweiler et al., 2004). These results seem to indicate that social comparison may in fact occur automatically, and that the extremity of the standard against which one may compare themselves, matters. Specifically, because the stimuli were briefly presented outside of conscious awareness, Mussweiler et al. seem to have shown that social comparison processes can operate unintentionally, efficiently, and without awareness.

Another study tested the effect of subliminal social comparison on self-evaluations, based on an idea from evolutionary psychology – that jealousy has evolved as an adaptive mechanism for reproduction. Researchers wanted to test whether the evaluation of potential romantic rivals is an automatic process that would occur unconsciously (Massar & Buunk, 2009). Participants were shown line drawings of forms with either an attractive or an unattractive body shape. An attractive body shape for women and men was defined to be one with a low waist-hip ratio or a high shoulder-hip ratio, respectively; unattractive body shapes for women vs. men were a high waist-hip ratio or a low shoulder-hip ratio, respectively (Massar & Buunk, 2009). After being subliminally primed with the respective body shape images, participants were asked to read and visualize a vignette situation (meant to illicit jealous responses). An example of the male-version vignette was as follows: "You are at a party with your girlfriend and you see an unfamiliar man

walk up to her. He starts flirting with her. She seems to like it, and starts flirting back". Men indicated more jealousy when primed with an "attractive" versus an "unattractive" body shape, although the same result was not shown for women (Massar & Buunk, 2009). These results do seem to lend support to the automaticity of social comparisons. However the authors suggest that some sex-specific evolutionary mechanisms, such as mate-competition, may mean that such automatic comparisons may be more present in men than in women.

Some other studies in the area of automaticity and social comparisons specifically used media images as subliminal primes. Jansen & de Vries (2002) tested women's responses to thin-ideal media images when these images were presented pre-consciously, by providing women with ultra-short exposure to them. Their hypothesis was that this pre-attentive exposure to thin-ideal images would be associated with decreased self-esteem and mood, whereas pre-attentive exposure to larger models would increase self-esteem and mood (Jansen & de Vries, 2002). They also expected to find more pronounced effects in highly restrained eaters than in low restrained eaters. Their results seemed to indicate that social comparisons do not conform to the criteria of automaticity, as there were no significant effects of the thin-ideal models on women's self esteem or mood. However, the power to detect a statistically significant effect in this study was likely low, because of the between-participants design and the relatively-small sample size, as there were 26 subjects in the highly restrained eater category, and 25 in the low retrained eater category.

A more recent study to look at the phenomenon of the automaticity of social comparisons was conducted by Chatard, Barthélémy, Selimbegovic, and Guimond (2017) in France. The researchers in this study recognized that work had previously been conducted in the field of social comparison as an automatic process, however they concluded that the support for the idea

was weak and inconclusive. Thus, using most overtly the criterion of awareness described in Payne (2012), these researchers sought to determine whether social comparisons could occur to subliminal stimuli, those that are shown below the level of conscious awareness. Specifically, they examined whether subliminal exposure to stimuli like those in thin-ideal media images affected appearance anxiety, which is a construct related to body dissatisfaction (Chatard et al., 2017). They reasoned that if their hypothesis was correct, that these subliminal stimuli did in fact have an effect, then it would provide strong evidence for the idea that social comparison occurs automatically. If people experience increased appearance anxiety after exposure to stimuli that they are not even aware of then the process must be at least somewhat automatic. Employing a between-participants design in their Experiment 1 and a within-participants design in their Experiment 2, these researchers did in fact find that exposure to thin-ideal body images increased appearance anxiety, even if the exposure occurred outside of participant's conscious awareness (Chatard et al., 2017). The results from this study seem to support the idea that social comparison can operate without awareness, and with little cognitive effort (Chatard et al., 2017).

However, before we can confidently conclude from this study that social comparisons are automatic, an independent replication of the effect is needed. Only in recent years has the need for independent and direct replications of psychology studies been fully appreciated.

Replication Crisis in Psychology

Recent controversies, such as the now famous scientific fraud case of social psychologist Dierdeik Stapel, have led to a widespread criticism of the way in which researchers conduct and analyze studies (Stroebe & Strack, 2014). In addition to cases of outright fraud, there have also been concerns raised about false positive research findings, instances in which an effect is found where it does not really exist. This may stem from the increasingly practiced "exploratory

behaviour" of researchers, wherein they may be motivated by extrinsic factors (such as publication pressure) to find a "statistically significant" result (Simmons, Nelson, & Simonsohn, 2011). Due to this, distrust in the field of psychological science, particularly as it relates to methodology, is growing (Stroebe & Strack, 2014). Chatard et al. (2017) even make mention of this in their article – they explain that research needs to be supported by concrete and robust evidence, particularly during this time of doubt in the face of social psychological research findings. Large scale attempts to replicate research findings have shown that many studies do not replicate. For instance, Nosek et al. (2015) tested 100 studies to evaluate their reproducibility. Despite using materials provided by the original study authors and high statistical power, a large portion of the replications produced weaker evidence than was found in the original papers (Nosek et al., 2015). In fact, only 36% of the replications found a statically significant result (in contrast to 100% of the original studies). Findings such as this are why the "replicability crisis" in psychology has been picking up steam. The basic idea is that if an effect found in a previous study is reliable, then a direct replication of that study should produce the same effect (Simons, 2014). After all, it is vital to "trust but verify" (Simons, 2014) the results of psychological studies, and independent corroboration of research results is the cornerstone of psychological science.

The Present Study

The present research aimed to produce a direct replication of Chatard et al. (2017)'s Experiment 2 on the effect of subliminal social comparisons on appearance anxiety. Subliminal exposure to ultra-thin media images and self-report measures designed to assess appearance anxiety were employed. Using a sample of sixty-seven female undergraduate students, the hypothesis (following Chatard et al., 2017) was that there would be a statistically significant

difference in the women's self-evaluations before and after they were subliminally exposed to thin-ideal media images. Researchers from Chatard et al.'s study made all of the stimuli from their procedure available online, and thus the present study used the exact stimuli from the original study.

Methods

Participants

A sample of female undergraduate students were recruited from an Introduction to Psychology course at Ryerson University. All participants received 0.5 of a research participation credit for taking part in the experiment, which was applied toward their final course mark. A power analysis revealed that 51 sets of data needed to be analyzed in order to stand a 95% chance of detecting an effect as large as the one reported by Chatard et al. (2017) in their second study. During the testing process, computer malfunctions and participant errors made three sets of data unusable. Therefore, while we tested seventy participants, data from sixty-seven were analyzed.

Materials

Thin-Ideal Images. During the Subliminal Affective Priming (SAP) task (described later in the Procedure section), participants were exposed to14 different media images of the female thin-ideal body, each presented twice. These were the exact same set of images used by Chatard et al. in their Study 2. The models were presented for the duration of a single screen refresh. With a monitor set to run at 85 Hz (as in Chatard et al., 2017, Study 2), this was 11.76ms, so that they were presented below participants' conscious awareness. See Appendix D-5 for a sample image. The presence of the images on the screen was confirmed both by the log-files recorded by

the presentation software, and by recording the screen with a video-camera running at 1000 frames per second.

Mask Images. In the SAP task, each thin-ideal image was preceded and followed by a scrambled version of the image (a *mask*), also presented for a single screen refresh (11.76ms) as in Chatard et al.'s study. These acted as pre- and post-masks to the subliminal image to try to ensure that it was not consciously detected. See Appendix D-6 for sample mask images.

Chinese Ideograms. Immediately following the subliminal presentation of each mask-image-mask sequence in the SAP, participants saw a Chinese ideogram. They were asked to indicate whether they "like" or "dislike" each ideogram. See Appendix D-6 for a sample ideogram image. Participants were told that rating these ideograms was the point of the SAP task. In reality, the entire task was just an excuse to subliminally present the images of thin-ideal models. Thus, the data from participants' ratings of the Chinese ideograms were not analyzed.

Measures

Body Dissatisfaction Scale. This scale was used as a moderator, and to assess a baseline level of body dissatisfaction. There were nine items, and each was rated using a 7-point Likert scale (with responses ranging from 1: "do not agree at all" to 7: "completely agree"). Some sample items are "I think that my stomach is too big", "I think that my thighs are too large", and "I like the shape of my buttocks". This is a subscale from a previously validated scale commonly used to assess Body Dissatisfaction (Eating Disorder Inventory: Garner, Olmstead, & Polvy, 1983).

Self-Monitoring Scale. This scale was used as a moderator, to assess self-monitoring. There were 25 items, and each was rated using a 7-point Likert scale (with responses ranging

from 1: “do not agree at all” to 7: “completely agree”). Some sample items are “I find it hard to imitate the behaviour of other people”, “I sometimes appear to be experiencing deeper emotions than I actually am”, and “I guess I put on a show to impress or entertain people”. This is a previously validated scale commonly used to assess self-monitoring (Snyder, 1974).

Physical Appearance State and Traits Anxiety Scale (PASTAS). The scores on this scale were the dependent variable, with higher scores representing higher levels of appearance anxiety. There were 8 items, rated on a 5-point Likert scale (with responses ranging from 1: “do not agree at all” to 5: “completely agree”). Some sample items are “Right now I feel anxious, tense or nervous about the extent to which I feel overweight”, “Right now, I feel anxious, tense, or nervous about my thighs”, and “Right now, I feel anxious, tense or nervous about my legs”. This is a previously validated scale commonly used to assess feelings of anxiety about one’s appearance (Reed, Thompson, Brannick, & Sacco, 1991).

Objective Awareness Check. During this task, participants were exposed to 20 Chinese ideograms, and informed that there was a subliminal image presented before some of the characters. Participants were asked to indicate whether they thought there was a subliminal image presented before each ideogram, by way of pressing either an “I” (for yes) or “E” (for no) computer key. There was a masked subliminal thin-ideal image present on 10 of the trials, and no such image on the 10 remaining trials. The trials were presented in a random order.

Demographic Questions. Participants were presented with three free response questions, for the purpose of attaining demographic information about the sample. The questions were presented in the following order: How old are you? With what ethnicity/ethnicities do you identify? Are you able to read Chinese ideograms?

Procedure

Participants signed up for the study through the SONA participant-management website, with the understanding that their body image was going to be assessed and that they would participate in a computer-based task. This was a 2 (between-subjects: order of blocks in the SAP task) x 2 (within-subjects: exposure to subliminal images or not) study, wherein participants were randomly assigned to one of the two conditions.

At the beginning of the 30-minute testing session, participants were asked to read and sign a consent form to ensure that they were fully informed. After being offered a chance to ask any questions they may have had and sign the consent form, participants were led to a testing room, where they were seated in front of a single computer. Participants were first asked to use the computer in front of them to complete two moderators – the 9 item "Body Dissatisfaction Scale", and the 25 item "Self-Monitoring Scale". Once completed, participants were instructed to indicate whether they "like" or "dislike" a series of Chinese ideograms presented on their screen. They completed two blocks of this SAP, with half of the participants randomly-assigned to first receive the block of trials in which the subliminal images were presented, and then the block in which the subliminal images were not presented. The other half of the participants experienced the blocks in the reverse order (first no-images, then subliminal-images). For each trial in the SAP block with subliminal images, a pre-mask image was presented for 11.76 ms, followed by the subliminally presented thin-ideal image for another 11.76ms, followed by a post-mask image for 11.76ms, followed by a Chinese ideogram. This occurred for 56 trials. For each trial in the no-images block, the thin-ideal image was replaced with a blank (white) image, for another 56 trials. After each block of the SAP, participants were asked to complete the dependent variable measure, the "Physical Appearance State and Traits Anxiety Scale", which consisted of 8 items.

Next, participants were asked to take part in an objective awareness check, wherein they needed to indicate for 20 trials whether they could detect an image briefly flashed before the presentation of a Chinese ideogram. For half of these trials, the mask-image-mask stimuli were presented, and for half of the trials they were not. After the objective awareness task, participants responded to three demographic questions.

The final step before leaving the lab was for the participants to complete a debriefing form. This form outlined the true purpose of the study – to determine the effect of subliminally presented thin-ideal images on one's appearance anxiety. Participants also had an opportunity to ask any questions they may have had, as well as to indicate whether or not they agreed to have their data included in the analysis of results. This concluded the lab visit, and participants were thanked for their participation.

If social comparisons are in fact an automatic process, we expected to replicate Chatard et al.'s findings. Higher appearance anxiety scores were expected after the SAP block in which participants were exposed to the subliminal images, compared to after the SAP block in which they were not. Thus, the PASTAS scores were analyzed with a 2 (between-participants: order of SAP blocks) x 2 (within-participants: subliminal images vs. no images block) ANOVA.

Results

Sample characteristics

Table 1 shows the sample characteristics, separately for participants who were first exposed to the thin images (order 1), and those who were first exposed to the control images (order 2). Independent samples *t*-tests showed no significant differences between the two orders

on age, body dissatisfaction, and self-monitoring. Table 1 also reports the ethnicity make-up of participants in each order (and the corresponding percentages).

Preliminary analysis

As Chatard et al. did, we first conducted a 2 (Order of SAP blocks: thin first vs. control first) x 2 (Subliminal image exposure: thin images vs. no images) mixed ANOVA, with Subliminal image exposure as a within-participants factor. The interaction between the factors was not significant, $F(1, 56) = .004$, $p = .95$, $\eta^2 < .001$. This non-significant interaction meant that, in our main analyses, we did not consider Order of presentation as a factor.

Table 1: Sample characteristics

Variable	Order 1: Thin then Control (n = 34)	Order 2: Control then Thin (n = 33)	Test statistics
Age	19.56 (2.88)	19.70 (2.51)	$t(65) = .21$, $p = .84$, $d = .05$
Body Dissatisfaction	33.26 (11.52)	36.59 (11.32)	$t(64) = 1.18$, $p = .24$, $d = .30$
Self-Monitoring Scale	104.06 (14.54)	100.97 (14.62)	$t(61) = .84$, $p = .40$, $d = .22$
Ethnicity	13 Caucasian (38.2%)	15 Caucasian (45.5%)	N/A
	8 Asian (23.5%)	5 Asian (15.2%)	
	1 Black/African-American/African-Canadian (2.9%)	3 Black/African-American/African-Canadian (9.1%)	
	4 South Asian (11.8%)	4 South Asian (12.1%)	
	1 Multi-Ethnic (2.9%)	1 Hispanic/Latina (3.0%)	
	7 No answer/not classifiable (20.6%)	1 Multi-Ethnic (3.0%)	
		4 No answer/not classifiable (12.1%)	

Main analyses

Table 2 shows the results of the main analyses. We conducted a paired-sample *t*-test on the entire sample ($n = 62$). While the mean appearance anxiety score was slightly higher in the thin-models condition than in the control condition (mean difference = 0.2), this difference was not statistically significant. We considered that those participants who indicated that they could read the Chinese characters presented in the task may have responded differently to the SAP task than those who could not. Thus, we conducted a second analysis on the sample, excluding those participants who could read the ideograms ($n = 4$). There was no significant difference detected between the thin-models and control conditions in this analysis either. Finally, in Chatard et al. (2017)'s study, only Caucasian participants were tested. Thus, we conducted a third analyses on only the Caucasian participants ($n = 26$). No significant difference in appearance anxiety scores existed. Results from each of the three analyses are reported in Table 2.

Table 2: Dependent Variables and Analyses

Participants	Appearance Anxiety: Control	Appearance Anxiety: Thin	Test statistics
Whole sample (n = 62)	2.74 (1.12)	2.76 (1.14)	$t(61) = .54$, $p = .60$, $d_z = .07$, $d_{rm} = .02$
Whole sample minus those who could read characters (n = 58)	2.75 (1.13)	2.76 (1.16)	$t(57) = .19$, $p = .85$, $d_z = .02$, $d_{rm} = .01$
White/Caucasian participants only (n = 26)	2.93 (1.11)	2.92 (1.10)	$t(25) = .22$, $p = .83$, $d_z = .04$, $d_{rm} = .01$

Awareness check

Participants reported an image was present on 53.39% (SD = 28.22) of trials when the image was present, and 40.65% (28.62) of trials in which the images were not present. A paired-sample *t*-test revealed that the hit and false alarm rates were statistically different, $t(61) = 4.62$, $p < .001$, $d_z = .59$, $d_{rm} = .45$.

Discussion

Several studies have tested the proposition that social comparison may be an automatic process, with varying results. For instance, Mussweiler et al. (2014) found that social comparisons occur after subliminal exposure to "low" versus "high" standards, and that these comparisons influence self-evaluations. Additionally, a study conducted by Massar and Buunk (2009) also provided support for the automaticity hypothesis, finding that priming participants with sex-specific unattractive and attractive body shapes led to unconscious rival evaluations and social comparison. However, there have also been studies that have not found such an effect of subliminal exposure to images on explicit self-evaluations. For instance, Jansen and De Vries (2002) exposed women to thin-ideal images and found no significant effect of the thin-ideal models on the women's self-esteem or mood.

In the current study, we attempted to replicate an experiment conducted by Chatard et al. (2017). Researchers in this study found that subliminal thin-ideal stimuli affected participants' explicit self-evaluations. They concluded that because the thin-ideal images had an effect on appearance anxiety ratings, this provided evidence for the idea that social comparison occurs automatically. Our approach to this replication study was cautious, not only because previous

evidence in this area is mixed, but also because of the importance in recent years of conducting replication studies.

Using the methods and materials from Chatard et al. (2017)'s study, we did not replicate their finding that appearance anxiety scores differed significantly between the thin-image condition and the control/no model condition. Subliminal exposure to thin-ideal images did not significantly affect participants' appearance anxiety ratings. While average appearance anxiety scores in the thin-image condition (M = 2.76) were slightly higher than scores in the control condition (M = 2.74), this difference was very small and statistically non-significant.

There may have been several reasons why our results differed from those of Chatard et al. One reason that we considered was that while Chatard et al. tested only Caucasian participants in their sample, we tested a more diverse sample of women (see Table 1). We considered the possibility that this may have affected women's susceptibility to being influenced by the thin-ideal images, especially given that they were all images of Caucasian women. There are two possible explanations for why only Caucasian might show evidence of automaticity in social comparisons using Chatard et al.'s methods. Firstly, perhaps Caucasian women habitually make more social comparisons based on appearance than women of other ethnic groups. If automaticity is something that only develops if a mental process is repeatedly carried out (just as reading only becomes automatic after you have done it for long enough), then perhaps only Caucasian women have automatized the process of social comparison. Secondly, perhaps everyone can engage in social comparisons automatically, but only with people considered to be in one's in-group. Both of these speculations might explain why only Caucasian women would show evidence of automaticity in social comparisons with Chatard et al.'s methods. However, we ran an analysis on only data from the Caucasian women in our study, and there was no

significant effect found of the thin-ideal images on women's level of appearance anxiety. While mean scores for appearance anxiety were higher in Caucasian women than in the overall sample (by 0.19 in the control condition, and 0.16 in the thin condition), the difference between thin and control groups was not statistically significant when considering only the Caucasian women. That said, it is possible that we did not detect an effect because of the very low sample size that resulted once we excluded data from all non-Caucasian participants (n = 26).

A second possibility for the non-significant effect in our study could have been differences in cultural context between the group of women tested in the original study and the group of women in ours. The women in Chatard et al.'s study resided in France, and thus it is possible that differences in cultural context made the French women more susceptible to the detrimental effects of exposure to the thin-ideal images. Perhaps the high volume of such images in the Canadian (particularly Torontonian) context, led our participants to be desensitized to the images that we presented to them, and thus not engage in social comparisons with them. However, it is difficult to assess differences in thin-ideal image rates in France versus Canada. Additionally, there was nothing identifiably "French-specific" about any of the thin-ideal images, as they resemble many of the images present in Canadian advertisements. Thus, there is no legitimate reason to suspect that the images presented in the study would affect French women but not Canadian women.

It has, however, been suggested that there are differences in relationships between body image and correlates in French body image measures compared to North American ones (Rodgers et al., 2016). One study tested the psychometric properties of the *Sociocultural Attitudes Toward Appearance Questionnaire*, a measure previously discussed as important in the assessment of internalization of the thin-ideal. This study tested the validity and reliability of the

measure with French men and women, indicating the importance of examining body image and its related factors from a culturally-specific perspective in French samples (Rodgers et al., 2016). While Chatard et al.'s study indicated use of the French version of the body dissatisfaction and self-monitoring scales, researchers did not indicate using the French version of the *Physical Appearance State and Trait Anxiety Scale* (dependent measure), or validating it for use in French samples (Chatard et al., 2017). The PASTAS scale was developed at the University of South Florida (Reed et al., 1991), and thus another possibility for the discrepancies in our results could be that Chatard et al. did not accurately measure appearance anxiety rates in their sample, because their measure was not validated for use in this specific sample.

It is also possible that a ceiling effect occurred. The "ceiling effect" refers to the potential for participants to answer highly on every question on a given test, because of the limits of the measure (Wang et al., 2008). For instance, in this case, a substantial proportion of participants answering 5 on the appearance anxiety scale items would be evidence of a ceiling effect. When this effect occurs, the true scores of those high scoring participants may be difficult to accurately determine. In the current study, while the mean appearance anxiety scores were higher than those in Chatard et al.'s study (by 0.39 in the thin condition, and 0.48 in the control condition), they were still significantly lower than the maximum possible score on the anxiety scale of 5. Thus it is unlikely that a ceiling effect occurred in our study.

Lastly, it is possible that the significant effect of thin-ideal images on appearance anxiety reported in Chatard et al.'s study was a false positive (or type I error). Citing Ionnadis (2005), Stroebe (2016) suggests that a result is false when it cannot be replicated – suggesting that the original effect did not in fact exist. This type of result could occur because of statistical problems like lack of power (the capability to identify valid hypotheses), or because of a confounding

variable that researchers did not consider. However, our finding of no significant effect does not mean for certain that Chatard et al.'s finding was a false positive, as even mass replication projects, such as the Open Science Collaboration, caution that the failure to replicate an effect can also mean that there was insufficient power or design problems with the replicating study (Stroebe, 2016).

Awareness Check

Participants in both studies completed an objective awareness check at the very end of their visit to the lab, in order to test for their awareness of the subliminally presented stimuli. In our study, participants reported that an image was present on 53.39% of trials when the image was present, and 40.65% of trials on which the images were not present. A paired-sample *t*-test revealed that the hit and false alarm rates were statistically different. This result differs from that found in Chatard et al's study. Their awareness check results indicated that participants reported that a subliminal image was presented before the ideograms on 21.37% of trials when there was a subliminal image, and on 22.06% of trials when there was no subliminal image. Their hit and false alarm rates were not statistically significant. It is therefore possible that the awareness that participants seemed to display for the images in our study, contributed to the lack of effect of the images. However, this seems unlikely, as the typical response to consciously seeing thin-ideal images is an increase in body dissatisfaction and appearance anxiety (Grabe et al., 2008) whereas we found no such increase after exposure.

Limitations and Future Research

A limitation of our study is that it only analyzed data from sixty-seven participants, which meant that the power to detect a significant effect was low. Moreover, this limitation is

particularly acute when it comes to drawing conclusions from our Caucasian sample, which consisted of only twenty-six women. A larger sample should be analyzed in order to be strictly comparable to Chatard et al.'s results, which only included Caucasian participants. Future studies should only test women who self-identify as Caucasian, and should include a larger sample size.

Additionally, our finding that participants displayed considerably more awareness of the subliminal images than Chatard et al.'s sample may question the genuine "subliminal" presentation of these images. Future studies should employ differing methods to test for subliminal effects.

Overall, the results in the area of the automaticity of social comparison processes, as well as the effect of these processes on self-evaluations have been inconclusive. Several studies have found conflicting results about whether social comparisons occur automatically. Though this study was a replication, it found considerably different results from Chatard et al.'s study. This area of research would benefit from future studies with a focus on evidence for social comparisons in a sample of women who are particularly likely to make them. Since research has indicated that internalization of the thin-ideal makes women susceptible to comparison with thin-ideal images, automatic social comparisons may be detected more easily in a sample with high thin-ideal internalization.

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List of Appendices (A-D)

Appendix A: SONA Ad

Body Image and Satisfaction Survey

Abstract This is a social psychology study. It consists of a 30 minute visit to the lab in the SBB involving the completion of a series of scales related to your body satisfaction, self monitoring, and appearance anxiety.

Description In this study we are investigating body image perception. We are looking to collect 51 usable sets of data. Thus, more than 51 participants may initially be recruited. Participants will be students enrolled in either PSY102 or PSY202 at Ryerson University. If you choose to participate, you will make one 30-minute visit to the labs at 105 Bond Street (the South Bond Building). Upon arrival at 105 Bond Street, please take the stairs up one flight and go through the double-doors. Take a seat in the waiting area, where the researcher will come to meet you. In case of difficulties, the lab extension is 4986. Please call 416-979-5000 x 4986 to be let into the building after 6pm on weekdays or on weekends. During the individual lab session, you will complete one scale ranking your degree of dissatisfaction (or lack thereof) with multiple parts of your body. This will be followed by a self-monitoring scale, where you indicate how you typically react to a number of social situations. Furthermore, you will asked to indicate your preference (or lack thereof) for 56 Chinese ideograms (symbols). This will be followed by completing an appearance anxiety scale, another set of 56 Chinese ideogram rankings, and another appearance anxiety scale. Lastly, you will complete a final Chinese ideogram task - this one only involving 20 characters. You will also be asked a few demographic questions about yourself. When you have finished taking part, you will have an opportunity to ask questions and to learn more about the study. By taking part in this study, you may learn more about the process of psychological

	research. Some of the questions involved in the study may be somewhat personal, and you may experience some minor discomfort. However, your answers to these questions will be confidential and you do not have to answer any question you do not want to. You may also discontinue your participation at any time and you will still receive your research credit.
Duration	30 minutes
Credits	0.5 Credits
Researcher	Krischanda Bemister Email: **kbemiste@ryerson.ca**
Principal Investigator	Stephen Want Email: **swant@ryerson.ca**
Study Status	Approved
REB Approval Code	#Thesis 18-8

Appendix B: Consent Form

Ryerson University
Consent Agreement
Body Image and Satisfaction Survey

You are being asked to participate in a research study. Before signing this consent form, it is important that you read the following information. You may ask as many questions as necessary to be sure that you understand what the study entails.

Investigators: This research study is being conducted by (1) Dr. Stephen Want, Associate Professor, Department of Psychology, Ryerson University, Toronto, (2) Krischanda Bemister, BA Thesis Student, Department of Psychology, Ryerson University, Toronto.

Purpose of the Study: The purpose of this social psychology study is to examine female students' body image perceptions. We aim to collect 51 usable sets of data from female students at Ryerson enrolled in PSY 102/202. More than 51 participants may be recruited because things like computer errors sometimes mean that we cannot use some people's data. The results of this study will contribute to the completion of Krischanda Bemister's undergraduate thesis.

Description of the Study: If you decide to participate in the research, your visit will last approximately 30 minutes. During your visit, you will be asked to do the following:

(1) Read and sign a consent form (approximately 3 minutes).
(2) Complete a short questionnaire assessing your body image. For instance, you will be given a statement such as "I think my stomach is too big", and asked to rate this statement on a scale from "do not agree at all" to "completely agree" (approximately 2 minutes).
(3) Complete a questionnaire assessing your reactions to variety of social situations. For instance, you will be given the statement "I find it hard to imitate the behaviour of others", and asked to rate this statement on a scale from "do not agree at all" to "completely agree" (approximately 4 minutes).
(4) Engage in a computer administered task where you will view 56 Chinese ideograms and asked to indicate whether you "like" or "dislike" each one (approximately 5 minutes).
(5) Complete a short questionnaire in which you rate your anxiety towards certain body parts. For example, you will be given the statement "Right now, I feel anxious, tense, or nervous about my legs", and asked to rate this statement on a scale from "do not agree at all" to "completely agree" (approximately 2 minutes).
(6) Engage in a second version of the computer administered task where you will view 56 Chinese ideograms and are asked to indicate whether you "like" or "dislike" each one (approximately 5 minutes).
(7) Re-complete the short questionnaire in which you rate your anxiety towards certain body parts. (approximately 2 minutes)
(8) Complete a final Chinese ideogram task testing your objective awareness (approximately 2 minutes).
(9) Answer a few demographic questions about yourself (approximately 2 minutes).

Due to the nature of this study, you cannot be informed of the entire purpose of the experiment at the present time. However, at the end of the study, you will be debriefed and told exactly what the hypotheses

of the study are, and will have another opportunity to ask questions about the study. This will take approximately 5 minutes. It is therefore expected that your participation in this study will take about 30 minutes in total. Each person will take part in the study individually. Research findings will be made available to participants in April of 2018, where they will be presented during the undergraduate poster presentation session. (Please note, the results will be presented as averages only; no-one's individual responses to questions will be individually identifiable when the results are presented.)

What is Experimental in this Study: None of the procedures or questionnaires used in this study is experimental in nature, in the sense that they have all been used by other researchers and found to be useful procedures and questionnaires. From a technical or procedural point of view, part of this study is considered "experimental", because by following the procedure described above, the study examines the impact of one variable (called the "independent variable") on another variable (called the "dependent variable"). More information about the independent and dependent variables will be provided at the end of the session.

Risks or Discomforts: This is a minimal risk study. However, some individuals may experience temporary discomfort due to the personal nature of some of the questions. An additional risk is temporary boredom and discomfort resulting from computer usage. Participants may choose to refuse to participate in any aspect of the research (e.g., responding to questionnaire items). Any discomfort you may experience is expected to be temporary and not greater than you might experience in a typical day. If any aspect of this study makes you feel uncomfortable, you may temporarily or permanently discontinue your participation and still receive your participation credit.

Benefits of the Study: There is no direct benefit to participants in this study. However, the information gained from the overall study may improve future psychological research in the area of social psychology, specifically as it relates to body image perceptions of women. When the session is over, we will describe the purpose and hypotheses of the study to you in more detail.

Confidentiality: You will not put your name or student number on the questionnaires or other study materials. You will be asked to sign only this consent form (if you decide to participate), and it will be filed separately from your data. Your responses in this research will be kept confidential and there will be no way of linking your responses with your identity.

Incentives to Participate: You will receive 0.5 participation credits to use towards your PSY 102/202 course at Ryerson. If you would prefer to 'walk through' the study (that is, if you would like to observe the research process but not provide any personal data), you will still be given the 0.5 credit assuming you have not already received the maximum allotted for research participation in a given term.

Voluntary Nature of Participation: Participation in this study is voluntary. Your choice of whether or not to participate will not affect your grades or academic status. If you decide to participate, you are free to withdraw your consent and to stop your participation at any time without penalty or loss of benefits to which you are allowed. Should you withdraw from the study, you will still be given your 0.5 credit.

Data Storage and Dissemination of Results: The data from this study will be held on a password protected computer in the locked lab of Dr. Stephen Want. Only investigators and associated personnel will have access to this data. Consent forms will be held in a locked filing cabinet in the lab of Dr. Want.

After this period, the anonymized data will be kept indefinitely. Consent forms will be destroyed after data collection has completed. It is possible that a third party (e.g., graduate students, senior undergraduate students) may have access to the anonymized data for a purpose that was not originally

identified in this study. As well, results may be shared with others at scholarly meetings or as part of published papers. However, all information will be presented in aggregate form. That is, none of your individual information will be identifiable in any way. Anonymized data may be provided to other researchers for the purpose of study or verification of results; any data that is shared will NOT include the names or other identifying information of ANY participants.

Data collected during each session will be stored anonymously, and thus it will not be possible to remove your data from the study once the session has concluded. A debriefing form provided to you at the end of your visit will allow you to decide whether or not you would like your data include in the results of the study.

Questions about the Study: If you have any questions about the research now, please ask. If you have questions later about the research, you may contact: Dr. Stephen Want (swant@ryerson.ca) or Krischanda Bemister (kbemiste@ryerson.ca)
If you have any questions regarding your rights as a human subject and participant in this study, you may contact Psychology Research Ethics Committee, c/o reb@psych.ryerson.ca]

If completing any of these measurements raises concerns that you would like to discuss, please contact the: Centre for Student Development and Counselling (CSDC), Ryerson University Jorgenson Hall (JOR-07C) 416-979-5195 csdc@ryerson.ca

If you any have questions about receiving your Psychology 102/202 credit for participation, please contact: thepool@psych.ryerson.ca

Agreement: Your signature below indicates that you have read the information in this agreement and have had a chance to ask any questions you have about the study. Your signature also indicates that you agree to be in the study and have been told that you can change your mind any time during the study and withdraw from it. You have been given a copy of this agreement.

You have been told that by signing this consent agreement, you are not giving up any of your legal rights.

_____

Name of Participant (please print)

_____ _____

Signature of Participant Date

_____ _____

Signature of Investigator Date

Appendix C: Debriefing Form

Debriefing

At the beginning of this study, we told you that we were interested in learning more about female students' body image, or how you feel about different aspects of your body. However, this was not the only purpose of the study. We had to disguise the specific purpose of the study because if you had known the entire purpose of the study before participating, that knowledge may have influenced your behavior in the study. As you will have learned in your Introductory Psychology class, participants often have to be kept unaware (or "blind") to a study's purpose in order to avoid changing the behavior that is being studied.

The exact purpose of this study was to determine if very briefly-presented images of "thin-ideal" women can affect women's anxiety about their own appearance. Previous research has shown that one of the greatest predictors of body dissatisfaction is upward social comparison. Upward social comparison is the tendency to compare ourselves to others whom we feel are superior to us in some way. Mass media appears to play a role in this comparison process, in that they often present images of very thin and attractive women ("thin-ideal" images). Studies show that seeing mass media images depicting the thin-ideal seems to cause most women to feel worse about their own appearance. However, one thing that is currently unknown is how much conscious mental effort it takes for us to compare ourselves to other people. To test the idea that social comparisons may occur automatically, without any conscious mental effort, a group of researchers in France conducted a *subliminal exposure* study. They wanted to see whether exposing women to images of thin-ideal media models so quickly that the images are not even consciously seen would influence their ratings of their appearance anxiety immediately afterwards. They found that appearance anxiety ratings were in fact greater following the subliminal exposure to thin-ideal images.

This study is a replication study. This means that we are seeking to independently replicate the findings that subliminally presented media images of thin-ideal images are associated with increased appearance anxiety.

In this study, one group of participants looked at the Chinese ideograms and were subliminally primed with images of thin-ideal models during the first round of presentation, but not during the second. This means that the images were presented so quickly that you may not have consciously seen them (for 11ms, to be specific). A second group of participants were subliminally primed during the second Chinese ideogram presentation round, but not during the first. If social comparison occurs automatically and without conscious effort, then we should find that we report more appearance anxiety after being

subliminally exposed to the thin-ideal images than after not being exposed to them. If social comparison is not an automatic process, than we will likely see no significant difference between the appearance anxiety scores.

So, the independent variable (the thing we manipulated) in this study was whether or not participants were exposed to the subliminal images or not. The dependent variable (the thing we measured) was the participants appearance anxiety ratings afterwards.

Thank you again for participating in this study. Please remember that your participation in this study is confidential and that we will not discuss your participation or results with anyone, nor identify you by name in any written report from this study! Also, remember that you have the option to withdraw your data from the study now, should you wish to.

Now that you know the precise purpose of the study, please tick the box below that indicates whether or not you are willing to have your data included in the study. Then, sign on the line below.

☐ I consent to having my data included in the study.

☐ I DO NOT consent to having my data included in the study.

_____

Name of Participant (please print)

_____ _____

Signature of Participant Date

If you would like a copy of this debrief, please let the researchers know at this time.

Please see:

Chatard, A., Bocage-Barthelemy, Y., Selimbegovic, L., & Guimond, S. (2017). The woman who wasn't there: converging evidence that subliminal social comparison affects self-evaluation. Journal of Experimental Social Psychology, 73, 1-13. doi:10.1016/j.jesp.2017.05.005.

to read more about the study that we are replicating.

Please see:

Grabe S., Hyde, J.S., & Ward, L.M. (2008). The role of the media in body image concerns among women: a meta-analysis of experimental and correlational studies. *Psychological Bulletin*, 134(3), 460-476. Doi: 10.1037/0033-2909.134.3.460.

to learn more about the potential role of the media in body image concerns amongst women.

If looking at the images in this study or reflecting on your feelings about your own appearance has raised any issues that you would like to explore further there is a confidential counseling centre available to students on campus. Its services can be accessed through the web at **http://www.ryerson.ca/counselling/** In addition, there are excellent web-based resources focusing on media portrayals of women and body image concerns that are accessible here: **http://www.ourbodiesourselves.org/health-topics/body-image/**

If you know other people who are going to participate in this research (perhaps other people from your intro psych class), ***please don't talk to them about the study until after they have participated***. It is important for our study that people participate in it without knowing what the real purpose of the study is.

This study was approved by the Psychology Ethics Committee. To contact the PEC please email **reb@psych.ryerson.ca.** To contact psychpool, please email **thepool@psych.ryerson.ca.** If you have any additional questions, please feel free to ask us at this time, or you may email us after your session at **kbemiste@ryerson.ca** (Krischanda Bemister) and/or **swant@ryerson.ca** (Dr. Stephen Want). Thanks again!

Appendix D: Questionnaires/Stimuli

(1) Demographic Questions (free response)

How old are you? _____

With which ethnicity (or ethnicities) do you identify? _____

Are you able to read Chinese ideograms? _____

(2)Body Dissatisfaction Scale

Instructions: Score each statement using a scale of 1 to 7, with 1 indicating "do not agree at all" and 7 indicating "completely agree". Circle your responses on the scale provided to the right of each question.

	"do not agree at all"						*"completely agree"*
1. I think that my stomach is too big.	1	2	3	4	5	6	7
2. I think that my thighs are too large.	1	2	3	4	5	6	7
3. I think that my stomach is just the right size.	1	2	3	4	5	6	7
4. I feel satisfied with the shape of my body.	1	2	3	4	5	6	7
5. I like the shape of my buttocks.	1	2	3	4	5	6	7
6. I think my hips are too big.	1	2	3	4	5	6	7
7. I think by buttocks are too large.	1	2	3	4	5	6	7
8. I think that my thighs are just the right size.	1	2	3	4	5	6	7
9. I think that my hips are just the right size.	1	2	3	4	5	6	7

(3) Self-Monitoring Scale - *INSTRUCTIONS The statements below concern your personal reactions to a number of situations. It is important that you answer as frankly and as honestly as you can. Score each statement using a scale of 1 to 7, with 1 indicating "do not agree at all" and 7 indicating "completely agree". Circle your responses on the scale provided to the right of each question.*

THE SCALE	*"do not agree at all"*						*"completely agree"*
1. I find it hard to imitate the behavior of other people.	1	2	3	4	5	6	7
2. My behavior is usually an expression of my true inner feelings, attitudes, and beliefs.	1	2	3	4	5	6	7
3. At parties and social gatherings, I do not attempt to do or say things that others will like.	1	2	3	4	5	6	7
4. I can only argue for ideas I already believe.	1	2	3	4	5	6	7
5. I can make impromptu speeches even on topics about which I have almost no information.	1	2	3	4	5	6	7
6. I guess I put on a show to impress or entertain people.	1	2	3	4	5	6	7
7. When I am uncertain how to act in a social situation, I look to the behavior of others for cues.	1	2	3	4	5	6	7
8. I would probably make a good actor.	1	2	3	4	5	6	7
9. I rarely need the advice of my friends to choose movies, books, or music.	1	2	3	4	5	6	7
10. I sometimes appear to others to be experiencing deeper emotions than I actually am.	1	2	3	4	5	6	7
11. I laugh more when I watch a comedy with others than when alone.	1	2	3	4	5	6	7
12. In a group of people I am rarely the center of attention.	1	2	3	4	5	6	7
13. In different situations and with different people, I often act like very different persons.	1	2	3	4	5	6	7
14. I am not particularly good at making other people like me.	1	2	3	4	5	6	7
15. Even if I am not enjoying myself, I often pretend to be having a good time.	1	2	3	4	5	6	7
16. l'm not always the person I appear to be.	1	2	3	4	5	6	7

17. I would not change my opinions (or the way I do things) in order to please someone else or win their favor.	1	2	3	4	5	6	7
18. I have considered being an entertainer.	1	2	3	4	5	6	7
19. In order to get along and be liked, I tend to be what people expect me to be rather than anything else	1	2	3	4	5	6	7
20. I have never been good at games like charades or improvisational acting.	1	2	3	4	5	6	7
21. I have trouble changing my behavior to suit different people and different situations.	1	2	3	4	5	6	7
22. At a party, I let others keep the jokes and stories going.	1	2	3	4	5	6	7
23. I feel a bit awkward in company and do not show up quite so well as I should.	1	2	3	4	5	6	7
24. I can look anyone in the eye and tell a lie with a straight face (if for a right end).	1	2	3	4	5	6	7
25. I may deceive people by being friendly when I really dislike them.	1	2	3	4	5	6	7

* note: the original scale uses a T/F scoring method; however a 7 point scale is being used for this study, in accordance with our replication of Chatard et al. (2017)'s study.

(4) Body Appearance Anxiety Scale

Physical Appearance State and Traits Anxiety Scale (PASTAS)

Instructions: Score each statement using a scale of 1 to 5, with 1 indicating "do not agree at all" and 5 indicating "completely agree". Circle your responses on the scale provided to the right of each question.

Right now, I feel anxious, tense, or nervous about:

	"do not agree at all"				*"completely agree"*
1. *The extent to which I feel overweight*	1	2	3	4	5
2. *My thighs*	1	2	3	4	5
3. *My buttocks*	1	2	3	4	5
4. *My hips*	1	2	3	4	5
5. *My stomach*	1	2	3	4	5
6. *My legs*	1	2	3	4	5
7. *My waist*	1	2	3	4	5
8. *My muscle tone*	1	2	3	4	5

*note: original scale contains 16 items and is rated on a scale of 0 to 4. We will be using only the first 8 items, and rating on a scale of 1 to 5, in accordance with our replication of Chatard et al. (2017)'s study.

(5) Sample "thin-ideal" media image stimuli

(6) Design Layout for the Subliminal Affective Priming Task ("Chinese ideogram" task)