

ADD TO CART: AN INVESTIGATION OF THE EFFICIENCY OF SOCIAL
COMPARISONS TO THIN-IDEAL IMAGES IN THE CONTEXT OF ONLINE SHOPPING

by

Alyssa Nicole Saiphoo

Honours Bachelor of Science, University of Toronto, June 2015

A thesis presented to Ryerson University

in partial fulfillment of the
requirements for the degree of

Master of Arts

in the program of

Psychology

Toronto, Ontario, Canada, 2017

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Master of Arts, 2017

Alyssa Nicole Saiphoo

Psychology

Ryerson University

Abstract

Recently, researchers have investigated the cognitive efficiency of social comparisons young women make to thin-ideal images. However, results have been mixed and methodology problematic (e.g. low ecological validity, lack of consideration for ethnicity). The purpose of the present study was to address these issues. Ninety-six Caucasian undergraduate females were exposed to thin-ideal images. These images were presented in the context of an online shopping experience, to create a more ecologically valid context. To investigate cognitive efficiency, cognitive load was manipulated by having participants memorize the colours of the models' clothing items. Participants did not experience a decrease in appearance satisfaction when under high cognitive load, suggesting inefficiency. In contrast, an observed increase in negative mood under high load conditions may suggest efficiency. However, potential alternative explanations for this latter result include the non-specificity of the mood measure, the context the images were presented in, and task difficulty.

Acknowledgements

This project would not have been possible without my advisor, Dr. Stephen Want. Thank you for your guidance, support, and patience over the last two years. I'm looking forward to the next four! I would also like to acknowledge the members of my examining committee, Dr. Eric Hehman and Dr. Kristin Vickers. Your insights and contributions to this project are greatly appreciated.

And last but in no way least, to my parents and sister, Shiraz, Bibi, and Sabrina Saiphoo: I would not have gotten to this point if it wasn't for your unconditional love and support. This next degree is the last one, I promise!

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Introduction

Making comparisons between ourselves and others is a seemingly pervasive tendency that humans have. For example, in diary studies female undergraduates report comparing themselves to others, most often in terms of physical appearance, between one to two times a day (Leahey, Crowther & Mickelson, 2007; Patrick, Neighbors & Knee, 2004). This process is commonly referred to as social comparison (Festinger, 1954). People compare themselves not only to people they personally know, but also to people presented in the mass media (for example on TV, in movies, and in magazines). In 21st century Western culture, the media is more pervasive than it has ever been; it's difficult to go anywhere without encountering some sort of media image, like those of unrealistically thin and attractive celebrities and models (often referred to as thin-ideal images). Research has thoroughly investigated the effects of social comparisons to this type of image, and has reliably found that they can be detrimental to female body image (see Ferguson, 2013; Grabe, Ward & Hyde, 2008; Groesz, Levine & Murnen 2002; Want, 2009 for meta-analyses). While research seems to point to consistent effects of social comparisons with thin-ideal imagery, little research has so far addressed the automaticity – or otherwise – of these processes. It has often been suggested that social comparisons with media images are automatic in the sense of requiring few cognitive resources (i.e. they are cognitively efficient), but research has only recently begun to explicitly address this issue. Evidence that these comparisons are actually less efficient has begun to emerge, but is not yet conclusive. The following thesis presents a study with the aim of furthering the debate on the efficiency of social comparisons to thin-ideal media images.

Social Comparison Theory

In a now seminal paper, Leon Festinger posited that humans have an inherent drive to make comparisons to others, stemming from the twin goals of having opinions that coincide with those of their in-group, and calibrating their view of their own personal qualities. He termed this phenomenon social comparison. As the theory goes, individuals will try to compare their abilities and personal characteristics to objective criteria where possible, but objective criteria are not always available. In these cases, relative criteria, like the abilities and characteristics of other individuals, become the target of comparisons (Festinger, 1954).

Subsequent research on social comparison theory has differentiated between types of social comparisons depending on who the target of comparison is. On one hand, a comparison that is made to an individual whom we believe to be worse off than ourselves is called a downward social comparison (Wills, 1981). On the other hand, there are upward social comparisons; comparisons that we make to others whom we believe to be superior to us (Wheeler, 1966). Individuals may be more likely to make upward comparisons in situations involving motivation for improvement or achievement (Major, Testa, & Blysm, 1991). For this reason, upward social comparisons can be self-enhancing, meaning that they can increase the positivity of self-views by showing us how we can improve, and that improvement is plausible since we are not all that different from our superiors after all (Collins, 1996; Wheeler, 1966). However, there is also evidence that making a comparison to a superior other can be self-deflating (Marsh & Parker, 1984; Morse & Gergen, 1970; Salovey & Rodin, 1984).

How is it possible for upward comparisons to have both self-enhancing and self-deflating effects? Some have suggested that the affective consequence of a social comparison is independent of its direction (Buunk, Collins, Taylor, VanYperen, & Dakof, 1990). In some

cases, individuals might assimilate to a superior target, or see themselves as similar to the target, thus resulting in self-enhancing effects. On the other hand, individuals might contrast their abilities to those of a superior target, seeing themselves as different from the target, and self-deflating effects will be experienced. Whether assimilation or contrast occurs seems to depend on the level of similarity between the individual and the comparison target. If the target is just slightly superior to the individual, assimilation and self-enhancement are likely to occur, whereas if the target is extremely superior to the individual, contrast and self-deflation are likely to occur (Morse & Gergen, 1970; Mussweiler, Rüter, & Epstude, 2004).

Social comparison research has expanded greatly since the establishment of these basic principles (Wood, 1989). However, one issue that has received comparatively little interest to date is whether social comparison is an automatic or controlled process.

Cognitive efficiency of social comparisons. One highly influential theory of automatic and controlled mental processes comes from Bargh (1994). In a paper with the same title, Bargh proposed that there are “four horsemen of automaticity”. The first is *awareness*, referring to the individual being unaware that a mental process is ongoing. An absence of awareness could be defined in a number of ways: a person could be unaware of the stimulus that initiates the mental process, unaware of the interpretation of the stimulus by the mental process, or unaware of the resulting influence of the stimulus on their behaviour. The second horseman is *intentionality*, which refers to the initiation of the mental process being out of the individual’s control. The third is *efficiency*, meaning that the process does not require a significant amount of cognitive resources. The final horseman is *control*, which means that the individual is typically unable to halt the mental process once it has begun.

Most existing research on the automaticity of social comparisons has focused specifically on the efficiency aspect. On a broad theoretical level, some have suggested that social comparisons serve the goal of cognitive efficiency, in that comparing the self to others can be thought of as a cognitive shortcut to obtaining an accurate self-evaluation of one's opinions and abilities (Beer, Chester, & Hughes, 2013). Such comparisons probably take less time and effort than gathering more objective information about one's beliefs and abilities. Nevertheless, whether or not individual acts of social comparison are cognitively efficient is a separate issue.

The particular cognitive efficiency of a mental process, in terms of the mental resources it demands, is difficult to establish directly, and so efficiency is instead typically inferred indirectly from behaviour (Strack & Deutsch, 2015). One way that the cognitive efficiency of a process can be inferred is through the manipulation of cognitive load. In theory, a process that occurs even under taxing cognitive conditions would be efficient because this implies that only the few remaining untaxed cognitive resources are needed to complete it. A process that cannot occur under cognitively taxing conditions, on the other hand, would be considered relatively more inefficient, since the few remaining untaxed cognitive resources are not enough to complete the task. Different manipulations of cognitive load that have been used include asking participants to perform mental operations while engaged in a parallel task such as remembering complex number sequences (Gilbert & Hixon, 1991; Naveh-Benjamin & Jonides, 1984), or simply engaging a cognitive process while under a tight time constraint (Beer & Hughes, 2010).

One particular study by Gilbert, Giesler, and Morris (1995) used this logic to test the efficiency of social comparisons. Participants were asked to perform a task and exposed to the superior performance of another person on that same task. However, this target person was inappropriate for comparison because they had been given special advantages which were not

given to the participant; comparison with the target thus provided no real diagnostic information about the participants' ability at the task. When under high cognitive load – but not under low cognitive load – participants engaged in the comparison anyway, as indexed by reduced perceptions of their own ability. This is evidence that social comparisons can occur automatically and efficiently. This additionally indicates that the efficiency of social comparisons can sometimes lead to comparisons with others whose abilities are, or at least theoretically should be, irrelevant to judgments regarding our own (Gilbert et al., 1995).

Social Comparisons to Thin-Ideal Images

One real-world application of social comparison theory concerns social comparisons that are made to idealized images in the media. Western societies are saturated with these images (Brown & Dittmar, 2005; Buote, Wilson, Strahan, Gazzola, & Papps, 2011). For women, the ideal appearance is represented by the supermodels who grace the covers of magazines and billboards; tall, slender, with impeccable skin, flawless hair, and a small waist-to-hip ratio. Over the years, this ideal has become thinner and thinner, as depicted in the type of images we see in magazines and television (Malkin, Wornian, & Chrisler, 1999; Wiseman, Gray, Mosimann, & Ahrens, 1992). Analyses of Playboy centerfold models, and both Miss America contestants and winners, have found that their average weight and body mass index (BMI) has decreased since the 1970s (Garner, Garfinkel, Schwartz, & Thompson, 1980; Sypeck et al., 2006). This phenomenon has been of particular interest since these changes in idealized media have coincided with an increase in the prevalence of eating disorders, suggesting to some (Hoek & Van Hoeken, 2003) that there may be a relationship between the two. Although there is virtually no direct evidence to support a link with eating disorders, research has shown that exposure to thin ideal media images can result in decreases in positive mood, increases in negative mood,

and increases in appearance dissatisfaction (Groesz et al., 2002; Grogan, Williams, & Conner, 1996; Hawkins, Richards, Granley, & Stein, 2004; Stice & Shaw, 1994).

Social comparisons that female viewers make with these media images, comparing their own appearance with the women in the images, are generally proposed as the mechanisms for the detrimental effects (Richins, 1991; Stice & Shaw, 1994). In one study (Tiggemann & McGill, 2004), social comparisons were prompted by exposing participants to magazine advertisements and having them rate themselves on items like “I would like my body to look like this woman’s body”, or “this woman is thinner than me”. Participants in other conditions were also exposed to magazine advertisements, but were either prompted to focus on the appearance of the models in the images (but not make comparisons), or focus on the qualities of the advertisement (i.e. things like the layout, and how creative the ad was). Participants’ mood and appearance satisfaction were measured pre- and post-exposure. Results indicated that those prompted to make social comparisons had the highest negative mood scores compared to those with appearance focused or ad-feature focused prompts. To further support the idea that social comparison is the mechanism for the negative consequences of viewing thin-ideal media images, this study also showed that the amount of comparison that participants reported engaging in (regardless of the type of prompt they were given) partially mediated the relationship between image exposure and negative mood, and between image exposure and appearance satisfaction. Follow-up studies have found that it is the comparison to these images specifically on appearance dimensions, not on other dimensions such as intelligence, that is responsible for these effects (Tiggemann & Polivy, 2010). Similar results have been found with the same methodology using thin-ideal images from music videos (Tiggemann & Slater, 2004) and television commercials (Cattarin, Thompson, Thomas, & Williams, 2000).

Cognitive efficiency of social comparisons to idealized images. Having established that social comparisons are likely to be the mechanism by which thin-ideal media images exert detrimental effects on female viewers, researchers have begun to probe the specific properties of those social comparisons. Recent attention has focused on the question of their cognitive efficiency. As previously mentioned, thin-ideal media images saturate our society (Buote et al., 2011) and comparisons to them are frequent (Strahan, Wilson, Cressman, & Buote, 2006). As with many other mental processes that are frequently activated, a degree of automaticity may develop (Mussweiler & Rüter, 2003). Indeed, the idea that social comparisons with media images are cognitively efficient has been suggested several times (Brown & Dittmar, 2005; Dalley, Buunk & Umit, 2009; Joshi, Herman & Polivy, 2004; Want, 2009). However, the empirical evidence for this claim is sparse. One study (Brown & Dittmar, 2005) had participants either pay high or low attention to thin-ideal images, as manipulated by presenting each image for either longer periods of time (i.e. 10-seconds each) in the high attention condition, or shorter periods of time (150-milliseconds) in the low attention condition. Results showed that more body-focused anxiety was experienced by participants who saw the images for longer, suggesting that the more cognitive resources available to devote to social comparisons, the greater their effect. However, this study also differentiated between participants who were high and low in the internalization of the thin-ideal. Individuals who internalize the thin-ideal are those who hold the belief that females “should” be thin, and who strive to be thin themselves. When this distinction was examined, the high internalizers were negatively affected by the images even in the low attention condition (Brown & Dittmar, 2005). Recall that one way to determine if a process is efficient is to see if it still operates under time pressure. If the process occurs when little time can be devoted to a stimulus, as in Brown and Dittmar’s low attention

condition, then this is often taken as evidence that it is an efficient process. Therefore, Brown and Dittmar's results suggest that social comparisons with media images may be cognitively efficient to some degree, at least for some participants.

However, results examining whether social comparisons with media images can take place under high cognitive load have provided a different picture. In studies from our lab, participants who were given the task of remembering a complex eight-digit number while viewing thin-ideal media images did not experience increases in negative mood, nor decreases in appearance satisfaction (Want, Botres, Vahedi, & Middleton, 2015), even among a subset of participants who strongly internalized the thin-ideal (Want & Saiphoo, 2017). Thus, research results have not been entirely consistent, with some evidence appearing to support the idea that social comparisons to thin-ideal images are cognitively efficient, while other research suggests they are demanding of cognitive resources.

Why is understanding the cognitive efficiency of comparisons to thin-ideal media images important? If this process requires substantial cognitive resources, then the thin-ideal images that we encounter on a daily basis are unlikely to affect our view of ourselves unless we happen to stop and think about them. On the other hand, if these comparisons are cognitively efficient, then every single thin-ideal image to which we are exposed, no matter what we happen to be doing, could potentially affect us. This is very important given the negative consequences of exposure to this type of image found in previous research. The goal of the present research is to provide further evidence regarding the cognitive (in)efficiency of social comparisons with media images, while also improving on the methods used in past research on this topic.

Issues with Previous Research

In addition to providing contradictory evidence regarding cognitive efficiency, previous studies on social comparisons with media images contain some problematic methodological issues. The first issue concerns the ecological validity of these studies. Some of the previous research has induced social comparison by directly prompting participants to compare themselves to the target images (e.g. Tiggeman & McGill, 2004). However, when we are exposed to these images in the real world, these prompts are not necessarily present. Thus, it is difficult to generalize some of these results. Additionally, the manipulation of cognitive load that was used in the Want et al. (2015) and Want & Saiphoo (2017) studies may not be generalizable to real life in that it might have been too cognitively taxing. It is unknown to what extent memorizing a complex eight-digit number (which is thought to be close to the upper limit on working memory) mimics the typical cognitive load experienced when we view media images in real-life situations.

An additional issue with the ecological validity of previous research is regarding the stimuli used. Previous studies have presented images of a single model against a white background. This is problematic because when thin-ideal media images are encountered in the real world, they are not presented alone. Instead, they are almost always presented with other images (e.g. brand logos), with text (e.g. advertising information, an article), or messages that often promote the thin-ideal (e.g. “Lose weight fast!”, “How to get bikini-body ready!” (Buote et al., 2011). These additional features can sometimes impact participants’ comparisons to the images themselves; sometimes positively (Veldhuis, Konijn, & Knobloch-Westerwick, 2017) and sometimes negatively (Knobloch-Westerwick & Crane, 2012). Thus, by presenting participants with thin-ideal models independent of these additional features of typical media

images, we are unable to get a sense of what occurs when participants are exposed to these images in a real-life setting.

Other issues with these studies include a high level of experimental demand. Appearance dissatisfaction has been called “normative discontent”, in that the dissatisfaction that women have with their appearance has become so prevalent its essentially a social norm (Tantleff-Dunn, Barnes, & Larose, 2011). Therefore, when women are exposed to idealized media images and asked questions about their appearance, they might simply respond in a way consistent with the expected normative discontent. Some studies have tried to use deception to reduce demand; they have tried to disguise the purpose of the study rather than presenting the study in the context of appearance or body image research. For example, in the previous lab studies (Want et al., 2015; Want & Saiphoo, 2017) participants were told the studies were investigating the effects of mood on short-term memory; the thin-ideal images were presented as supposed distractions from the task of memorizing a number. But such cover stories might reduce the ecological validity of the study. When we encounter idealized media in real life, it is often while doing something else that is still in a context where the images are somewhat relevant to our current tasks (e.g. shopping, browsing a magazine). Thus, while it is important to reduce demand by not directly asking participants to compare themselves to these images, it might be more ecologically valid to keep the investigations somewhat in the context of appearance and body image.

Another criticism of previous research concerns attention. It is possible that manipulation of cognitive load used in the Want et al. (2015) and Want and Saiphoo (2017) studies might have affected participants’ attention to the images. While participants were told to look at the images in that study, participants who were also memorizing the complex eight-digit number might have been simply looking in the direction of the images but not really paying attention to them (i.e.

not paying attention to the models' appearance in the same way as participants who were only asked to memorize a much simpler number). Thus, the absence of effects of exposure in the high cognitive load condition might have been because participants weren't even paying attention to the images, rather than because they were cognitively busy with the complex eight-digit number.

An additional criticism of research on this topic is the lack of consideration of the role of ethnicity. In previous studies (e.g. Want et al., 2015; Want & Saiphoo 2017) participants with diverse ethnic backgrounds were exposed to thin-ideal images of Caucasian women. This is potentially problematic; in his original theory, Festinger (1954) postulated that social comparisons are more likely to occur when the individual can relate to the target on some level. The Caucasian women in these images may not have been relevant comparison targets for non-Caucasian participants since their ethnicity was visibly different. Additionally, there is evidence suggesting that there are ethnic differences in female body image. Non-Caucasian women are less likely to be influenced by the mass media (Cashell, Cunningham, Landeros, Cokley, & Muhammad 2003; Warren, Gleaves, Cepeda-Benito, Fernandez, & Rodriguez-Ruiz, 2005), and are generally more satisfied with their bodies (Miller et al., 2000). These factors may make Caucasian women more likely to engage in appearance-related social comparisons with media images than non-Caucasian women. In terms of the efficiency of social comparisons, if Caucasian women's body image is more influenced by the media and they are more likely to engage in these comparisons, one might hypothesize that these comparisons are more likely to be automatic for this demographic group. For these reasons, it's important to take ethnicity into account.

The Present Study

The present study aimed to directly address these issues. A manipulation of cognitive load was used while participants were exposed to idealized media images. The study was presented to participants in the context of online shopping. We hoped that this cover story would strike a balance between avoiding demand characteristics while still testing the effects of media images in an ecologically-valid context. Two groups of participants were presented with thin-ideal images from online shopping websites and had to remember an aspect of the image – in this case, the colour of the clothes that were presented. This memory task acted as the manipulation of cognitive load. For some of the participants (low load condition), the sequence of colours was very simple (i.e. all the clothing items were the same colour). For other participants (high load condition), the sequence of colours was more difficult to remember (i.e. every clothing item was a different colour). This second set of participants completed a task that was more cognitively taxing, but that also forced them to pay attention to the images (addressing the attention problem with the high load condition from previous research) without explicitly asking them to focus on the appearance of the models. Additionally, they looked at the image for a goal other than social comparison, which might be similar to real life situations. A control group of participants viewed images that did not contain models. All participants completed measures of their mood and appearance satisfaction both before and after exposure to the images.

Only female participants were tested in this study. While males are also affected by media images, the effects of exposure to media images have been much more robustly established for females. Additionally, testing males also would have required completely different stimuli as the components for idealized images of males are quite different (i.e. muscular rather than thin). Finally, to address the issue of ethnicity, our thin-ideal images were

of Caucasian females and our sample only included those who self-identified as Caucasian. Participants were pre-screened using the Sociocultural Attitudes Towards Appearance Questionnaire-4 (SATAQ-4) media subscale. The SATAQ measures participants' opinions about general societal influences on body image, and the media subscale specifically measures their opinions about the impact of the media on body image. Only participants whose scores on this subscale indicated that they perceived at least some pressure from the media to change their appearance were eligible to participate. By doing this, we were able to investigate whether social comparisons with media images are cognitively efficient in individuals who report that they are most susceptible to media influence.

Hypotheses

There were two possible outcomes for this study: results could have indicated that social comparisons to thin-ideal images are cognitively efficient, or that they are NOT cognitively efficient. More specifically, our two competing hypotheses were:

H1 (social comparisons are cognitively efficient): In the high and low cognitive load conditions, but not the control condition, participants will experience an increase in negative mood and a decrease in appearance satisfaction, suggesting that social comparisons to thin-ideal images are cognitively efficient.

H2 (social comparisons are NOT cognitively efficient): In the low cognitive load condition only, negative mood will increase and appearance satisfaction will decrease, suggesting that social comparisons to thin-ideal images are not cognitively efficient.

Method

Participants

Participants were 124 Caucasian female undergraduate students between the ages of 17 and 54 recruited from Ryerson University. In exchange for their participation, participants received course credit in their introduction to psychology courses.

Cover Story

Participants were told that the study was investigating the effects of mood on memory performance in real-life situations. The real-life situation they were told we were investigating was online shopping. This cover story allowed us to reduce demand characteristics, while keeping the experiment in a context somewhat related to appearance and body image.

Materials and Measures

Online shopping questionnaires (pre-test). To enhance the cover story, participants were given a general questionnaire regarding their online-shopping behaviour and attitudes. Questions were based on those used in Jarvenpaa and Todd (1996). Questions were: a) “how often do you use online shopping websites?”, b) “how often do you make purchases on online shopping websites?”, c) “what are some online shopping websites that you typically use?”, d) “what are some reasons why you might make purchases via online shopping?”, e) “what are some reasons why you might NOT make purchases via online shopping?”, and f) “what specific types of products are you more likely to purchase using online shopping?” Because these questions were included only to bolster the cover story, data from these questions were not analysed.

Visual analogue scale items (pre- and post-test). To obtain measures of mood, participants were presented with computerized Visual Analogue Scales (VAS). Participants used

these scales to indicate how they were feeling at-the-moment by moving a slider on a line between 1 and 100, with the 1 and 100 points anchored with opposing mood terms. This 1-100 sliding scale method was first utilized by Heinberg and Thompson (1995) to reduce the likelihood that participants in pre- to post-test studies would just try to recall and replicate their scores from the pre-test on the post-test. There were three VAS items to measure mood: a happy-unhappy item, a calm-angry item, and a confident-insecure item. Participants' scores on these measures were averaged to analyze changes in mood pre- and post-image exposure. There were also three VAS items to measure energy/activity levels: a worried-relaxed item, an alert-drowsy item, and a sluggish-energetic item. These scores were not analyzed. In addition, there were four VAS items to measure appearance satisfaction: satisfaction with weight, shape, and overall appearance (with the 1 and 100 points marked as very dissatisfied and very satisfied, respectively), as well as an item rating how attractive participants were feeling in the moment (with endpoints marked very unattractive to very attractive). Participants' responses on these four measures were averaged to analyze changes in appearance satisfaction. All VAS items were based on those used in Want et al. (2015) and Want and Saiphoo (2017).

Thin-ideal and control images. Previous studies on this topic have utilized mainly advertisement images from magazines, while just one has used images from clothing-retailers' websites (Want et al., 2015). When components of the website such as sidebars and menus were removed, as in Want et al., the resulting images were similar to those found in magazines. For the present study, to be consistent with the cover story regarding online shopping, participants were presented with nine screen shots of clothing retailers' websites that included the additional features of the website. These screen shots were pages displaying and describing clothing items that included a photo of a model wearing the clothing item. Two images were close-up images of

a model's face, one was a model displaying a bikini, and the other six images were full body shots of models wearing form-fitting clothing items to make the thinness and shape of the model's body salient. Images were pilot tested by a sample of 15 female graduate students to ensure that they were rated highly on attractiveness and thinness compared to the average female. On average, the images were rated a 70 for attractiveness, and 76 for thinness on a 100-point scale. In the control condition, participants were exposed to images of non-clothing items from the same clothing retailer website (e.g. purses, hats, shoes) that were not displayed on a model. All images can be found in the Appendix.

Cognitive busyness manipulation. There were two different conditions for cognitive load; high and low. In all conditions, participants were told that they were going to see screenshots from online shopping websites, and that their task was to remember the colours of all the "target items", which would be indicated by a black arrow. For the high cognitive load condition, the sequence of colours the participant had to memorize was complex (e.g. black-blue-green, etc). In the low cognitive load condition, the sequence of colours that the participant had to remember was uniform and thus simple (e.g. black-black-black, etc.). The images in the two cognitive load conditions were the same in all aspects other than colour (see Appendix). In the control condition, the task was the same as the low cognitive load condition, except the images were of non-clothing items.

Manipulation checks. To ensure that our manipulation of cognitive busyness worked effectively, three manipulation check questions were asked. Participants were first asked to report the sequence they were tasked with remembering. This allowed us to know if they were had completed the task, and if thus if cognitive busyness was successfully manipulated. The second and third manipulation checks were specific to the high and low load conditions. In only

these two conditions, participants were asked how often they compared themselves to the models in the images they saw, and if they felt that they looked better or worse than the models when they made the comparison. These two questions were presented with VASs with endpoints of “not at all” or “worse”, to “all the time” or “better”.

Demographic questionnaire. Participants were asked to provide their age, height, and weight. All demographic questions were free response.

Sociocultural Attitudes Towards Appearance Questionnaire-4 (SATAQ-4). As mentioned, participants were pre-screened for participation using the media subscale of the SATAQ-4. Participants in the Ryerson University participant pool complete the pre-screen early in the semester and are then only able to sign up for studies for which their pre-screen answers qualify them. The four questions on the media subscale of the SATAQ-4 ask participants to rate the amount of pressure they feel from the media to look in better shape, look thinner, improve their appearance, and decrease their level of body fat, all on a scale of 1-5. A mean score of 3.75 on these four items was required for participants to be eligible for the study. This score is approximately the mean on this scale for North American samples (3.77; Schaefer et al., 2015), meaning that our sample were at or above the mean on the pressure they perceived from the media. We assumed that those who feel above-average pressure from the media are also likely to be those who compare themselves with media images most frequently. Hence, they are the participants most likely to have automatized the process of comparison with media images. Because the pre-screen at our university can only be used to include or exclude participants, we cannot access participants’ pre-screen data. Therefore, participants also completed the full SATAQ-4 at the end of their testing session to confirm self-reported levels of pressure they feel from the media.

Procedure

Participants were brought into the lab and instructed to read and sign the consent form. The consent form briefly outlined the study and presented the cover story. After participants had consented to participate, they were given brief instructions on what they would be doing in the study. Once the participant had begun the study, they first completed the online shopping questionnaire, and the pre-test VAS items. After the pre-test questionnaires, participants were presented with the cognitive busyness manipulation: nine thin-ideal or control images (depending on which condition they were randomized into) that appeared on the screen for eight seconds each. While previous studies have utilized more images (e.g. 12 images were used in Want et al., 2015), and have presented images for longer (e.g. 10 seconds each in Want et al., 2015), we chose to use fewer items because we believed that a longer sequence of colour words might have been too cognitively taxing for participants. Additionally, images were presented for a shorter period of time to quickly increase the cognitive load of participants in the high load condition (given that, for the first few items, participants would only have to remember a small number of colours). We predicted that eight seconds would likely give participants enough time to locate the starred item and take mental note of its description. Once the memory task was complete, participants completed the post-test VAS items, manipulation checks, SATAQ items, and the demographic questionnaire.

Results

Data Preparation

Participants younger than 17 or older than 27 were removed from analysis, based on the age range used in previous studies (Want et al., 2015; Want & Saiphoo, 2017). This criterion excluded six participants. Though participants were pre-screened for SATAQ-4 Media Subscale scores above 3.75, 13 participants scored below 3.75 on this subscale when assessed at the end of their experimental session and were excluded from data analysis as a result. Additionally, participants in the low load and control conditions completed a manipulation check to ensure that they were in fact under low cognitive load. To pass the check, participants must have reported the colour sequence correctly. Because participants were presented with nine black images in a row, they should have easily been able to report the sequence of colours correctly. Despite this, some participants still reported seeing different coloured images (e.g. a mix of mostly black and some brown, or mostly black and some grey), which indicates that they would have been rehearsing the sequence of colours that they believed that they saw. Because this would put them under some cognitive load during exposure to the images, just like participants in the high load condition, these participants (13 in total) were removed from analysis¹.

These exclusion criteria (which were not mutually exclusive) resulted in a total of 28 participants being removed from analysis which left us with a sample of 96 participants ($M = 19.20$ years old, $SD = 2.26$). There were no significant differences in average age, $F(2,93) = .142$, $p = .868$, $\eta_p^2 = .003$, height, $F(2,93) = 1.32$, $p = .273$, $\eta_p^2 = .028$, weight, $F(2,93) = 1.80$, $p = .172$,

¹ The inclusion of these 13 participants in the final data set did not significantly change results; values changed slightly but the overall findings were the same.

$\eta_p^2 = .037$, BMI, $F(2,93) = 1.59$, $p = .209$, $\eta_p^2 = .033$, or SATAQ-4 Media Subscale scores, $F(2,93) = .522$, $p = .595$, $\eta_p^2 = .011$, across participants in the 3 conditions. The average descriptive measures for each condition are presented in Table 1.

Data Analysis

Negative mood. A 3 (condition: high load, low load, control) x 2 (time: pre- and post-image exposure) mixed ANOVA with repeated measures on the second factor was conducted to investigate the change in negative mood from before to after thin-ideal image exposure. Results revealed no significant effects of time, $F(1,93) = 2.94$, $p = .090$, $\eta_p^2 = .031$, condition, $F(2,93) = .843$, $p = .434$, $\eta_p^2 = .018$, or the interaction, $F(2,93) = 1.51$, $p = .227$, $\eta_p^2 = .031$. However, tests of simple effects (see Table 2) revealed a significant increase in negative mood in the high load condition.

Appearance satisfaction. Additionally, a 3 (condition: high load, low load, control) x 2 (time: pre- and post-image exposure) mixed ANOVA with repeated measures on the second factor was conducted to investigate the change in appearance satisfaction from before to after exposure to the thin-ideal images. Results revealed a significant main effect of time, $F(1,93) = 15.99$, $p < .001$, $\eta_p^2 = .147$, but not condition, $F(2,93) = .897$, $p = .411$, $\eta_p^2 = .019$. However, the interaction between time and condition was significant, $F(2,93) = 13.16$, $p < .001$, $\eta_p^2 = .221$. Tests of simple effects (see Table 3) revealed a significant decrease in appearance satisfaction in the low-load condition, but no significant pre- to post-exposure changes in the other two conditions.

Level of social comparison. Participants in the high and load cognitive load conditions were asked how often they engaged in social comparison during thin-ideal image exposure. Because these questions were new to the current study, the analysis for these data was

exploratory. Two independent samples t-tests were run to test for differences in responses between the high and low load conditions². Participants in the high load condition ($M = 39.35$, $SD = 32.88$) reported comparing themselves to the models in the images significantly less than participants in the low load condition ($M = 63.55$, $SD = 28.09$), $t(63) = -3.20$, $p = .002$, $d = .791$. There were no significant differences in how participants felt they looked compared to the models in the images between the high load ($M = 29.71$, $SD = 19.79$) and low load conditions ($M = 23.13$, $SD = 24.84$), $t(63) = 1.17$, $p = .240$, $d = .293$.

Furthermore, participants' responses regarding how much they compared themselves to the images they were exposed to were related to the impact of the images. In the low load condition, there was a significant negative correlation between how much participants said that they compared themselves to the images and the change in appearance satisfaction that they reported, $r(31) = -.537$, $p = .002$, while no significant relationship was found between the extent of self-reported comparison and changes in appearance satisfaction in the high load condition, $r(34) = .009$, $p = .962$. These correlations were found to be significantly different from each other, $z = 2.34$, $p = .020$. No significant correlations were found between how much participants reported comparing themselves and negative mood change in the high and low load conditions, nor were the correlations between the direction of the comparison and appearance satisfaction or negative mood change significant in the high and low load conditions.

² Because participants in the control condition did not see images with models, they did not receive the follow up social comparison questions, and were thus excluded from this analysis.

Discussion

As predicted in Hypothesis 2, participants in the low cognitive load condition, but not the high cognitive load condition (or the control condition), experienced a decrease in appearance satisfaction from before to after exposure to the media images. However, the results for negative mood did not show a pattern consistent with either Hypothesis 1 or 2. Instead, there was some evidence suggestive of a significant increase in negative mood in the high load condition, but not the low load or control conditions. In short, while the appearance satisfaction results supported the hypothesis that social comparisons to thin-ideal images are not cognitively efficient (Hypothesis 2), the negative mood results do not seem to support this conclusion. These mixed results are unlike what has been found in previous investigations on this topic in our lab; however, so was the methodology of this study. This study used a different task, a different sample, and different stimuli compared to previous studies. It is therefore possible that the changes in the study design made between previous studies and the current one may have resulted in these differing results from the mood measure. Because multiple changes were made, we can only speculate regarding which specific change could be the cause of the differing results. These potential explanations will be discussed further below, but first the results from the appearance satisfaction measure are discussed.

Appearance Satisfaction

Our results for the appearance satisfaction measure were not only consistent with our Hypothesis 2, but also with previous studies (Want et al., 2015; Want & Saiphoo, 2017). Participants in the high load condition did not experience a change in their appearance satisfaction after being exposed to the thin-ideal images. This suggests that because these participants were cognitively busy, they did not have enough cognitive resources available to

engage in a social comparison with the models in the images. Participants' responses to the social comparison manipulation check questions further support this idea; participants in the low load condition reported that they compared themselves with the models in the images significantly more often than participants in the high load condition did. Additionally, the more that participants in the low load condition reported comparing themselves to the models in the images, the greater their decrease in appearance satisfaction. These results were not found for participants in the high load condition. In short, participants in the high load condition did not experience consequences of making social comparisons (i.e. decreased appearance satisfaction), nor did they explicitly report that they made comparisons. These results that are in line with previous studies further validate the previous results.

A criticism of previous work (Want et al., 2015; Want & Saiphoo, 2017) was that participants may have been so preoccupied with memorizing the eight-digit number that they may have not been paying attention to the images. Instead, it has been suggested that participants may have subtly looked away from the computer screen to prevent themselves from being distracted while memorizing the number. If this was the case, participants would not have been exposed to the images and thus have been less likely to have made comparisons to them. However, in this study, participants were required to pay attention to the images; they had to look at the images in order to determine what colour they would have to remember. The consistency between the results of this study and previous studies in the effect of the thin-ideal images on appearance satisfaction validates previous results; even when participants under high load are forced to pay attention to thin-ideal images, no detrimental effects on their appearance satisfaction are evident.

Negative Mood

Unlike the appearance satisfaction results, the negative mood results did not support Hypothesis 2, nor did they unambiguously support Hypothesis 1. While there was no main effect of time in the overall ANOVA, nor any interaction between time and condition, there was a significant difference between participants' pre-test and post-test negative mood scores in the high load condition, but not in the low load condition. Given the absence of a significant interaction term in the ANOVA, we must be cautious about the interpretation of these results. However, two things about this pattern of results are inconsistent with our hypotheses and with what has been found in previous studies: First, why didn't participants in the low load condition experience an increase in negative mood, as in previous studies? Second, why did participants in the high load condition experience an increase in negative mood? Potential answers to these questions will be discussed below.

Lack of change in the low load condition. It seems that, despite efforts to ensure otherwise, some participants in the low load and control conditions may have been under cognitive load. As mentioned previously, data from some participants in the low load and control conditions were removed because there was evidence that the manipulation did not work correctly in those cases. Evidence in these cases was that participants in these conditions recalled the colour sequence as something else other than what it was (i.e. black, nine times in a row). This was unusual because the sequence was purposely made to be simple so that participants could recall it easily. In most cases, participants who fell into this category would recall a mix of brown, black, and sometimes grey. It seems like in these cases participants would see the images as non-black, likely because of differences in colour perception, believe they were in the "different colours" condition, begin to memorize the colours, and as a result put themselves

under additional cognitive load. While we removed any participants whose recall pattern indicated that this may have happened, we cannot be sure that this did not occur for participants who still had a correct recall pattern. Despite explaining the task to participants in detail beforehand, they might have only realized they were in the “all black” (i.e. low load) condition after the presentation of the last image and up until that point they may have been keeping track of the number of black items they saw. Thus, participants in this condition may have actually been under some cognitive load, when we were intending for our manipulation to put them under a low cognitive load. If social comparisons are effortful, then participants in this condition might not have had enough resources available to engage in the comparison, which could explain why we did not find a change in negative mood in this condition. However, we did find a decrease in appearance satisfaction in the low load condition, which indicates that participants did in fact make comparisons between themselves and the models in the images they saw. Therefore, this is unlikely to be the explanation for the lack of an effect on negative mood in the low load condition.

Another potential explanation for the lack of negative mood change in this condition is that this result in previous studies has been attributed to the wrong cause. Previous studies have attributed this change in mood to participants comparing the bodies and appearances of the models in the images to their own. However, the problem with using mood as a dependent measure is that it is a general measure; when participants are answering post-exposure questions about their mood, they could be drawing on anything they’ve experienced in the study up to that point and not necessarily just how the images made them feel about their appearance. This contrasts with the specific focus of the appearance satisfaction measure; when we ask participants questions about their appearance, their responses will be based on how they feel

about their appearance and nothing else. While in this line of research we have assumed that when participants fill out the negative mood measure they will draw on how they feel about their appearance after being exposed to the media images, they could be responding to other things in the study. In other words, the validity of this measure is in question: this measure may not be measuring what we believe it to be measuring. Theory on mood and emotions supports this idea. Mood and emotions are two different constructs, and differ in many ways (Beedie, Terry, & Lane, 2005; Wilhelm & Schoebi, 2007). The most relevant distinction in this case is cause. Emotions tend to be caused by specific events, while moods are more general and collective (Beedie et al., 2005).

One alternative explanation for the increase in negative mood in the low load condition in previous studies is that it reflects participants' negative reaction to the ethnically homogeneous nature of the thin-ideal images that were presented. The present study involved an ethnically homogenous sample of Caucasian women, which is different from previous studies where the sample has been ethnically diverse. It is possible that non-Caucasian participants in previous studies may have felt underrepresented after viewing pictures of thin, attractive, Caucasian women for 2-minutes. They may have felt angry or annoyed at the lack of representation of the ethnic group with which they identified, and this was what was reflected in the increase in negative mood. This possibility is supported by post-experimental follow up responses from previous studies. Non-Caucasian women in those studies would sometimes report having thoughts related to the lack of non-Caucasian women in the images. For example, one participant from Want and Saiphoo (2017) said: "I wonder why there are no models of color". Thus, the mood effect in the low-load conditions of previous studies could have been due to non-Caucasian

participants feeling underrepresented in the images they viewed. In this study where we only tested Caucasian participants, this effect disappeared.

Related to the ethnicity of our sample, a study of Caucasian adolescent girls found that they will often criticize thin-ideal media images; they will report that the images are “fake” and “photoshopped”. However, when exposed to the images, they will also report that they feel worse about their appearance and bodies (Milkie, 1999). While this specific effect has only been tested in a sample of younger girls, this could explain why participants in the low load condition in this study did not experience a change in mood. They may have felt worse about their bodies and appearance specifically, but not worse overall because they recognized that these images are idealized. Further support for this explanation comes from Want and Saiphoo (2017). In this previous study, a sub-group analysis of Caucasian participants in the low load condition did experience an increase in negative mood, however, this change was not found to be significant. This result was attributed to the low power of the analysis, but in the context of the results of the current study and Milkie (1999), may be a result of another cause.

The images used as stimuli in this experiment could provide another potential explanation for the lack of change in negative mood in the low load condition. In previous studies, typical magazine images were used, while in this study we used screen shots from an online shopping website. One concern with previous studies (Want et al., 2015; Want & Saiphoo, 2017) was that participants may have not been paying attention to the images. But the task used in this study required participants to pay attention to the images to determine what colour they would have to remember. One possibility is that in previous studies participants’ increase in negative mood in the low load condition may have been a result of participants feeling bored with the task and the images; recall that in previous studies, participants in the low load condition only had to

memorize a simple number (11111111) and the images were supposedly unrelated to the purpose of the study. Conversely, because participants in this study were required to pay attention to the images and be engaged in the task, they may have been less bored. Thus, this could be why participants in this study did not experience an increase in negative mood as they did in previous studies. It's also possible that participants may have enjoyed looking at the images in the present study more; research shows that young women do generally enjoy online shopping (Lee, Fiore, & Kim, 2006; Yu & Damhorst, 2015). Because the images in the present study were in this context, as opposed to being presented with only plain white backgrounds, as in previous studies, this task may have been more enjoyable for participants, resulting in no particular increase in negative mood.

There is also an additional potential contextual explanation for the results of the present study. Inclusion for this study was based on participants having average or above average scores on the SATAQ-4 Media Subscale. This means that our sample felt as though they were particularly influenced by the traditional media when it comes to their body and appearance. However, we did not expose participants in this study to traditional media images. We did expose them to thin-ideal images, but these images were taken out of the context of the traditional media; they were presented to participants without the thin-idealization messages that typically accompany these images in magazines and on television. Instead, they were placed in the context of an online shopping website and were presented with the typical features of an online retailer (e.g. price, colour options, a description of the item, an “add to cart” button). Additionally, the models in the images were still thin and attractive, but they were not wearing extreme makeup or in an exotic setting, as they often are in magazines or in a television commercial. Instead, they were against a plain background, and were wearing clothes that the

participants themselves might wear; the images were taken from Forever 21's online website – a popular clothing retailer for young women. Want (2009) postulated that the context that the image is presented in is an important aspect of the social comparison. Because participants were not viewing these images in the typical traditional media context and without thin-idealization messages, it's possible that they still felt worse about their appearance, indicated by the decrease in appearance satisfaction, but this effect might have been more confined, indicated by the lack of change in negative mood generally. This explanation is supported by the results of a study by Kronen, Stice, Batres, and Orjada (2005). They investigated social comparisons to thin and attractive peers in a real-world setting by having participants interact with a confederate whose body dimensions either conformed to those of the thin-ideal or to those of the average North American woman. Interestingly, they also found a decrease in appearance satisfaction without a change in negative mood when participants interacted with a peer who embodied the thin-ideal. Similar to the present study, they hypothesized that the lack of change in mood may have been because the confederates were not in the extreme context of the traditional media; although their body dimensions fit the thin-ideal, they did not have flawless hair, perfect makeup, nor exotic outfits.

An additional explanation for the lack of change in negative mood in the low load condition concerns our SATAQ-Media Subscale inclusion criterion. Recall that to be included in this study, participants were required to have an above average SATAQ-Media Subscale score, indicating that they believe the media impacts how they feel about their appearance more than the average person. In previous studies that did not place this restriction on participants, the predicted change in negative mood in the low load condition was found (e.g. main analysis in Want and Saiphoo, 2017). Thus, this inclusion criteria may be the cause for the different results;

specifically, selecting only participants high in their susceptibility to media influence may have introduced a restriction of range in their negative mood scores, specifically a ceiling effect. Participants who scored highly on this measure may have also been in the upper range for negative mood, which may have limited how much more their negative mood scores could increase in response to the thin-ideal images. However, independent sample t-tests revealed no significant differences between pre- and post-test negative mood scores in this study and those from Want and Saiphoo (2017). The same result was found when investigating overall scores, and scores by condition. Additionally, no differences were found for appearance satisfaction scores between the studies. This is important to note since appearance satisfaction would be more closely related to SATAQ scores.

Increase in the high load condition. The second difference between this study and previous studies is the seeming increase in negative mood in the high load condition in this study. One major change made in this study from the previous work was the task participants were asked to engage in to manipulate cognitive load. Previous studies in this line of research have asked participants to memorize an eight-digit number while viewing a series of images. A criticism of this task was that it did not occur in an ecologically valid context; participants viewed the images for a purpose completely unrelated to appearance or body image. In the present study the task was instead presented in what was thought to be a more ecologically valid context: online shopping. Different levels of cognitive load were induced by asking participants to remember the colours of the models' clothes. However, this change may have induced a higher level of cognitive load than we intended for participants in the high load condition. Less than 50% of participants in the high load condition in the present study were able to correctly recall the nine-colour sequence, while in previous studies, the rate of successful recall for the

eight digits was closer to 100%. While many participants who fell into this category made just one minor error (e.g. recalled eight instead of nine colours), most made four or more errors. This included participants who remembered colours that were not presented or recalled the majority (and in one case, the entirety) of the sequence out of order. This suggests that participants may have found this task particularly difficult and thus, overly cognitively demanding. Because of this, participants in this condition may have become frustrated with the task, which may have increased their negative mood. There are different explanations for why participants may have found the nine-colour sequence particularly demanding. We had chosen a nine-colour sequence based on the presumed capacity of working memory; seven, plus or minus two items (Miller, 1956). However, whereas single digit terms, like those constituting the eight-digit number from previous studies, are one-syllable words (e.g. one, eight), colour words can be more than one syllable (e.g. yel-low). Increasing the number of syllables that need to be rehearsed likely increases cognitive load (Mano et al., 2013; Thomas et al., 2017). Additionally, evidence shows that the capacity of visual working memory which would be activated when remembering colours, is only about four-items (Alvarez & Cavanagh, 2004). Thus, it's likely that participants' working memory may have been overloaded because, as mentioned, memorizing the nine-colours they were presented with could have been over the typical capacity of verbal working memory.

Alternatively, it's important to acknowledge that an increase in negative mood in the high load condition could support the hypothesis that social comparisons to thin-ideal images are automatic (Hypothesis 1). An increase in negative mood is sometimes a consequence of this type of comparison, and if there is evidence of such an increase when participants are under high cognitive load, this could be taken to imply that the few cognitive resources they have available

are enough to produce social comparisons. Gilbert and colleagues' (1995) theory of how social comparisons occur is relevant to this possibility. They postulated that social comparisons are automatic and can thus occur when cognitive resources are limited, but that subsequent corrections to those comparisons are cognitively effortful. In the present study, it could be that participants in both the high and low load condition made comparisons to the images they saw, but because participants in the low load condition had more cognitive resources available they could recognize that the images were idealized, and thus irrelevant, and were able to reverse or reduce the effects of the comparison on their mood. This could be why we did not find an increase in negative mood in the low load condition. When individuals were under high load, they were unable to reverse the effects of the efficient comparisons, which is why we saw an increase in negative mood for participants in this condition. If this is the case, this would also be in line with a recent set of studies investigating the cognitive efficiency of social comparisons to thin-ideal images (Chatard, Bocage-Barthélémy, Selimbegović, & Guimond, in press). In this study, participants experienced an increase in appearance anxiety when subliminally presented with thin-ideal images, suggesting that these comparisons occur automatically and without much cognitive effort.

Conclusion and Future Directions

The purpose of this study was to further investigate the cognitive efficiency of social comparisons to thin-ideal images. Though we did not exactly replicate the results of previous studies in this line of research, some of these findings do support the idea that social comparisons require mental effort. In particular, only participants who were exposed to media images while under low load reported significantly decreased appearance satisfaction. In addition, the extent of the decrease in appearance satisfaction that participants reported in this condition was

significantly correlated with the extent to which they self-reported comparing themselves to the images. These results suggest that social comparisons are mentally effortful (cognitively inefficient).

However, participants' changes in negative mood in the present study were not consistent with the proposal that social comparisons are cognitively inefficient. There are several possible explanations for these different results. We may have failed to find a change in negative mood in the low load condition because participants may have been under some cognitive load, or, because the measure of negative mood may have been too general. When responding to the mood questions, participants may have drawn on any aspect of the study and not necessarily just how they felt about their appearance after being exposed to the thin-ideal images. Additionally, the presentation of thin-ideal images independent of a traditional media context may have weakened the harmful impact that these images can have on negative mood. Seeing these images may have made participants feel worse about their appearance, but seeing them in a context that they seemed to enjoy may have negated any change in negative mood. Overall, while in previous studies the negative mood and appearance satisfaction results have appeared to go hand-in-hand, these measures may actually be sensitive to different influences. Because of this, the changes made to the study design in this investigation may have changed the impact on the negative mood measure, but not the appearance satisfaction measure.

In terms of why we instead found an increase in negative mood in the high load condition, participants in this condition may have found this task too difficult, which may have frustrated participants as a result. Additionally, we should consider the possibility that the increase in negative mood participants in the high load condition experienced could indicate that social comparisons are automatic.

Additional research is needed to fully understand this finding. This could be achieved by adding a second control condition to this study design. Our current control condition exposes participants to non-clothing accessory items, presented without a model, that are all the same colour. This condition serves as a control condition for our low load condition; it allows us to distinguish if any changes in our dependent measures in the low load condition are due to participants viewing thin-ideal images or to the task of memorizing an easy nine-colour sequence. An additional control condition in which participants view non-clothing accessory items that are different colours (i.e. the same task as the high load condition but without thin-ideal models) is needed as a control condition for the high load condition. Such a condition would allow us to investigate whether the task of remembering a *difficult* nine-colour sequence in fact cognitively overloads participants and thus puts them in a worse mood. If the negative mood increase we observed in this study was due to cognitive overload, we should see evidence of it in this control condition also. If we do not observe that increase, this would support the notion that perhaps social comparisons are automatic.

Future studies should continue to attempt to match the ethnicity of the participants to the ethnicity of the thin-ideal images, and investigate the social comparison process in non-Caucasian women. To do this, different stimuli will likely need to be used. There is enough evidence to suggest that the (Caucasian) thin-ideal is not relevant to non-Caucasian women (Capodillupo 2015; Crago & Shisslak 2003; Gordon, Castro, Sitnikov, & Holm-Denoma 2010; Sussman, Truong, & Lim 2007; Milkie, 1999), so other types of idealized images should be used with ethnically diverse samples. Related to the images participants are to be exposed to, images outside of the traditional media context should continue be used. The question of cognitive efficiency is most relevant to real-life contexts; we want to know what happens when young

women are exposed to these images in their everyday life which is often not in a traditional media context. Additionally, a measure other than mood should be used. It appears that using mood as a dependent variable may not be valid in experiments like this. A more appropriate measure of affect may be the measurement of specific emotions, like appearance anxiety (Chatard et al., in press). Moreover, future investigations should use a task that is less cognitively demanding. Additional testing may be needed to determine what the ideal number and/or type of items for this task would be to make it cognitively demanding enough, but not to induce cognitive overload. Relatedly, not only should future manipulations strive to induce the ideal level of cognitive busyness in participants, this manipulation should be ecologically valid. Similar to the issue of context with the images, we want to make the design of the study as similar to real-life situations as possible to allow generalizability. Thus, future research should look into finding a cognitive busyness task that is typical of one's everyday experience. For instance, perhaps participants might be asked to plan their social calendar for the weekend, or to think about a grocery list, while being exposed to media images. Such manipulations of cognitive busyness may be more like the type of cognitive busyness participants experience when exposed to media images in their everyday lives. Last, but definitely not least, additional data needs to be collected. Unfortunately due to recruitment issues, we were not able to test our desired amount of participants; only 96 participants were included in this analysis, whereas we had hoped to test 150. These future directions for research will help shed additional light on the nature of women's social comparisons with thin-ideal media images.

Table 1

Participant Characteristics by Condition

| Variable | High Load Condition | | Low Load Condition | | Control Condition | |
|-----------------|---------------------|-------------------|--------------------|-------------------|-------------------|-------------------|
| | <i>M</i> (SD) | 95% CI | <i>M</i> (SD) | 95% CI | <i>M</i> (SD) | 95% CI |
| Age | 19.26 (2.57) | [18.49, 20.04] | 19.03 (2.33) | [18.22, 19.85] | 19.32 (1.83) | [18.51, 20.14] |
| Height (m) | 1.66 (.088) | [1.63, 1.69] | 1.64 (.073) | [1.61, 1.67] | 1.67 (.084) | [1.64, 1.70] |
| Weight (kg) | 63.30 (12.25) | [58.72, 67.88] | 61.50 (11.13) | [56.70, 66.30] | 67.78 (13.47) | [62.98, 72.57] |
| BMI | 22.82 (3.59) | [21.55, 24.09] | 22.90 (3.24) | [21.57, 24.23] | 24.31 (4.30) | [22.98, 25.64] |
| SATAQ- Media | 4.68 (.449) | [4.53, 4.84] | 4.69 (.465) | [4.52, 4.85] | 4.58 (.485) | [4.41, 4.75] |

Table 2

Simple Effects Analysis Results for the Differences in Pre- and Post- Image Exposure Negative Mood Scores for Each Condition.

| Condition | n | Pre-test <i>M (SE)</i> | Post-test <i>M (SE)</i> | <i>p</i> | 95% CI of the pre- to post- test difference | Cohen's d |
|-----------|----|---------------------------|----------------------------|----------|---|--------------|
| High load | 34 | 31.83 (2.90) | 36.57 (2.71) | .020 | [-8.71, -.764] | .272 |
| Low load | 31 | 38.07 (3.04) | 39.67 (2.83) | .446 | [-5.76, 2.56] | .090 |
| Control | 31 | 35.14 (3.04) | 34.93 (2.83) | .918 | [-3.94, 4.37] | .016 |

Table 3

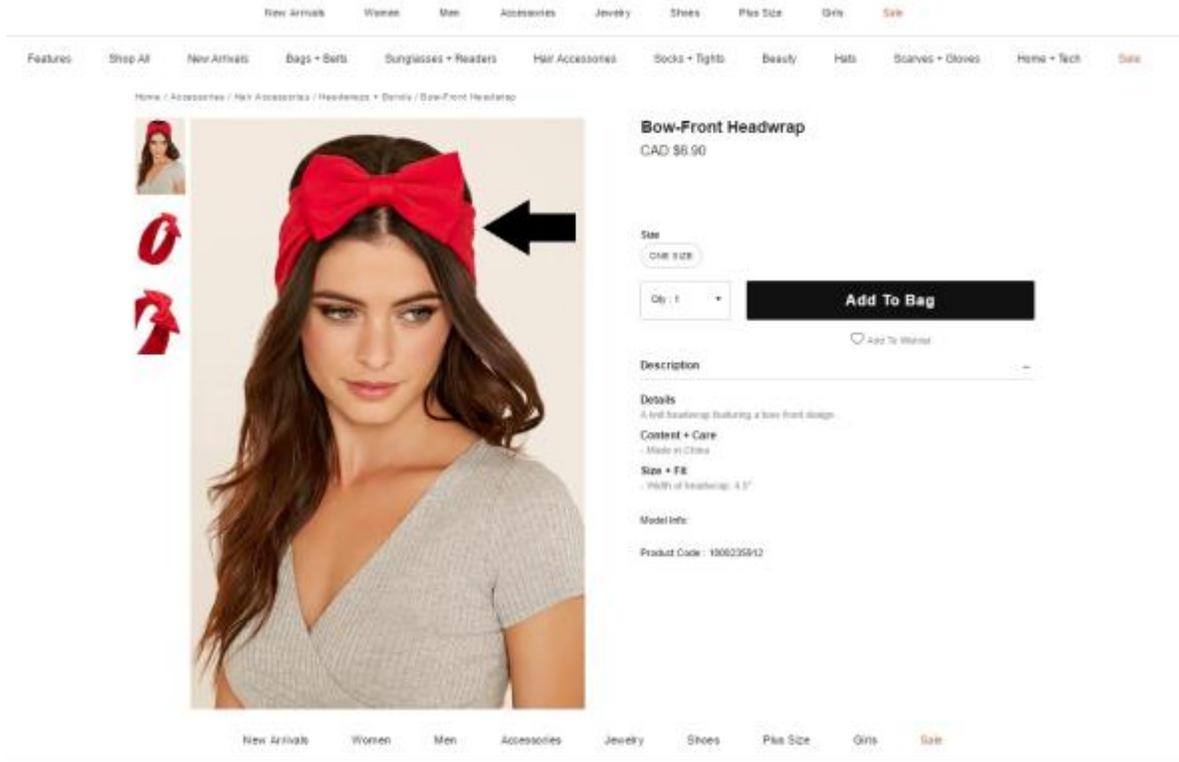
Simple Effects Analysis Results for the Differences in Pre- and Post- Image Exposure Appearance Satisfaction Scores for Each Condition.

| Condition | n | Pre-test <i>M (SE)</i> | Post-test <i>M (SE)</i> | <i>p</i> | 95% CI of the pre- to post- test difference | Cohen's d |
|-----------|----|---------------------------|----------------------------|----------|---|--------------|
| High load | 34 | 46.60 (3.35) | 46.14 (3.50) | .615 | [-1.34, 2.25] | .020 |
| Low load | 31 | 43.60 (3.50) | 37.52 (3.67) | <.001 | [4.20, 7.95] | .394 |
| Control | 31 | 40.83 (3.50) | 40.91 (3.67) | .932 | [-1.96, 1.80] | .004 |

Appendices

Appendix A: High Load Images

Home / Accessories / Hair Accessories / Headwraps / Details / Bow-Front Headwrap



The product page for the 'Bow-Front Headwrap' features a main image of a woman wearing a red bow headband. A black arrow points to the bow. To the left, there are three smaller thumbnail images of the headband. The right side of the page contains product details: the name 'Bow-Front Headwrap', the price 'CAD \$6.90', a 'Size' dropdown menu set to 'ONE SIZE', a quantity selector set to 'Qty: 1', and a prominent black 'Add To Bag' button. Below the button is a smaller 'Add To Wishlist' button. A 'Description' section is partially visible. The 'Details' section describes it as a 'A knit headwrap featuring a bow front design.' The 'Content + Care' section lists 'Made in China'. The 'Size + Fit' section lists 'Width of headwrap: 4 1/2\".

Bow-Front Headwrap
CAD \$6.90

Size
ONE SIZE

Qty: 1

Add To Bag

Add To Wishlist

Description

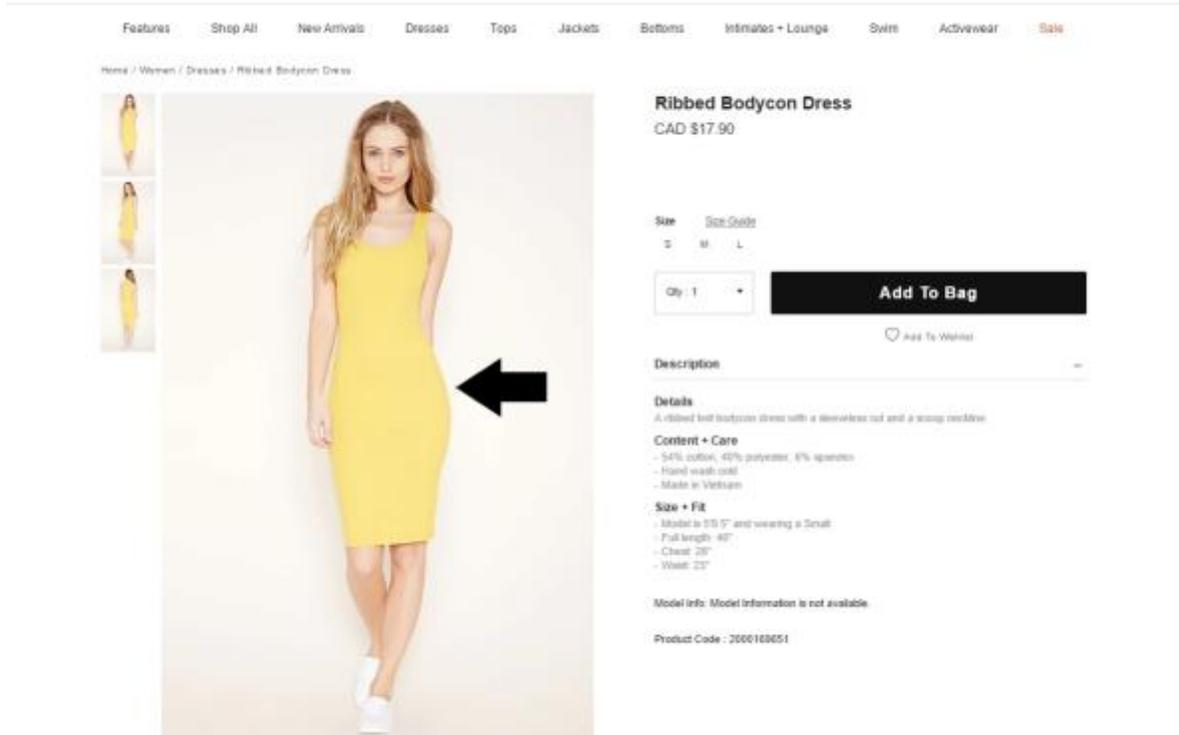
Details
A knit headwrap featuring a bow front design.

Content + Care
- Made in China

Size + Fit
- Width of headwrap: 4 1/2"

Model Info:
Product Code : 190025942

Home / Women / Dresses / Ribbed Bodycon Dress



The product page for the 'Ribbed Bodycon Dress' features a main image of a woman wearing a yellow ribbed dress. A black arrow points to the dress. To the left, there are three smaller thumbnail images of the dress. The right side of the page contains product details: the name 'Ribbed Bodycon Dress', the price 'CAD \$17.90', a 'Size' dropdown menu with options 'S', 'M', and 'L', a quantity selector set to 'Qty: 1', and a prominent black 'Add To Bag' button. Below the button is a smaller 'Add To Wishlist' button. A 'Description' section is partially visible. The 'Details' section describes it as 'A ribbed knit bodycon dress with a sleeveless cut and a wrap neckline.' The 'Content + Care' section lists '54% cotton, 42% polyester, 4% spandex', 'Hand wash cold', and 'Made in Vietnam'. The 'Size + Fit' section lists 'Model is 5'5 1/2\" and wearing a Size 4', 'Full length: 40\"', 'Chest: 36\"', and 'Waist: 23\".

Ribbed Bodycon Dress
CAD \$17.90

Size
S M L

Qty: 1

Add To Bag

Add To Wishlist

Description

Details
A ribbed knit bodycon dress with a sleeveless cut and a wrap neckline.

Content + Care
- 54% cotton, 42% polyester, 4% spandex
- Hand wash cold
- Made in Vietnam

Size + Fit
- Model is 5'5 1/2" and wearing a Size 4
- Full length: 40"
- Chest: 36"
- Waist: 23"

Model Info: Model information is not available.

Product Code : 2000169051

Home / Accessories / Features / Gathered Bandeau Bikini Top

Features Shop All New Arrivals Bags + Belts Sunglasses + Readers Hair Accessories Socks + Tights Beauty Hats Scarves + Gloves Home + Tech Sale

New Arrivals Women Men Accessories Jewelry Shoes Plus Size Gifts Sale

Gathered Bandeau Bikini Top

CAD \$12.99 CAD \$8.99

Size [Size Guide](#)

S M L

Qty: 1 **Add To Bag**

[Add To Wishlist](#)

Description

Details

- In a stretch knit, this bandeau bikini top features adjustable straps, gathered detailing on the front, removable cups, and a side-hook back closure. Matching bottoms available.

Content + Care

- Shell: 80% nylon, 20% spandex
- Lining: 68% polyester, 12% spandex
- Hand wash cold
- Made in China

Size + Fit

- Model is 5'10" and wearing a Small

Model Info:

Product Code : 2000181366

New Arrivals Women Men Accessories Jewelry Shoes Plus Size Gifts Sale

Features Shop All New Arrivals Dresses Tops Jackets Bottoms Intimates + Lounge Swim Activewear Sale

Home / Women / Bottoms / Vented Pencil Skirt

Vented Pencil Skirt

CAD \$11.90

Size [Size Guide](#)

M L

Qty: 1 **Add To Bag**

[Add To Wishlist](#)

Description

Details

A stretch-knit pencil skirt with an elasticized waist, a bodycon fit, and a vented front hem.

Content + Care

- 95% cotton, 5% spandex
- Machine wash cold
- Made in Cambodia

Size + Fit

- Model is 5'9.5" and wearing a Small
- Full length: 29"
- Waist: 25.5"
- Skirt length: 11.75"

Model Info: Model information is not available.

Product Code : 2000187464

Home / Accessories / Hair Accessories / Headwraps + Bands / Stretch Knit Twisted Headwrap



Stretch Knit Twisted Headwrap

CAD \$5.90

Size

One Size

Qty: 1

Add To Bag

Add To Wishlist

Description

Details

A headwrap crafted from a soft stretch knit with a twisted front.

Content + Care

- Made in China

Size + Fit

- Width of headwrap: 3" - 5"

- Diameter: approx. 6" - 7"

Model Info

Product Code: 100020114

Home / Mock Neck Bodysuit



Mock Neck Bodysuit

CAD \$14.90

Size [Size Guide](#)

S M L

Qty: 1

Add To Bag

Add To Wishlist

Description

Details

Style Deal - A sleeveless ribbed knit bodysuit featuring a mock neckline and a snap-button closure at the crotch.

Content + Care

- 90% rayon, 7% spandex

- Machine wash cold

- Made in Vietnam

Size + Fit

- Model is 5'10" and wearing a Small

- Full length: 28"

- Chest: 26"

- Waist: 25"

Model Info: Height: 5'10" | Bust: 34.5 | Waist: 24 | Hip: 34 | Wear Size: small

Product Code: 2000236275

Home / Women / Bottoms / Tulip Hem Skirt



Tulip Hem Skirt

CAD \$16.90

Size [Size Guide](#)
S M L

Qty: 1

Add To Bag

[Add To Wishlist](#)

Description

Details

A hot skirt featuring a layered tulip hemline and an elasticized waist.

Content + Care

- 88% rayon, 21% nylon, 4% spandex
- Dry clean
- Made in Cambodia

Size + Fit

- Model is 5'8" and wearing a Small
- Full length: 23"
- Waist: 25"

Model Info: Model information is not available.

Product Code : 200021487

Home / Women / Tops / Classic Cotton-Blend Cami



Classic Cotton-Blend Cami

CAD \$2.90

Size [Size Guide](#)
M L XL

Qty: 1

Add To Bag

[Add To Wishlist](#)

Description

Details

A classic cami crafted from a cotton-blend stretch knit.

Content + Care

- Lightweight
- 95% cotton, 5% spandex
- Machine wash cold
- Made in Nicaragua

Size + Fit

- Measured from Small
- 24" full length, 27.5" chest, 20" waist

Model Info: Model information is not available.

Product Code : 2000081705

Home / Women / Dresses / Mock Neck Midi Dress



Mock Neck Midi Dress

CAD \$22.90

Size [Size Guide](#)

S M L

Qty: 1

Add To Bag

[Add To Wishlist](#)

Description

Details
A sleeveless ribbed knit midi dress featuring a mock neckline and bodycon fit.

Content + Care

- 62% polyester, 21% rayon, 7% spandex
- Hand wash cold
- Made in Vietnam

Size + Fit

- Model is 5'9" and wearing a Small
- Full length: 38"
- Chest: 36"
- Waist: 22"

Model Info: Height: 5'9" | Bust: 32" | Waist: 24" | Hip: 34" | Wear Size: small

Product Code: 200202893

Appendix B: Low Load Images

New Arrivals Women Men Accessories Jewelry Shoes Plus Size Girls Sale

Features Shop All New Arrivals Bags + Belts Sunglasses + Readers Hair Accessories Socks + Tights Beauty Hats Scarves + Gloves Home + Tech Sale

Home / Accessories / Hair Accessories / Headwraps + Bands / Bow-Front Headwrap



Bow-Front Headwrap
CAD \$6.90

Size
ONE SIZE

Qty: 1 **Add To Bag**

[Add To Wishlist](#)

Description

Details
A knit headwrap featuring a bow-front design.

Content + Care
- Made in China

Size + Fit
- Width of headwrap: 4.3"

Model Info
Product Code: 1000259812

New Arrivals Women Men Accessories Jewelry Shoes Plus Size Girls Sale

Features Shop All New Arrivals Dresses Tops Jackets Bottoms Intimates + Lounge Swim Activewear Sale

Home / Women / Dresses / Ribbed Bodycon Dress



Ribbed Bodycon Dress
CAD \$17.90

Size **Size Guide**
XS M L

Qty: 1 **Add To Bag**

[Add To Wishlist](#)

Description

Details
A ribbed knit bodycon dress with a sleeveless cut and a scoop neckline.

Content + Care
- 54% cotton, 42% polyester, 4% spandex
- Hand wash cold
- Made in Vietnam

Size + Fit
- Bust is 35 1/2" and wearing a Small
- Full length: 40"
- Chest: 28"
- Waist: 23"

Model Info: Model information is not available.

Product Code: 2000168651

Home / Accessories / Features / Gathered Bandeau Bikini Top



Gathered Bandeau Bikini Top

CAD \$12.00 ~~CAD \$8.99~~

Size [Size Guide](#)

S M L

Qty: 1

Add To Bag

[Add To Wishlist](#)

Description

Final Sale

Details

- In a stretch knit, this bandeau bikini top features adjustable straps, gathered detailing on the front, removable cups, and a side-lock back closure. Matching bottoms available.

Content + Care

- Shell: 88% nylon, 20% spandex
- Lining: 98% polyester, 12% spandex
- Hand wash cold
- Made in China

Size + Fit

- Model is 5'10" and wearing a Small

Model Info:

Product Code: 2006181388

Reviews & Ratings

0 0 0 0 0 +

[Reviews \(0\)](#) [Write](#)

Home / Women / Bottoms / Vented Pencil Skirt



Vented Pencil Skirt

CAD \$11.90

Size [Size Guide](#)

S M L

Qty: 1

Add To Bag

[Add To Wishlist](#)

Description

Details

A stretch knit pencil skirt with an elasticized waist, a bodycon fit, and a vented front hem.

Content + Care

- 95% cotton, 5% spandex
- Machine wash cold
- Made in Cambodia

Size + Fit

- Model is 5'9.5" and wearing a Small
- Full length: 28"
- Waist: 25.5"
- Skirt length: 11.75"

Model Info: Model information is not available.

Product Code: 2000187484

Home / Accessories / Hair Accessories / Headwraps + Bands / Stretch Knit Twisted Headwrap



Stretch Knit Twisted Headwrap

CAD \$5.90

Size

One Size

Qty: 1

Add To Bag

Add To Wishlist

Description

Details

A headwrap crafted from a soft stretch knit with a twisted front.

Content + Care

- Made in China

Size + Fit

- Width of headwrap: 3" - 5"

- Diameter: approx 6" - 7"

Model Info:

Product Code : 1088203164

Home / Mock Neck Bodysuit



Mock Neck Bodysuit

CAD \$14.90

Size Size Guide

XS

Qty: 1

Add To Bag

Add To Wishlist

Description

Details

Style Details - A sleeveless ribbed knit bodysuit featuring a mock neckline and a snap-button closure at the crotch.

Content + Care

- 92% rayon, 7% spandex

- Machine wash cold

- Made in Vietnam

Size + Fit

- Model is 5'10" and wearing a Small

- Full length: 28"

- Chest: 26"

- Waist: 25"

Model Info: Height: 5'10" | Bust: 34.5 | Waist: 24 | Hip: 34 | Wear Size: small

Product Code : 2088238276

Home / Women / Bottoms / Tulip Hem Skirt



Tulip Hem Skirt

CAD \$16.90

Size [Size Guide](#)

S M L

Qty: 1

Add To Bag

[Add To Wishlist](#)

Description

Details

A hot skirt featuring a layered tulip hemline and an elasticized waist.

Content + Care

- 89% rayon, 21% nylon, 4% spandex
- Dry clean
- Made in Cambodia

Size + Fit

- Model is 5'7" and wearing a Small
- Full length: 38"
- Waist: 25"

Model Info: Model information is not available.

Product Code: 2000221487

Home / Women / Tops / Classic Cotton-Blend Cami



Classic Cotton-Blend Cami

CAD \$2.90

Size [Size Guide](#)

XS

Qty: 1

Add To Bag

[Add To Wishlist](#)

Description

Details

A classic cami crafted from a cotton-blend stretch knit.

Content + Care

- Lightweight
- 90% cotton, 1% spandex
- Machine wash cool
- Made in Nicaragua

Size + Fit

- Measured from Small
- 24" full length, 27.5" chest, 26" waist

Model Info: Model information is not available.

Product Code: 2000001705

Home / Women / Dresses / Mock Neck Midi Dress



Mock Neck Midi Dress

CAD \$22.90

Size [Size Guide](#)

XS

Qty: 1

Add To Bag

[Add To Wishlist](#)

Description

Details

A sleeveless ribbed knit midi dress featuring a mock neckline and bottom fit.

Content + Care

- 82% polyester, 11% rayon, 7% spandex
- Hand wash cold
- Made in Vietnam

Size + Fit

- Model is 5'9" and wearing a Small
- Full length: 26"
- Chest: 28"
- Waist: 25"

Model Info: Height: 5'9" | Bust: 32 | Waist: 24 | Hip: 34 | Wear Size: small

Product Code: 2000202003

Appendix C: Control Images



Braided Band Wool Fedora

CAD \$26.90

Size [Size Guide](#)

SM ML

Qty: 1

Add To Bag

[Add To Wishlist](#)

Description

Details

A wool fedora with a braided and studded faux leather band and a pinched crown.

Content + Care

- 100% wool
- Made in China

Size + Fit

- Measured from SM
- Circumference: 24"
- Brim: 3"

Model Info:

Product Code : 2000178304

Faux Leather Crossbody

CAD \$26.90

Size

ONE SIZE

Qty: 1

Add To Bag

[Add To Wishlist](#)

Description

Details

A structured faux leather crossbody with dual top handles, a zippered top closure, an adjustable shoulder strap, and three interior patch pockets.

Content + Care

- Shell: 100% polyurethane
- Lining: 100% polyester
- Made in China

Size + Fit

- Height: 6.5"
- Width: 9"
- Depth: 5.75"

Model Info:

Product Code : 1000160395





Faux Leather Oxfords

CAD \$26.90

Size [Size Guide](#)

5.5 6.5 7 7.5 8 8.5

Qty: 1

Add To Bag

[Add To Wishlist](#)

Description

Details

Style Deals - A classic pair of oxfords made from faux leather with a lace-up front and a round toe.

Content + Care

- Padded insole, textured outsole
- Upper, Insole, Lining: 100% polyurethane
- Lining 1: 100% Cotton
- Lining 2: 80% polyester, 9% cotton, 2% rayon
- Outsole: 100% TPR
- Made in China

Size + Fit

- Shaft height: 0.75"
- Platform: 0.25"

Model Info: Model information is not available.

Product Code : 2000201857



Faux Leather Tote

CAD \$39.90

Size

ONE SIZE

Qty: 1

Add To Bag

[Add To Wishlist](#)

Description

Details

A large unstructured tote crafted from faux leather with dual top handles, a magnetic snap-button closure, zippered sides to extend the width, and two interior patch pockets.

Content + Care

- Shell: 100% polyurethane
- Lining: 100% polyester
- Made in China

Size + Fit

- Height: 14"
- Width: 17.5"
- Depth: 6"

Model Info:

Product Code : 1000152439



Faux Patent Ballet Flats

CAD \$17.90

Size [Size Guide](#)

5.5 6 6.5 7 7.5 8 8.5 10

Qty: 1

Add To Bag

[Add To Wishlist](#)

Description

Details

Style Deals - A pair of faux patent ballet flats complete with a bow tie accent at the toe.

Content + Care

- Padded insole, textured outsole
- Upper & Insole: 100% polyurethane
- Outsole: 100% TPR

Size + Fit

- Heel height: 0.25"
- Shaft height: 2.5"
- Platform: 0.125"

Model Info: Model information is not available.

Product Code : 2000220229



Faux Leather Zip-Around Wallet

CAD \$12.90

Size

ONE SIZE

Qty: 1

Add To Bag

[Add To Wishlist](#)

Description

Details

A faux leather wallet featuring a high-polish zip-around closure, removable wristlet strap, and an interior compartment with three slip pockets.

Content + Care

- Shell: 100% polyurethane
- Lining: 100% polyester
- Made in China

Size + Fit

- Width: 6"
- Height: 3.5"
- Depth: 1"

Model Info:

Product Code : 1000203065



Floppy Wool Hat

CAD \$26.90

Size [Size Guide](#)

SM ML

Qty: 1

Add To Bag

[Add To Wishlist](#)

Description

Details

A floppy wool hat with a grosgrain ribbon band and a wide brim.

Content + Care

- 100% wool
- Made in China

Size + Fit

- Circumference: 24"
- Brim: 4.5"

Model Info:

Product Code : 2000221716



Fringe Faux Suede Booties

CAD \$52.90

Size [Size Guide](#)

5.5 6.5 7 7.5 9 10

Qty: 1

Add To Bag

[Add To Wishlist](#)

Description

Details

A pair of faux suede booties with fringe on the side, a faux wood block heel, and a side zip closure.

Content + Care

- Padded insole, textured outsole
- Upper: 100% polyester
- Lining & Insole: 100% polyurethane
- Outsole 1: 100% SBR
- Outsole 2: 100% rayon
- Made in China

Size + Fit

- Heel height: 3.5"
- Shaft: 4.25"
- Platform: 0.25"

Model Info: Model Information is not available.

Product Code : 2000182439



Quilted Faux Leather Backpack

CAD \$39.90

Size

ONE SIZE

Qty : 1

Add To Bag

Add To Wishlist

Description

Details

In quilted faux leather, this backpack features a drawstring closure, a magnetic snap-buttoned flap top, adjustable straps, an exterior zip pocket, and two interior patch pockets.

Content + Care

- Shell: 100% polyurethane
- Lining: 100% polyester
- Made in China

Size + Fit

- Height: 12"
- Width: 9.75"
- Depth: 5.25"

Model Info:

Product Code : 1000203102

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