

Understanding the influence of diverse media content on men's body image: The moderating effect of self-determination on male self-surveillance, self-evaluations, and cognitive performance

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Abstract

Grounded in self-determination theory (Deci & Ryan, 1985, 2000) and objectification theory (Fredrickson & Roberts, 1997), the purpose of this thesis was to investigate the role of dispositional autonomous and controlled motivation in predicting who might be more protected from or more vulnerable to experiencing state self-objectification (Manuscript 1), diminished cognitive functioning or cognitive performance (Manuscript 1 & 2), and poorer self-evaluations (Manuscript 2) following exposure to advertisements portraying one of two leading cultural body ideals: the male muscular ideal (Manuscript 1) or female thin ideal (Manuscript 2). The objectives were to investigate the effects of the two ideals while evaluating the contribution of autonomous and controlled motivation orientation in statistically predicting various body image consequences using five separate male undergraduate samples. Consistent with the overall hypotheses of the thesis, the muscular ideal video and thin ideal video significantly decreased men's cognitive functioning and cognitive performance compared to men in the neutral video conditions (Manuscript 1 & 2). In addition, men who were primed with the muscular ideal video demonstrated significantly higher levels of self-objectification compared to those in the neutral condition (Manuscript 1: Study 1 and Study 2). Mediation results revealed an indirect effect of the muscular ideal video on men's cognitive functioning (i.e., appearance schema activation) through self-objectification (Manuscript 1: Study 1), thereby supporting objectification theory as a means of explaining how portrayals of muscular body ideals affect men's cognitive function. However, inconsistent with previous studies, the female thin ideal did not significantly affect men's self-evaluations (Manuscript 2: Study 2). Lastly, in line with self-determination theory, all five studies (Manuscript 1 & 2) found that autonomous motivation orientation played a significant moderating role against the cognitive consequences associated with cultural body

ideals among young college men. Men who viewed the *muscular ideal* video and who reported high levels of dispositional autonomous motivation demonstrated less appearance schema activation, less difficulty solving a challenging Soma puzzle, and performed better on the Modified Stroop task compared to men with low levels of dispositional autonomous motivation (Manuscript 1). Similarly, men who reported high levels of dispositional autonomous motivation and viewed the *thin ideal* also demonstrated less appearance schema activation and less difficulty solving a challenging Soma puzzle compared to men who reported low levels of dispositional autonomous motivation (Manuscript 2). In contrast, controlled motivation orientation was not a significant moderator across all five studies (Manuscript 1 & 2). Collectively, our findings highlight the importance of incorporating autonomous motivation orientation and self-objectification into theoretical models of men's body image.

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Content of Thesis and Contribution of Authors

The present thesis is comprised of a general introduction, two articles, and a general discussion followed by appendices. The general introduction reviews the literature on men's body image and the consequences associated with cultural body ideals, explores objectification theory, and reviews self-determination theory outlining its dispositional motivation orientations and their relationship with facilitating positive body image, all of which set the stage for addressing the research questions at the heart of this dissertation. These introductory sections are followed by a brief introduction to the two articles including their main goals and objectives. The first article, entitled *The Protective Role of Autonomous Motivation against the Effects of the "Muscular Ideal" on Men's Self-Objectification, Appearance Schema Activation, and Cognitive Performance*, is currently under review (*Media Psychology*). The second article, entitled *The Effects of Female "Thin Ideal" Media on Men's Appearance Schema, Cognitive Performance, and Self Evaluations: A Self-Determination Theory Approach*, is published in *Body Image*. Next, the general discussion summarizes the findings documented in the two articles and acknowledges the limitations of the studies thereby offering fruitful avenues for future research. The final section of the dissertation is comprised of appendices which include the study materials that were used in the dissertation. The author of the dissertation appears as first author on each of the articles while the thesis supervisor and a former volunteer student from the supervisor's research laboratory appear as co-authors. The following are the contributions of the authors in each of the articles.

Article 1. The first author conceptualized the research project described in Article 1 including the study hypotheses and preparation and completion of the project submission form for approval from the Research and Ethics Board of the University of Ottawa. The first author

also created the videos that were used as experimental stimuli, prepared and programmed the cognitive tasks and created the online surveys that were administered to participants. The second author of the manuscript was the supervisor's volunteer student who helped collect data and participated in coding qualitative data. The first author of the article conducted the literature review, coded qualitative data, analyzed the data, and wrote the entire paper under the guidance of the supervisor.

Article 2. The first author conceptualized the research project described in Article 2 including the study hypotheses and preparation and completion of the project submission form for approval from the Research and Ethics Board of the University of Ottawa. The first author also designed the videos that were used as experimental stimuli and created the online surveys that were administered to participants. The first author of the article conducted the literature review, analyzed the data, and wrote the entire paper. Every step of the research process was conducted in consultation with and under the guidance of the thesis supervisor.

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INTRODUCTION

Until recently, empirical and theoretical research pertaining to the realm of body image was largely restricted to the female experience (Grogan, 2016; Murray & Touyz, 2012). In the past two decades, however, growing empirical efforts have illuminated the need to understand body image disturbances and preoccupations associated with the male experience (Cafri & Thompson, 2004; Grogan, 2008). Scholars, practitioners, and more recently public policy are increasingly interested in the nature, causes, and consequences of men's body image apprehensions (e.g., Cafri et al., 2005; McCabe & Ricciardelli, 2004; Paxton, 2012; Pope, Phillips, & Olivardia, 2000; Thompson & Cafri, 2007). This accession is largely due to the fact that men are progressively becoming more visible in popular culture (especially through exceedingly lean and muscular depictions; Strother, Lemberg, Stanford, & Turberville, 2012) and concurrently, severe body image-related disorders such as anorexia nervosa among men are on the rise (Dworkin & Wachs, 2009). In fact, recent studies suggest that one third of those suffering from anorexia nervosa and one fourth from bulimia nervosa are men and nearly equivalent numbers of men and women suffer from binge eating disorders (Hopewell Eating Disorder Support Centre, 2013; Hudson, Hiripi, Pope, & Kessler, 2007). Ultimately, the notion that body image is a predominantly female-oriented domain has lifted given that recent evidence suggests that males are approaching parity in terms of the pervasiveness of body dissatisfaction and body dysmorphia (McCreary & Sasse, 2000; Murnen & Karaszia, 2017; Olivardia, Pope, Borowiecki, & Cohane, 2004).

While cultural differences exist in body ideals (e.g., sub-Saharan African cultures desire larger body ideals for both men and women; Cash & Smolak, 2011), a lean, muscular, V-shaped figure with broad shoulders and a narrow waist (i.e., the "muscular ideal") is the current ideal for

men and a thin, slender, willowy body with little fat and a small waist-to-hip ratio (i.e., the “thin ideal”) is considered the contemporary ideal for women in Western cultures (Owen & Laurel-Seller, 2000; Ridgeway & Tylka, 2005). According to Owen and Laurel-Seller (2000), Western gender-specific body ideals are associated with wealth, virtue, control, and attractiveness. Yet, the adverse effects of media body ideals on psychological, emotional, behavioural, and cognitive well-being powerfully overshadow these perceived and sometimes observed advantages (see Morrison, Morrison, & McCann, 2006 for review of the correlates). Men’s body image disturbance is therefore recognized as a complex matter (Bergstrom & Neighbors, 2006), though means to understand and reduce the negative repercussions associated with such body ideals are under investigation (e.g., Lavender, Brown, & Murray, 2017; Strother et al., 2012).

The purpose of this thesis is therefore to contribute to this emerging body of research by exploring the effects of the male muscular ideal and female thin ideal on an area that has been previously overlooked. Specifically, we investigate the effects of such media body ideals on men’s cognitive functioning using a unique theoretical framework. In order to thoroughly convey and apprehend the research program, the following sections will provide a brief historical account of body image thus clarifying the development of the current definition, establish the importance of body image, review the literature particular to men’s body image concerns and health-related consequences, and provide a comprehensive review of the influence of the media on body image. Subsequently, Objectification Theory (Fredrickson & Roberts, 1997) will be introduced as a framework to explain *how* the media might affect men’s cognitive performance and Self-Determination Theory (Deci & Ryan, 1985, 2002) as a framework to explain and understand individual differences, namely, *who* may be more vulnerable to the muscular and/or thin ideal and *who* may be protected from the potentially adverse effects. The main research

questions are thus, does exposure to media advertisements portraying the male muscular ideal and/or female thin ideal affect men's cognitive functioning and, if so, how does particular media content exert its effect on men's cognition and for which types of people does such media content exert an effect on men's cognition? Two research programs (the first focuses on the effects of the male muscular ideal and the second focuses on the effects of the female thin ideal) were devised to answer these questions.

Brief Historical Account

Historically, body image research was first grounded in neuropathological ideology and medicine focusing on illness, abnormal behaviour, and individual deficiencies. For instance, Anosognosia, the lack of self-awareness in sensory, perceptual, motor, affective, or cognitive functioning due to brain damage from for example, hemiplegia (i.e., weakness or paralysis of the entire left or right side of the body), was a topic of great interest in the 1950s and 1960s (Fisher, 1986). Body image-related research was limited to the study of medical patients and intellectually disabled persons and the control groups consisted of "normal" persons (Schwab & Harmeling, 1968). Very little consideration for psychological or sociocultural variables prevailed at the time (Cash & Pruzinsky, 2002).

Evidence emerged to a great extent in the 1970s revealing that girls and women criticized their bodies more negatively compared to boys and men (e.g., Clifford, 1971). According to Fisher (1986), this more critical attitude toward the body likely reflected the transformation in cultural importance of evaluating women based on their physical appearance and their conformance to progressively thinner standards of beauty. Accordingly, body image research mounted and intervention strategies were established to help increase body satisfaction among clinical populations and women (e.g., Thorpe, 1976). The 1990s are considered the critical era in

the evolution of body image research since the domain further shifted from psychodynamic views to cognitive-behavioural and cognitive-processing perspectives. Likewise, this was the time when fashion trends transformed and exemplified the delicate, slender, heroin-chic look (i.e., the “objectified” body). The 1990s are well-recognized as the epoch when deep-rooted obsessions with thinness and muscularity truly began (Cash & Pruzinsky, 2002; Gordon, 1995; Labre, 2005; Leit, Pope, & Gray, 2001; Spitzer, Henderson, & Zivian, 1999).

Today, body image is a refinement of previous delineations and defined loosely as the multifaceted and “profound human experience of embodiment” (Cash & Pruzinsky, 2002, p.3). Specifically, body image is the complex mental image of one’s own body including the perceptions an individual has of their body such as attitudes and feelings about their shape and weight, beliefs about their own appearance (e.g., from past experiences and assumptions), and the sensations experienced such as how one feels in their body and not merely the feelings about their body (Canadian Women’s Health Network, 2012; Cash, 2004). Body image may be assessed in a variety of ways including measures of body satisfaction and dissatisfaction, body esteem, body-related shame, body image avoidance, appearance schemas, body distortions, and eating disorder inventories (for a review see Cash & Pruzinsky, 2002). Developments of scales explicitly for the evaluation of the male experience have surfaced especially in the last decade including, but not limited to, the Muscle Appearance Satisfaction Scale (Ryan & Morrison, 2010) and the Revised Male Body Attitudes Scale (Ryan, Morrison, Roddy, & McCutcheon, 2011). The fact that body image may be assessed in a variety of ways indeed highlights the complexity of the construct.

Moreover, there are healthy body images and unhealthy body images, each a unique paradigm (Williams, Cash, & Santos, 2004). A negative or unhealthy body image is

characterized by a distorted perception of the body and adverse feelings toward the entire body or body parts such as shame, appearance anxiety, body dissatisfaction, or self-consciousness (Tylka & Wood-Barcalow, 2015). On the other hand, a positive or healthy body image is characterized by an accurate perception of the body's natural shape and size, and feelings of satisfaction and confidence with one's appearance without concerns or over-investment in weight and physical appearance (Tylka & Wood-Barcalow, 2015).

Although the literature is dominated by a focus on unhealthy body image that aims to understand various pathologies, current efforts are exploring how to promote positive body image in order to attain a comprehensive understanding of the construct (e.g., Halliwell, 2015). For example, Smolak and Cash (2011) illustrated that solely focusing on relieving symptoms of negative body image without taking into consideration how to foster positive body image essentially limits knowledge and inadvertently diminishes the efficacy of treatment programs. Cash and Pruzinsky (2002) called for new research to investigate the development and experience of positive body image by probing its resilience and protective factors as well as by exploring individual defense factors against negative body image. In general, experts in the field (e.g., Levine & Murnen, 2009; Tiggemann, 2014) emphasize that failing to explain why some individuals are more resistant than others to the deleterious effects associated with cultural body ideals continues to be a gap in the literature. The current dissertation therefore examines the potential moderating roles of dispositional motivation orientations in order to address this gap and is described more clearly in the coming sections.

The Importance of Body Image

Commencing in early infancy, body image affects our views, emotions, cognitions, perceptions, and even relationships (Tanaka, 2006; Tremblay, Lovsin, Zecevic, & Larivière,

2011). Body image is also constantly changing through life experiences including natural evolution and ageing, trauma, treatment, and social interactions (Aghaei, 2006). While body image develops and changes with time, it remains intricately tied to self-esteem (Aghaei, 2006; McFarlane, McCabe, Jarry, Olmsted, & Polivy, 2001) and overall quality of life (Cash & Pruzinsky, 2002). According to a Canadian study by Olmsted and McFarlane (2004), body image is of physical and psychological importance to individuals because it is strongly associated with health status, weight, and self-esteem.

In addition, a healthy body image is associated with a number of positive outcomes including greater use of sun protection (e.g., SPF products; Andrew, Tiggemann, & Clark, 2014), overall increased self-care such as healthier eating, exercise behaviours (Tylka & Wood-Barcalow, 2015), and self-examination screening for cancer (Ridolfi & Crowther, 2013), as well as increased well-being (e.g., self-esteem, optimism, confidence, and proactive coping; Avalos, Tylka, & Wood-Barcalow, 2005), increased body appreciation and self-love (Wood-Barcalow et al., 2010), more comfort living day-to-day in one's body (e.g., recognizing personal worth; McHugh et al., 2014), more inner positivity (such as smiling, helping others, asserting oneself; Tylka, 2011), greater ability to filter and reject harmful media messages (Wood-Barcalow et al., 2010), and positive psychological growth (Fredrickson, 2001). A healthy body image is also found to safeguard against destructive behaviours ranging from poor eating habits (del Mar Bibiloni, Pich, Pons, & Tur, 2013), to alcohol intake (Kelly et al., 2016), and even risk-taking behaviours such as financial risk-taking (e.g., risky investment decisions; Chan, 2015), sexual risk-taking (e.g., not using a condom) and injection drug use (Lowry, Robin, Kann, & Galuska, 2014).

On the other hand, negative body image is associated with various adverse effects such as low self-esteem, depression, and eating disorders, to name a few (Olivardia, Pope Jr., Borowiecki, & Cohane, 2004). Neumark-Sztainer, Paxton, Hannan, Haines, and Story (2006) uniquely explored the potential benefits of a negative body image to expand the literature in the domain. Their five-year longitudinal study of male and female adolescents investigated the associations between body satisfaction at Time 1 and health behaviours at Time 2. They explored whether some degree of body dissatisfaction would benefit individuals by enhancing their motivation to engage in healthier eating and physical activity. Interestingly, findings revealed that low levels of body satisfaction did not serve as a motivator for engaging in healthier behaviours but actually predicted poorer weight management, which in turn increased the risk of weight gain and poorer overall well-being. Specifically, they found that less body satisfaction predicted increased levels of dieting and binge eating, and decreased levels of physical activity among boys and girls. Overall, their efforts further support the notion that body satisfaction and body image in general play a role in shaping health behaviours (Neumark-Sztainer et al., 2006).

The Prevalence of Men's Unhealthy Body Image

The ever-increasing number of men who experience body image-related issues is a public health concern (Paxton, 2012). According to an analysis of three North American large-sample surveys (conducted in 1972, 1985, and 1996), negative body image among men has become increasingly widespread (Cash, 1998). Over the 24-year period, overall appearance dissatisfaction grew from roughly 15% to 43%. A more recent Canadian analysis based on two large-scale surveys (collected in 2002 and 2012) reported that the prevalence of eating disorders significantly increased among men and significantly decreased among women (Statistics Canada, 2014). Men between 15 and 64 years of age who reported seeking professional help for an eating

disorder increased from approximately 20 thousand to more than 27 thousand over the ten-year period while women who reported seeking professional help for an eating disorder decreased from roughly 102 thousand to approximately 85 thousand (Statistics Canada, 2014). Consistent with previous findings (Hudson et al., 2007; Woodside, 2013), the prevalence of eating disorders is regarded as approximately one third men and two thirds women.

Research findings across Western nations also demonstrate increasingly higher rates of body image disturbances in men including Australia (Gregor, 2004; National Eating Disorder Collaboration, 2016), the United States (Fiske, Fallon, Blissmer, & Redding, 2014) and the United Kingdom (Baghdjian, 2011; Micali, Hagberg, Petersen, & Treasure, 2013). Woodside (2013) asserts that men in many Western cultures are facing an epidemic of eating disorders since research reveals widespread proportions across different communities. According to Anderson (2013), eating disorders and body image concerns have traditionally been perceived as a female-related problem and thus, boys and men may be more reluctant to seek help. The current pervasiveness of eating disorders and body image disturbances among men in Western societies is therefore quite possibly an understatement (Anderson, 2013; Woodside, 2013). In fact, Murray and Touyz (2012) maintain that American men are approaching parity with women in terms of the prevalence of body dissatisfaction. Fundamentally, the problems associated with negative body image have reached new records among men and thus, current research undertakings, public health practitioners, and policy leaders are advocating for the development of new research initiatives specific to the male experience and intervention programs to help alleviate the issues (Paxton, 2012).

A Review of the Consequences Associated with Men's Unhealthy Body Image

In general, while the prevalence for body dissatisfaction rises among men in Western cultures, consequently so does the frequency of various adverse emotional, psychological, and behavioural health outcomes (Kearney-Cooke, 2002). For example, findings reveal that body dissatisfaction among men is associated with lower self-confidence, depressive symptomatology (Olivardia et al., 2004), greater appearance anxiety (Davis, Brewer, & Weinstein, 1993), social anxiety (Murray & Touyz, 2012), increased loneliness (Chaney, 2008), over-investment in self-appearance (e.g., clothing/apparel; Frith & Gleeson, 2004), increased drive for muscularity (Pope et al., 2000), increased muscle dysmorphia (Murray & Touyz, 2012) and greater distorted body perceptions (Kaminski, Chapman, Haynes, & Own, 2005).

In terms of the behavioural outcomes, negative body image is associated with increased disordered eating (Cramblitt & Pritchard, 2013), greater dietary supplement use (O'Dea & Rawstorne, 2001), increased use of dieting regimes (Agliata & Tantleff-Dunn, 2004; Ricciardelli & McCabe, 2004), compulsive exercise (Ingledew & Sullivan, 2002; Kelly, Cotter, Tanofsky-Kraff, & Mazzeo, 2015), and the use of performance-enhancing drugs (Grogan, 2008; Schwartz et al., 2010).

Moreover, research demonstrates that while young adults frequently feel dissatisfied with their body weight and size, in many situations body image disturbances are reported by those with a healthy weight (Abbott, Lee, Stubbs, & Davies, 2010; Duncan, Duncan, & Schofield, 2011). In adolescent and college samples, between 28% and 68% of normal-weight men perceived themselves as underweight and reported the desire to increase their muscle mass through dieting and strength training (McCabe & Ricciardelli, 2004; McCreary & Sadava, 2001). Olivardia et al. (2004) found that college men selected the ideal body to be 25 pounds more muscular than their own level of muscle. They further examined whether lower levels of

perceived muscularity and perceived fatness were associated with depressed mood and body dissatisfaction. Results showed that only perceptions of low muscularity were related to such negative attitudes and mood. Perceptions of fatness or heaviness did not predict such negative effects thereby indicating that muscularity may be more important to some men. Similar findings were found by Tiggemann, Martins, and Kirkbride (2007) who asked participants to rate their preference for several body figures varying on adiposity and muscularity indicators. They too found that more muscular body types were the desired feature among both sexual minority and heterosexual men (Tiggemann et al., 2007).

Several researchers infer that many men who strive for greater muscularity tend to hold stricter gender-role principles and conform to societal male norms (e.g., McCreary, Saucier, & Courtenay, 2005). In fact, Olivardia et al. (2004) found that minimal muscularity among men was significantly related to body dissatisfaction and less perceived masculinity. Moreover, Hennen (2005) noted that there are indeed gay men who value muscularity norms. Sánchez, Greenberg, Liu, and Vilain (2009) found that even in same-sex romantic relationships, many men perceived pressures to be physically attractive and pressures to appear muscular and masculine in order to be accepted by society and perceived as desirable by other gay men. Hence, perceived pressures to be muscular can be experienced by men regardless of weight status or sexual orientation.

Furthermore, in some cases obesity and binge eating are consequences of negative body image (Grilo, Masheb, Brody, Burke-Martindale, & Rothschild, 2005). Rosen (2002) reported that the most common aspects of physical appearance that contribute to body dissatisfaction for both obese and non-obese men are the waist or abdomen followed closely by chest, arms, and the body as a whole. There is also strong evidence suggesting that obesity is related to poor body

image, but that not all obese persons suffer from this problem or are equally vulnerable (Rosen, 2002). Although properly monitored and regulated weight-control practices may be appropriate for obese individuals, extreme weight control and weight loss practices can cause physical and mental degradation (Lock et al., 2001). For example, severe dieting can cause fatigue, sinus problems, bloodshot eyes, gallbladder disease, seizures, dehydration, malnutrition, and atrophy of muscles (i.e., when muscles fade). Psychological consequences may include irritability, depression, lower sex drive, and the risk of falling vulnerable to eating disorders like bulimia nervosa, anorexia nervosa, or binge eating which typically contributes to the issue of obesity rather than help the person shed weight and improve their body image (Friedman, Reichmann, Costanzo, & Musante, 2002).

In response to body dissatisfaction and general body image disturbances, some men seek ways to modify their body, which often leads to extreme and harmful actions. Some men use anabolic-androgenic steroids, prohormones, and/or ephedrine to improve their appearance through muscle augmentation (Cafri et al., 2005; Olivardia et al., 2004; VandenBerg, Neumark-Sztainer, Cafri, & Wall, 2007). A Canadian study based on data collected in 2001 and 2002 from the Health Behaviour in School-Aged Children National Research Project found that four percent of boys in the ninth and tenth grade reported anabolic steroid use (Boyce, 2004). The practice of using anabolic steroids forecasts many psychological and physiological risks such as fluctuations in mood and changes in the level of low-density lipoproteins (LDL) and high-density lipoproteins (HDL) in the blood stream (Cafri et al., 2005). Explicitly, anabolic-androgenic steroids cause an increase in LDL (lipoproteins that deposit cholesterol in the arteries), and a decrease in HDL (lipoproteins that cleanse the arteries) thereby increasing the risk of heart

disease (Cafri et al., 2005). In general, anabolic steroid use can have serious deleterious effects on psychological and somatic well-being.

Additionally, men are also increasingly likely to use cosmetic surgery to modify their appearance (Davis, 2002). Although Canadian statistics are not yet available through the Canadian Society of Plastic Surgeons, the United States and the United Kingdom generate national cosmetic surgery statistics. According to the American Society of Plastic Surgeons (2015), the most popular procedures for men are rhinoplasty (nose reshaping), blepharoplasty (eyelid surgery), breast reduction, liposuction, and facelift. Though these same procedures were the top five surgical procedures in 2005, the rate of occurrence has increased (Grogan, 2008). Likewise, according to the British Association of Aesthetic and Plastic Surgeons (2015), the most common procedures in order of popularity are blepharoplasty, rhinoplasty, breast reduction, liposuction, ear correction, and facelift. Botox anti-wrinkle injections are also increasing in popularity (Flynn, 2007). Between 2002 and 2006, the number of total surgical cosmetic procedures for men in the United States grew by 5% while less invasive methods (such as collagen fillers) increased by 41% (Grogan, 2008). Evidently, men are using various surgical methods and injection treatments to modify their appearance.

Although attention dedicated to the psychological, physical, and behavioural consequences of men's body image disturbances has proliferated, a great deal is still unknown. In particular, the effects on cognitive processes and cognitive performance are scarce. To date, only a handful of articles investigate the relationship between men's body image disturbance and cognitive health. For example, studies by Yanover and Thompson (2008a, 2008b) explored the relationship between body dissatisfaction and academic performance among undergraduate men and women. Their findings revealed that academic interference such as lower levels of

concentration in school were associated with body dissatisfaction and worrying about eating and appearance. Gervais, Vescio, and Allen (2011) explored the effects of an induced state of self-awareness on math performance among college men and women. Students were assigned to either the body objectification condition (i.e., induced state of self-awareness) or the neutral condition. Both groups were subject to a short interview by a confederate. Those assigned to the objectified condition received special treatment from the confederate. Periodically, the confederate would gaze at the participant's chest and touch their arm or leg. In the neutral condition, the confederate was professional and did not gaze at or touch the participant. Following the interview, the participants were subject to a math test adapted from typical qualitative and logic questions from the Graduate Records Examination (GRE). Results showed that women in the objectifying gaze condition performed significantly worse than women in the control condition. However, men in the objectifying gaze condition performed similar to men in the control condition. Further, in the objectifying gaze condition, women performed significantly worse than men, whereas in the control condition women performed similarly to men. Limitations suggested that men typically score higher on math related tasks compared to women and that future studies should explore similar body image-related manipulations using different cognitive tests.

Griffiths, Murray, and Touyz (2013) investigated whether set shifting performance and a weak central coherence were associated with drive for muscularity and muscularity-oriented disordered eating in college men. Set shifting (i.e., the ability to switch between mental tasks) was measured using the Wisconsin Card Sorting Test (WCST) which relies on cognitive functions including attention, working memory, and visual processing. The participants were required to match a stimulus card to one of four category cards based on colour, shape, or

number depending on the categorization rule applied by the researcher. After a number of correct responses, the categorization rule changed and the participant had to perform according to the new rule, hence the shift in focus. Central coherence (i.e., the ability to “see the big picture” without fixating on details) was measured using the Matching Familiar Figures Test, a measure of detail-processing ability. Participants were asked to look at a target picture and match the target to one of eight very similar alternative pictures where only one is identical to the target. Performance is based on speed (time it takes to respond) and accuracy (the number of errors) and scores are combined to create a measure of efficiency. Performance profits from a local, detail-oriented style of processing and therefore, people with weak central coherence tend to respond more quickly and error-free indicating greater efficiency on the task. The findings revealed that set shifting difficulties and a weak central coherence were both positively associated with the drive for muscularity, and set shifting difficulties were positively associated with muscularity-oriented disordered eating (Griffiths et al., 2013). Therefore, cognitive performance based on attention, working memory, and global integration was poorer in men who reported a higher drive for muscularity and muscularity-oriented disordered eating.

In general, evidence suggests that conditions that heighten body image awareness and/or disturbance may interfere with optimal cognitive functioning. However, most of the research in this area is restricted to female student samples. For example, studies exploring American (Florin, Sjulst, & Stettler, 2011), Chinese (Xie et al., 2006), and Finnish (Mikkila et al., 2003) adolescent girls found that those who perceived themselves as overweight, irrespective of their actual weight status, had significantly lower academic grades compared to adolescents who did not perceive themselves as heavy. In addition, a few studies focusing on student math performance revealed that undergraduate women who were exposed to body self-conscious

manipulations performed worse on a math test compared to women who were not exposed to this kind of manipulation (Fredrickson, Roberts, Noll, Quinn, & Twenge, 1998; Gay & Castano, 2010; Grabe & Hyde, 2009). Essentially, when adolescent girls in high school or young women in university are primed to focus on their appearance, their performance on academic tests is undermined, indicating that body image awareness or disturbance can prevent women from achieving their full potential academically.

To date, a variety of perspectives have investigated the relationship between body image and cognitive functioning. For instance, some studies indicate that body image preoccupations or contexts that enhance body image apprehensions may increase cognitive load by directing attention inward onto the self (increasing self-consciousness and self-monitoring) thereby limiting cognitive resources and impairing cognitive performance on alternative tasks (Gay & Castano, 2010). Other studies found that body dissatisfaction led to poorer self-esteem (Murphy, 2011) and poorer self-assessments (Nesbi & Newton, 2012) which in turn, thwarted student efforts to succeed in school. Lastly, some research has demonstrated the deleterious effect of malnutrition in clinical samples (e.g., anorexia patients; Ben-Tovim & Walker, 1991), non-clinical samples (Labarge, Cash, & Brown, 1998), and dieters (Green & Rogers, 1995) on cognitive functioning. For example, Green, Rogers, Elliman, and Gatenby (1994) found that compared to non-dieters, dieters and restrained eaters displayed impaired performance on a visual-spatial processing vigilance task, short-term memory task, and motor control test. They proposed that the effect of food restriction on energy metabolism or other physiological mechanisms might explain the decrease in cognitive performance. Overall, Halliwell, Diedrichs, and Orbach (2014) assert that similar cognitive consequences are quite likely affecting adolescent boys and young adult men and should be further investigated.

Given the consequences of men's unhealthy body image discussed thus far, evidence provides considerable consensus in terms of the emotional, psychological and behavioural effects, but the cognitive effects are limited in scope and unearth inconsistent findings among men. The current research program therefore focuses strictly on the influence of cultural body ideals on men's cognitive functioning using a relevant theoretical framework. The subsequent sections are intended to address the various factors influencing body image prior to justifying our attention toward the mass media, as well as provide a brief review of the theories surrounding the influence of the media and our grounds for applying objectification theory to the current research program.

Factors Influencing Body Image Disturbances

A number of factors may influence an individual's body image including socioeconomic, biological, and sociocultural factors. The relationship between socioeconomic status (measured by highest level of education or annual income) and body image outcomes yield varying results (Celio, Zabinski, & Wilfley, 2002). Based on a community sample, Swami, Hadji-Michael, and Furnham (2008) found that higher educational qualifications were related to more body appreciation compared to those with lower educational backgrounds. In contrast, O'Dea and Caputi (2001) asked adolescents about their family income and found that middle and high-income adolescents were more likely to have low self-esteem and high body dissatisfaction compared to low income adolescents. Similarly, Paeratakul et al. (2002) found that perceptions of overweight were higher and more inaccurate among middle and high-income adults. They also found that perceptions of overweight were higher among adults with higher education. Results increasingly vary when gender and cross-cultural comparisons are included (Grogan, 2008).

According to Cash's (2002) model of body image development and experiences (p. 39), biological and sociocultural influences are the most consistent predictors of negative body image. Cash (2002) highlighted four main influential factors including physical characteristics and personality attributes (biological predispositions), and interpersonal experiences and cultural socialization (sociocultural influences). More precisely, physical characteristics such as body mass index (BMI), height, and shape can affect how an individual perceives their own body. Often, attractiveness and social acceptability of a person's appearance impact how a person is evaluated and treated by others. Childhood obesity, for example, is associated with adverse and a potentially lasting impact on body image (Schwartz & Brownell, 2002). Temperament or personality characteristics such as perfectionism and neuroticism may also influence body image because it can lead to investment in exacting physical ideals, increased drive for muscularity, or increased self-monitoring (Davis, Karvinen, & McCreary, 2005). On the other hand, some temperaments can facilitate the development of positive body image such as low neuroticism and high extraversion (Swami et al., 2008).

In addition, interpersonal experiences with family, peers, and romantic partners can influence body image development and experiences. Expectations and opinions conveyed through communication (whether verbal or nonverbal) and interactions with others can shape how individuals distinguish how others perceive them. For instance, comments and criticisms from parents provide information about the degree to which physical appearance is valued in the family. Siblings are recognized for their teasing which may also shape views of the self (Kostanski & Gullone, 2007). Friends may express the importance of appearance, especially in adolescence, and body comparisons are often made with peers (Ata, Ludden, & Lally, 2007; Ricciardelli, McCabe, & Banfield, 2000).

Furthermore, cultural socializations including cultural values (i.e., body ideals across ethnicities and cultures; Jackson, 2002) and societal ideals of beauty expressed through the mass media (Smolak, 2002) are also important influential factors. As aforementioned, cultures value different body ideals. However, modern research indicates that many cultures are turning to and embracing a thin ideal. According to Yan and Bissell (2014), the process of globalization has resulted in vast growth in trades and improved communication technology which have increased the level of integration between countries and cultures. Over time, Western media content has saturated societies and cultures worldwide with gender-specific beauty and appearance ideals that continue to gain prevalence in non-Western as well as Western societies (Connell, 2000). For example, *Men's Health* is an internationally syndicated magazine that is available in 21 countries (United States, United Kingdom, Germany, Australia, Mexico, Puerto Rico, Ecuador, Chile, Argentina, Peru, Colombia, Venezuela, Russia, the Netherlands, Finland, Denmark, Norway, Sweden, France, Italy and South Africa) and is intended to voice how men should look, dress, groom, smell, and live (Boni, 2002). In general, Westernized ideals have worn the national beauty standards in many non-Western nations including Japan, Saudi Arabia, and Brazil (Inceoglu & Kar, 2009) where the appearance norm was once quite different from that of elite Caucasian men and women (Isa & Kramer, 2003). For example, some Asian cultures that once viewed overweight as a sign of prosperity and good health are now valuing a thinner body ideal (Kawamura, 2002).

Lastly, fashion and dieting industries and the mass media intensify male and female body image ideals (Olmsted & McFarlane, 2004). In fact, the mass media is often cited as the most influential sociocultural source of pressure on body image disturbances for both men and women (e.g., Harper & Tiggemann, 2008, Labre, 2002; Levine & Murnen, 2009). Provided that the mass

media is identified as the “loudest and most aggressive purveyor of images and narratives of ideal beauty” (Groesz, Levine, & Murnen, 2001) and that research documenting media effects on men’s body image has only more recently begun (Pope, Phillips, & Olivardia, 2000), we explore the role of the mass media in more depth.

At large, the literature has identified two leading culturally-explicit, gender-specific, body shape ideals in the media: the male muscular ideal and female thin ideal (Davis, Karvinen, & McCreary, 2005). These Western cultural ideals of beauty and body shape are modelled and reinforced through different media sources on a regular basis (such as television programs, magazines, and commercials; Lawler & Nixon, 2011). Yet, the effects of the two body ideals on male audiences are far less understood and have not been explained by theory as profoundly as the literature focusing on female audiences (Slater & Tiggemann, 2014). Hence, a brief description and summary of the literature pertaining to the male muscular ideal and female thin ideal in relation to men’s body image is provided to unveil the relevant research.

The male muscular ideal. The muscular ideal is increasingly prevalent in all realms of popular media including magazines and television (Hargreaves & Tiggemann, 2009; Strother et al., 2012). Modern portrayals of the male muscular ideal emphasize broad shoulders, well-developed chest and arms, and a small waist (McCreary & Sasse, 2000). The muscular ideal consists predominantly of muscle and bone and is associated with a socially positive stereotype (Jones & Crawford, 2005). Currently, the ideal is considered to be approaching that of world-class body builders, thus representing a highly unattainable body ideal for most men (Lever, Frederick, & Peplau, 2006; Schooler & Ward, 2006).

According to Cramblitt and Pritchard (2013), the desire to increase muscle mass and alter one’s appearance is associated with exposure to specific media images in magazines (e.g., *Men’s*

Health), video games (e.g., *Grand Theft Auto*), television (e.g., music videos), and advertisements (e.g., Baird & Grieve, 2006). For example, in video games the male character is typically represented as highly muscular, excessively strong, and destructive (Dill & Thill, 2007). In comparison to the average North American male adult, the bodies of male characters in video games are proportionally larger (Martins, Williams, Ratan, & Harrison, 2011).

Moreover, Cramblitt and Pritchard (2013) found that increased time spent watching television in general resulted in an increased drive for muscularity. Hargreaves and Tiggemann (2009) found that following exposure to the muscular ideal in television commercials, men were less content with their muscle tone compared to men who were not exposed to the muscular ideal. Leit, Gray, and Pope (2002) also found that men who were exposed to commercials portraying the muscular ideal reported more muscle dysmorphia (i.e., greater discrepancy between their own perceived muscularity and the level of muscle that they ideally wish to have) compared to men who were not exposed to this ideal.

In addition, men's magazines include a high number of advertisements promoting the male muscular ideal (Andersen & DiDomenico, 1992). Fashion magazines directed toward men are increasingly featuring articles concerning topics of health, appearance, grooming, and weight loss (Duggan & McCreary, 2004). Male models featured in advertisements in magazines like *Sports Illustrated*, *Rolling Stone*, *GQ*, *Business Week*, and *Esquire* typically have strong physiques and hairless chests which powerfully reflects the male muscular ideal (Baird & Grieve, 2006; Kolbe & Albanese, 1996). Overall, many men report being unsatisfied with their physical appearance and the desire to increase muscularity, decrease weight, and decrease the amount of hair on their bodies in order to achieve and conform to the media's muscular ideal (Martins, Tiggemann, & Churchett, 2008; Tiggemann, Martins, & Churchett, 2008).

An alternative source of media that may also influence men's body image is social media. However, nearly all of the research in the area explores the effects of social networking sites on health outcomes among samples of girls and women (e.g., Perloff, 2014). Research investigating the effects of social networking platforms on men's body image is highly limited and inconsistent. For instance, Pepin and Endresz (2015) found significant correlations between Instagram use and general concerns with body image and body surveillance, as well as correlations between Pinterest use and body shame, in men. They also found significant correlations between Facebook use and perceived pressures to appear more muscular. Conversely, Kim and Chock (2015) found that simple exposure to Facebook (time spent on social media) was not related to body image concerns for men or women. Online social grooming behaviours, such as viewing and commenting on peer's profiles, were however, significantly correlated with the drive for thinness among both men and women.

Researchers recognize that social media use differs from the consumption of more traditional media formats (i.e., the mass media). In fact, the process is defined as interactive, allowing users to actively search for content and engage in particular activities. Hence, the various motives for being on different kinds of social networking sites might further mediate the effects on body image outcomes and thus, clarify the inconsistent findings pertaining to the effects of social media on men's body image disturbance. However, given that social media is examined independently from the mass media (since the experience of exposure to mass media versus social media are vastly different), we focus our attention strictly on the latter.

Overall, two recent meta-analyses based on correlational and experimental designs have established that muscular ideal images, as represented in mass media, can have a negative impact on many boy's and men's body image (Barlett, Vowels, & Saucier, 2008; Blond, 2008).

Although relatively small effect sizes, Barlett et al. (2008) found that across 15 correlational studies, pressure from the media was significantly related to negative self-images, Cohen's $d = .19$, and across 10 experimental studies, exposure to muscular ideal images also had a significant negative effect on men's body image through negative body esteem, $d = .40$, and body dissatisfaction, $d = .25$. Blond (2008) also explored the relative impact of exposure to the muscular ideal on men's body dissatisfaction. Across 15 studies using various designs, the studies yielded an average effect size of $d = .42$, thus indicating that exposure to images of ideal male bodies has a small but statistically significant effect on men's body dissatisfaction.

In addition, review articles have examined the impact of the muscular ideal on boy's and men's body image resulting in a number of health-compromising behaviours (Cafri et al., 2005; Ricciardelli & McCabe, 2004). These reviews have recognized that exposure to media portrayals of the muscular ideal often leads to detrimental behaviours including harsh dieting regimes and compulsive exercise. Due to the concerning number of consequences associated with such mass messages, scholars have emphasized the need to further understand the effects of the muscular ideal on boys and men to extend theory and provide optimal therapeutic aid.

The female thin ideal. While the increase of male muscular ideal content in the mass media is evident (Hargreaves & Tiggemann, 2009), men continue to be subject to the female thin ideal in all realms of media. In general, the female thin ideal is portrayed as slender with disproportionately large breasts and a small waist. The thin ideal has very little body fat and portrays women with dangerously thin thighs, arms, and hips (Owen & Laurel-Seller, 2000).

In men's lifestyle magazines, such as *Maxim*, *Stuff*, and *For Him Magazine* (FHM), idealized images of women appear in articles and advertisements far more often than do images of men (Ricciardelli, Clow, & White, 2010). Particular types of media are also likely to portray

women in terms of the thin ideal including video games (Dill & Thrill, 2007), popular music videos (Ward, Rivadeneyra, Thomas, Day, & Epstein, 2013), reality television productions (Zurbriggen & Morgan, 2006), and sports media (Messner, Dunbar, & Hunt, 2000), all of which are highly viewed by men. According to Buote, Wilson, Strahan, Gazzola, and Papps (2011), it is likely that the female thin ideal may also effect the cognitions, feelings, and perceptions of men and is certainly worth investigating.

Recent evidence suggests that the effects of the female thin ideal might influence, in particular, heterosexual men's body image through its influence on romantic confidence. Indeed, Aubrey and Taylor (2009) tested this premise and found that exposure to the female thin ideal increased heterosexual men's appearance-related self-consciousness largely because participants were reminded that in order to be successfully involved with women of similar attractiveness, they expressed the need to conform to strict appearance standards. Essentially, men who had an interest in, or desire to be romantically involved (whether physically or emotionally) with similar women, reported feeling romantically inadequate which, in turn, resulted in poorer self-evaluations. Alternative explanations for the effects of the female thin ideal on men's body image might also be due to an increase in psychological or physical arousal following exposure. However, the process of arousal has yet to be empirically tested and remains merely a hypothesis.

Overall, research reveals that exposure to female thin ideal images has a similar effect on men as it does on women. For instance, Lavine, Sweeney, and Wagner (1999) demonstrated that men who were exposed to advertisements that portrayed the female thin ideal evaluated their own bodies as less desirable and less attractive as well as reported larger discrepancies between actual and ideal body size compared to those who viewed the neutral advertisements. Aubrey and

Taylor (2009) found that men exposed to magazine advertisements portraying the female thin ideal reported increased appearance anxiety and more appearance-related reasons for exercising compared to those who were assigned to view the neutral content. Although there were no specific hypotheses made for men, Hargreaves and Tiggemann (2002) found that exposure to thin ideal commercials had a significant negative effect on both men and women. Not only did the participants recall significantly more commercials in the female thin ideal condition, they also generated significantly more appearance words on the word-stem completion task compared to the control group, indicating more appearance schema activation. Similarly, Hargreaves and Tiggemann (2003) found that among 13- to 15-year-old boys and girls, participants in the female thin ideal condition generated more appearance words on a word-stem completion task compared to the control group. However, only girls who viewed the thin ideal video reported significantly more body dissatisfaction compared to the control condition. Boys did not report feeling more negative about their appearance in either group.

Cikara, Eberhardt, and Fiske (2011) acknowledged that idealized images of women in the media can have deleterious consequences for both men and women's mental and physical well-being although the reasons and process in which the effects occur may be different. All together, given that ideal media images of both the male muscular ideal and female thin ideal are firmly established as sources of body image disturbance (e.g., Cash & Pruzinsky, 2002; Cikara et al., 2011; Pope et al., 2000), several theories have been developed to explain how such effects are elicited.

Theories of Media Influence

A number of theoretical perspectives are established to explain the effects of the media on body image. Though initially the theories were developed to account for women's body

image concerns, current undertakings consider the perspectives to be transferable to men (e.g., Daniel & Bridges, 2010; Morrison, Morrison, & Hopkins, 2003). For example, *social comparison theory* (Festinger, 1954) suggests that individuals use images projected in the media as standards for comparison. The theory asserts that individuals compare their own appearance with the appearance of others for self-evaluation and self-improvement purposes.

Self-schema theory (Markus, 1977) postulates that individuals have various mental representations (i.e., schemas) that develop and evolve through self-reflection and the processing of social information. The model theorizes that people who value appearance (i.e., are schematic for appearance) are particularly sensitive to appearance-related media content and therefore have a tendency to be affected more easily (Altabe & Thompson, 1996; Markus, Hamill, & Semis, 1987). Self-schema theory was the first theory to recognize that not all individuals experience body image disturbances to the same degree and that people who are highly schematic for appearance are more vulnerable to media ideals.

Self-discrepancy theory (Higgins, 1987) proposes that individuals compare themselves to internalized standards or self-guides. Hence, self-discrepancies are experienced when an individual perceives an aspect of the self falls short of their internalized standards (Bessenoff, 2006). For example, evidence reveals that exposure to thin ideal media contributes to women's body-related self-discrepancies which in turn, fosters eating-related pathologies (Harrison, 2001). Essentially, the theory posits that when self-discrepancies are experienced, an individual becomes motivated to reduce the disparity sometimes leading to risky behaviours (Szymanski & Cash, 1995).

Finally, *objectification theory* (Fredrickson & Roberts, 1997) is the leading, most comprehensive model surrounding body image (Vandenbosch & Eggermont, 2012). The theory

integrates aspects from the previously described theories including: individuals may internalize ideals (a strong component of self-discrepancy theory), individuals use ideals for comparison (similar to social comparison theory), and the theory recognizes that some individuals may be more vulnerable to body ideals than others (a key influence from self-schema theory).

Objectification theory recognizes that media portrayals of the thin ideal objectify women's bodies and emphasize the value of its distinct parts for its use by others and sexual desire. Women are socialized to adopt this perspective and in turn, experience self-objectification which often contributes to a wealth of issues including mental, physical, and cognitive health problems. Although the principles of objectification theory focus on women's body image experiences, emerging evidence shows that it may also be relevant for understanding men's body image experiences (e.g., Moradi & Huang, 2008). In addition, given that objectification theory is the only theory to explicitly propose how media body ideals affect cognitive functioning, we apply the theory to further understand men's body image and the cognitive consequences associated with media body ideals.

Objectification Theory

Fredrickson and Roberts (1997) proposed objectification theory for explaining how exposure to the female thin ideal negatively effects different dimensions of women's health. The central ideology suggests that sexual objectification occurs when a woman's body is viewed as an object that exists for the mere pleasure of others (through gazing or "checking out") rather than for its holistic, functional being. Through repeated exposure (i.e., in the media and various social contexts), girls and women become socialized to view their own physical selves as an object to be viewed and evaluated solely on the basis of physical appearance (Moradi & Huang, 2008). In general, women internalize the cultural ideal and learn to objectify their own personal

selves, known as “self-objectification”. Self-objectification is thus manifested by a constant preoccupation of the body’s appearance with a desire to achieve this ideal look. It is characterized by heightened self-monitoring of one’s appearance that, in turn, leads to negative body image evaluations and intensified body image investment (Fredrickson & Roberts, 1997; Fredrickson et al., 1998; Ryan & Morrison, 2011). Additional consequences may stem from self-objectification including depression (Szymanski & Henning, 2007), sexual dysfunction (Szymanski, Moffitt, & Carr, 2011), eating disorders (Thompson & Stice, 2001), and failure to experience peak motivational states (Slater & Tiggemann, 2002). It is important to note however, that not all women and girls self-objectify to the same degree nor in every context. Hence, self-objectification can be experienced at both the trait and state level.

Trait self-objectification develops in those who habitually internalize strict body ideal perspectives onto the self and consequently, increase the propensity to view the self in terms of ones’ external attributes rather than as a whole with integrity. Objectification theory proposes that women who are particularly prone to self-objectification (i.e., those high in trait self-objectification) will also experience an increase in self-monitoring and self-consciousness in circumstances that intensify the value of appearance.

State self-objectification is a comparable experience that is elicited or enhanced in contexts or situations that amplify an individual’s awareness of their own physical appearance such as being exposed to sexualized models in advertisements or wearing a swimsuit (Fredrickson et al., 1998). In a state of self-objectification, a woman’s consciousness is focused toward her external attributes rather than her internal characteristics and abilities. State self-objectification is conceptually similar to Cooley’s (1902) “looking glass self” which posits that individuals define themselves through the imagined judgements of others. Essentially, people

shape their self-image based on how they think others observe and perceive them. Individuals tend to conform to the self they believe others see them as, even if their vision is inaccurate. Likewise, objectification theory maintains that individuals internalize an outsider's perspective, or more likely, the broader cultural perspective. Although trait self-objectification is chronic and is associated with a number of negative consequences (e.g., eating disorders; Gay & Castano, 2010), state self-objectification is short lived, can be manipulated in the laboratory, and can influence a variety of outcomes including behaviour, affect, and cognition.

Theoretically and conceptually, in a state of self-objectification an individual is preoccupied, at least in part, by their own external attributes (Fredrickson & Roberts, 1997). Hence, self-objectification often leads to disruptions in focused attention for alternative tasks and thus, poorer cognitive performance (Fredrickson et al., 1998; Gay & Castano, 2010; Moradi & Huang, 2008). Please refer to *Figure 1* for a conceptual diagram of objectification theory.

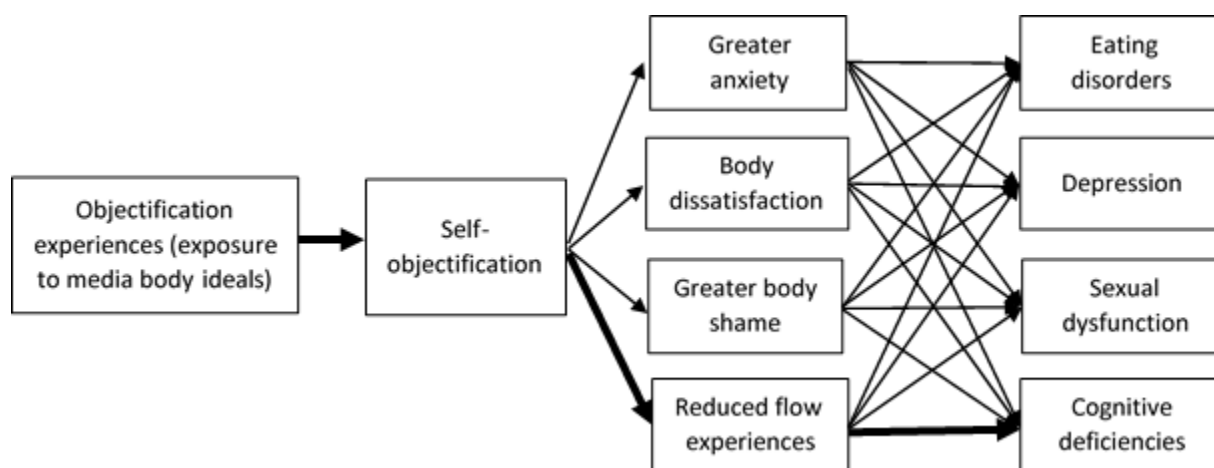


Figure 1. Objectification theory framework. Adapted from “Objectification Theory and Psychology of Women: A Decade of Advances and Future Directions,” by B. Moradi and Y. Huang, 2008, *Psychology of Women Quarterly*, 32, p.378. Copyright 2008 by the American Psychological Association.

Note. The thick paths highlight the variables and hypotheses pertinent to this dissertation.

Consistent with this premise, Fredrickson and colleagues (1998) demonstrated that women who wore a swimsuit (versus a sweater) and viewed themselves in a mirror elicited self-objectification, which in turn, resulted in poorer performance on a math test. Quinn, Kallen, Twenge, and Fredrickson (2006) tested the same premise with an alternative task because math requires practise in order to be able to perform well. They hypothesized that self-objectification would lead to reduced attentional resources on a Stroop task measuring processing proficiency. Indeed, women in the swimsuit condition had longer reaction times during the Stroop task compared to those in the sweater condition because they experienced increased interference in attentional processes.

Gapinski, Brownell, and LaFrance (2003) also used the swimsuit versus sweater manipulation to test motivation and cognitive performance. They employed three tests from the Kit of Factor-Referenced Cognitive Tests (Ekstrom, French, Harman, & Derman, 1976). Gapinski et al. (2003) applied the Gestalt Completion Test (i.e., participants had to identify partially degraded images of various objects such as an image of a telephone with many of the lines from the image removed) to measure speed of closure, the Nonsense Syllogisms Test (i.e., participants had to evaluate whether or not the third sentence of each item followed logically from the first two such as “no chipmunks are clowns. Some mushrooms are chipmunks. Therefore, some mushrooms are not clowns”) to measure logical reasoning, and finally the Surface Development Test (i.e., participants visualized how a flat piece of paper can be folded into a three-dimensional object) to measure visual-spatial orientation. They found that women high on trait self-objectification in an objectified condition experienced less intrinsic motivation and diminished cognitive performance on the visual-spatial orientation task and logical reasoning measure compared to women low on trait self-objectification.

Furthermore, Tiggemann, Hargreaves, Polivy, and McFarlane (2004) found that women in a self-objectification condition reported more appearance words on a word-stem completion task compared to those in the neutral condition thereby suggesting implicit selective processing of information. Tiggemann and Boundy (2008) explored the effects of four conditions: the neutral condition (ordinary room; no compliment), compliment condition (ordinary room; received an appearance compliment), appearance-focused condition (room contained two full-length mirrors, set of bathroom scales, and a display of fashion magazines; no compliment), or objectified condition (room contained two full-length mirrors, set of bathroom scales, and a display of fashion magazines; received an appearance compliment) on cognitive performance using a sample of college-aged women. They assessed logical reasoning and visual-spatial orientation using two tasks from the Kit of Factor-Referenced Cognitive Tests (Ekstrom et al., 1976). The cognitive measures included the Nonsense Syllogisms Test to measure logical reasoning (previously defined) and the Cube Comparisons Test (i.e., participants were required to mentally rotate a pair of cubes with letters and symbols on each face to determine whether the pair were the same or different) to assess visual-spatial orientation.

Their findings revealed nonsignificant results in terms of the cognitive functioning variables across all four groups (Tiggemann & Boundy, 2008). In addition, the conditions did not elicit state self-objectification except among women high on trait self-objectification who may have been more sensitive to the subtle environmental manipulations. Their limitations suggested that the conditions were likely too subtle to induce a state of self-objectification. Nevertheless, taken together, both trait and state self-objectification can affect women's cognitive functioning thus supporting the principles of objectification theory.

Evidence Supporting Men's Self-Objectification

Overall, objectification theory has received extensive empirical support (e.g., Calogero, 2011; Heimerdinger-Edwards, Vogel, & Hammer, 2011; Moradi, 2010; Moradi & Huang, 2008), but at this time primarily accounts for the experiences of women. Recently, however, researchers propose objectification theory to explore men's body image disturbance given the media's escalated emphasis on men's appearance (Gill, Henwood, & McClean, 2000; Pope et al., 2001) and the rising tendency to objectify men's physiques (Johnson, McCreary, & Mills, 2007; Rohlinger, 2002).

In line with this premise, Tiggemann and Kuring (2004) found that depressed mood and disordered eating were indeed consequences of self-objectification among a sample of college men. Arbour and Ginis (2006) found that media induced self-objectification was related to body dissatisfaction in men. Strelan and Hargreaves (2005) demonstrated that media induced self-objectification was also negatively correlated with self-esteem, general well-being, and body satisfaction, while positively related to appearance-related reasons for exercise among men. Rollero (2013) recently found that a short 3-minute muscular ideal video induced self-objectification and in turn, decreased men's positive affect. Oehlhof, Musher-Eizenman, Neufeld, and Hauser (2009) found that higher self-objectification scores were related to increased desire for muscularity.

Nevertheless, the relationship between self-objectification and men's body image outcomes sometimes provides mixed results. For example, based on findings from several studies, self-objectification appears to have a significant positive association with the drive for muscularity (e.g., Hallsworth, Wade, & Tiggemann, 2005; Martins, Tiggemann, & Kirkbride, 2007). Yet in other studies, self-objectification is weakly (Schwartz et al., 2010) or negatively (Daniel & Bridges, 2010) associated with the drive for muscularity. Similarly, Grieve and

Helmick (2008) conducted a survey study and found that men who scored high on self-objectification indicated a greater drive for muscularity and more symptoms of muscle dysmorphia compared to men who scored low on measures of self-objectification. However contrary to the theory, there were no significant differences between those who scored high versus low on self-objectification and measures of body satisfaction and self-esteem.

Although conflicting perspectives give grounds to further explore the application of objectification theory to explain men's body image, most evidence supports the notion that men's body image disturbances are, in part, influenced by media induced self-objectification. Researchers in the area welcome new studies to further examine the effects of self-objectification on men's psychological and cognitive consequences to justify and extend the theory (e.g., Heimerdinger-Edwards, Vogel, & Hammer, 2011).

Motivation: A Potential Moderator of Body Image Outcomes

As revealed in the literature, men's body image research is also limited in scope with regard to the identification of moderating factors (Levine & Murnen, 2009). Hence, it is important to distinguish for which types of people media body ideals elicit self-objectification and other adverse effects. Recent evidence suggests that the association between exposure to media body ideals and body image outcomes such as poor self-evaluations and body dissatisfaction may be moderated by an individual's general motivation (e.g., Mask, Blanchard, & Baker, 2014), thereby elucidating why not all men experience negative effects.

From the broadest perspective, motivation drives human behaviour and provides reason for people's actions, desires, and needs. Humans are ultimately motivated and goal-oriented to seek out specific ends ranging from personal goals, like achieving the muscular ideal, to universal needs like obtaining food (Ryan, 2012). Fundamentally, motivation comes in many

forms and changes sporadically over time depending on the conditions, context, individual's personality and mood. While some scholars propose dualistic motivation theories, which divide motivation into two types, intrinsic and extrinsic, many contemporary scholars use multifaceted theories which recognize a number of distinct behaviour regulations that range on a continuum from highly controlled (i.e., extrinsic) to highly autonomous (i.e., intrinsic) to explore performance, behaviour, and emotion (Reiss, 2012). Self-determination theory (Deci & Ryan, 1985) is a well-recognized, multifaceted motivation theory that has been applied to a great extent to explain participation, performance, and emotions in various contexts such as school, work, relationships, and physical exercise, to name a few (Deci & Ryan, 2008).

Consistent across the motivation literature, more autonomous types of motivation promote better performance and health outcomes in various life domains compared to more controlled types of motivation, which often undermine performance and well-being (Deci & Ryan, 2002). This is because types of motivation are driven by different sources of behaviour regulation that are integrated into the self to differing degrees. When the reason to act transpires from the self, the individual takes ownership of his/her actions and thus experiences a feeling of freedom and authenticity in their enactment. In contrast, extrinsic motivation is driven by behaviour regulations that reside outside of the self, such as messages in the media, thus experiencing a sense of pressure to enact. Given that motivation types have distinct consequences, research has proceeded to explore the moderating roles of different motivation regulations in order to further understand the impact of motivation in various health compromising contexts. We therefore apply self-determination theory to explore the moderating roles of autonomous and controlled motivation on men's body image outcomes following exposure to media body ideals.

Self-Determination Theory

Self-determination theory (Deci & Ryan, 1985) was integrated in the current research program to help identify who may be more vulnerable to or more protected from experiencing self-objectification and the cognitive effects associated with media portrayals of the muscular and/or thin ideal. Quite generally, self-determination theory posits that people engage in various behaviours and activities for different reasons (Deci & Ryan, 1985). According to Deci and Ryan (2002, 2008), the reasons for engaging in a particular behaviour are reflected in the degree to which the motive to act is internalized into the self. Based on this premise, there are six styles of behaviour regulation that vary along a continuum of perceived autonomy or self-determination. From the most self-determined (highly autonomous) to the least self-determined (highly controlled) style of behaviour regulation they include; intrinsic regulation, integrated regulation, identified regulation, introjected regulation, external regulation, and amotivation.

Intrinsic regulation is characterized by voluntarily engaging in an activity for the mere pleasure and satisfaction of performing the activity. Integrated regulation transpires when behaviours are performed because they express one's deepest values and principles and becomes part of the individual's sense of self. Identified regulation evolves when behaviours are performed because they are consciously valued and deemed personally important. Introjected regulation refers to motives that develop from self-imposed pressures like shame or guilt. External regulation is characterized by behaviours that are enacted to obtain a reward or avoid an undesirable outcome (Deci & Ryan, 2002). Introjected and external behaviour regulations are not self-determined because the regulations are not integrated into the self. The last category of motivation, amotivation, is to be without behaviour regulation and characterized by non-valuing and non-intentionality. In other words, when amotivated, a person feels that their behaviour is

caused by forces beyond their control and this in turn leads to a sense of alienation and depression (Deci & Ryan, 2000).

Together these six styles of behaviour regulation are differentiated along a continuum of self-determination and can explain individual differences in motivation, actions, and emotions in almost any given situation. Research has shown that more autonomous styles of behaviour regulation (i.e., intrinsic regulation, integrated regulation, and identified regulation) are associated with positive outcomes such as increased self-esteem and well-being (see Deci & Ryan, 2000, 2002, 2008 for complete reviews). By contrast, controlled styles of behaviour regulation (i.e., introjected regulation, external regulation, and amotivation) are associated with more negative outcomes such as low self-esteem and poor performance in sports, school, and work (Deci & Ryan, 2000). Fundamentally, individuals encompass a dispositional level of both autonomous and controlled motivation which consequently, influences a person's enduring motivational orientation toward his or her everyday activities.

At the dispositional level, an autonomous motivation orientation reflects a sense of self that is integrated and free of will. Behaviours are experienced as authentic and enjoyable (Ryan & Deci, 2000). An autonomous motivation orientation in life is posited to lead people to interpret relevant everyday stimuli as inputs of information which are then evaluated against the interests and values of the self in order to determine the best course of action. For example, having an autonomous motivation orientation is associated with greater adherence in physical activity programs like aerobics and Tae Kwon Do (Ryan, Frederick, Lipes, Rubio, & Sheldon, 1997), and successful weight loss in long-term weight loss intervention programs (Silva et al., 2011).

On the other hand, a more controlled motivation orientation reflects a more fragmented sense of self, and behaviours are experienced as controlled or pressured because they are not

self-endorsed. Individuals who experience a controlled orientation are generally sensitive to discrepancies both within themselves and in their social environment leading them to perceive and interpret relevant events or stimuli as inputs of pressure to behave a certain way. Stimuli or incoming information are therefore evaluated against socially prescribed ideals rather than personal values and interests. For example, a controlled motivation orientation is associated with experiencing more pressure to conform to media body ideals and greater body dissatisfaction (Mask & Blanchard, 2011b).

Pelletier, Dion and Levesque (2004) first applied self-determination theory to the study of women's body image consequences. Given that societal ideals surrounding women's appearance and body size appear to be a strong external motive for many girls, they hypothesized that girls with less self-determination (i.e., less autonomous motivation) would have a tendency to be affected by such external motives compared to girls with more self-determination (i.e., more autonomous motivation). Among their sample of college women, they found that women high in global self-determination perceived less sociocultural pressures to be thin, and engaged in less disordered eating compared to women low on global self-determination. Later, Pelletier and Dion (2007) found that women high in autonomous motivation reported more autonomously regulated eating behaviours and less controlled forms of eating regulation.

Furthermore, Mask and Blanchard (2011a) found that following a thin ideal video manipulation, women who reported less self-determination demonstrated more perceived pressure from the media to be thin, greater body dissatisfaction, and greater concerns over quantity of food consumed compared to women who reported more self-determination in the same video condition and women who viewed the neutral video. Mask, Blanchard, and Baker (2014) also found that after exposure to a thin ideal video, women low on self-determination

rated their appearance and competence more harshly and reported more guilt-related reasons for regulating their consumption of chocolate compared to those who were high on self-determination. According to Pelletier et al. (2004), girls and women who do things for more external incentives are generally those who experience greater depression, more body shame, greater body dissatisfaction, and increased appearance anxiety. Overall, findings suggest that the more an individual is self-determined in life, the more motivated they may be to act in accordance with their own values and beliefs rather than respond to sociocultural pressures external to the self.

Evidently, not all individuals respond to sociocultural pressures in the same way nor to the same extent. A highly autonomous motivation orientation in life could conceivably act as a buffer against sociocultural influences like the media and hence, reduce the risk of experiencing body image-related disturbances. On the other hand, a controlled motivation orientation might predict who is more vulnerable to the negative effects associated with muscular and thin ideal media. In order to explain why some men may be more resistant to the detrimental effects associated with the media than others, the current dissertation integrates self-determination theory to test the potential protective role of autonomous motivation and possible detrimental role of controlled motivation.

Contribution and Goals of the Present Dissertation

The review of the literature reveals that there is a lack of research exploring the effects of media body ideals on men's body image consequences especially in relation to the cognitive effects. The main research question of this program was therefore to determine whether media body ideals (i.e., the muscular and thin ideal) affect men's cognitive functioning. We aimed to answer this question and contribute to this domain by investigating the effects of two distinct

commercial videos on men's appearance schema, visual-spatial processing, and information processing proficiency. We hypothesized that both the thin ideal and muscular ideal videos would have a negative impact on men's implicit information processing, visual-spatial processing, and processing proficiency compared to men who were exposed to a neutral video.

The second main research question explored how or through what psychological process media body ideals, in particular the male muscular ideal, influence men's cognitive functioning. To answer this question, we applied a comprehensive model, objectification theory, to investigate the process of self-objectification. We hypothesized that men who were exposed to the muscular ideal would experience increased self-objectification which in turn, would influence increased appearance schema activation (i.e., implicit information processing) compared to those in the neutral condition.

The third main research question asked for whom did the muscular and/or thin ideal exert a stronger or weaker effect on men's cognitive functioning. Given that not all men respond to media body ideals to the same extent, we applied self-determination theory to investigate the potential protective role of autonomous motivation and potential detrimental role of controlled motivation on men's subsequent cognitive functioning following a video manipulation. We hypothesized that men who encompassed an autonomous motivation orientation would be protected from the aforementioned adverse cognitive effects after exposure to media body ideals whereas, men who reported a controlled motivation orientation would be more vulnerable to the effects and therefore demonstrate poorer cognitive functioning following exposure to media body ideals.

More specifically, in light of the fact that recent efforts indicate that ideal media images can have negative effects on men's emotional, psychological, and physical health, the current

research program contributed to the domain by investigating the effects on cognitive functioning and cognitive performance. We assessed the effects of the *muscular ideal* on men's cognitive functioning using three separate cognitive tasks (Manuscript 1). In addition, we assessed objectification theory to investigate whether men self-objectify and if so, whether self-objectification contributed to poor cognitive functioning thereby explaining how particular media content elicits changes in cognition. Hence, we verified the *mediating* role of self-objectification between exposure to the muscular ideal and men's cognitive processing. Additionally, we assessed the impact of the *thin ideal* on men's cognitive functioning and self-evaluations (Manuscript 2). To address the proposed research goals, we used a self-determination theory framework to investigate the roles of two well-documented motivational constructs, namely, autonomous and controlled motivation orientation. In order to examine the potential protective factors associated with body image as well as factors that increase susceptibility to body image disturbance, we integrated the theory to help explain why some men might be more resilient to media body ideals compared to others. Accordingly, we assessed the *moderating* roles of autonomous and controlled motivation orientation on self-objectification and cognitive functioning in the context of men's body image (Manuscript 1 & 2).

Ultimately, two very distinct media portrayals (i.e., the male muscular ideal and female thin ideal) were used to investigate the effects of media body ideals on men's cognitive functioning and self-objectification through the lens of the two-forementioned dispositional motivational constructs. The findings from the two manuscripts are intended to significantly contribute to our understanding of the effects of media body ideals on men's cognitive functioning and performance as well as provide insight into the potentially protective role of an autonomous motivation orientation. Moreover, it is our hope that the findings will inspire future

researchers to incorporate motivational constructs into models exploring men's body image to help investigators and practitioners better recognize who may be more or less susceptible to body image disturbances provoked by media body ideals.

To summarize the research program, Manuscript 1 included three cross-sectional studies, one survey and two experimental studies, where male university students completed a survey, watched a randomly assigned video (either the muscular ideal or neutral video), and engaged in a cognitive task. The focus of Manuscript 1 was on the effects of a muscular ideal manipulation, compared to a neutral condition, on men's 1) cognitive functioning and 2) state self-objectification. To further understand the effects, we examined the moderating role of motivation orientation. In Study 1, the objectives were first, to uncover the relationship between muscular ideal video exposure and appearance schema activation (i.e., an indication of selective information processing) as a function of self-objectification, and second, to determine whether the effect is moderated by autonomous and controlled motivation orientation. Hence, we proposed a moderated mediation model. In Study 2, the goals included analyzing the effects of the same muscular ideal video versus neutral video on state self-objectification and on men's cognitive performance using a Soma puzzle activity (i.e., assessing visual-spatial processing). We also aimed to test whether the effect on cognitive performance was moderated by autonomous and controlled motivation orientation. We employed an independent samples *t*-test to compare state self-objectification across video conditions and two separate multiple moderation models to test the moderating effects of motivation orientation on cognitive performance. In Study 3, the goals included analyzing the effects of the same muscular ideal video versus neutral video on men's cognitive performance using a Modified Stroop task (i.e., measuring processing speed). Again, we tested whether the effect on cognitive performance were

moderated by autonomous and controlled motivation orientation. Two multiple moderation models were utilized to test each outcome variable.

Manuscript 2 included two cross sectional studies, one survey and one experimental study using a similar design and procedure as Manuscript 1. Manuscript 2 applied a thin ideal video condition instead of a muscular ideal video. Consequently, objectification theory was omitted because it applies thin ideal issues with body image concerns for women. Given that the literature on the effects of the thin ideal on men's body image in general is underdeveloped, our primary objective was to contribute to this realm of research by investigating the effects of the thin ideal, compared to the neutral condition, on men's 1) cognitive functioning and 2) self-evaluations. The moderating role of dispositional autonomous and controlled motivation orientation was also examined. In Study 1, the objectives were to explore the effects of the thin ideal on appearance schema activation (or implicit information processing) and to assess whether the effects were moderated by autonomous and controlled motivation orientation. In Study 2, the goals included exploring the effects of the thin ideal video versus neutral video on men's visual-spatial processing (using a Soma puzzle task) and body esteem while incorporating the moderating roles of autonomous and controlled motivation orientation. Both studies employed independent samples *t*-tests and multiple moderation models.

The two manuscripts are included in the next sections of the dissertation followed by a General Discussion of their findings including theoretical and practical implications.

Running head: MEDIA, MOTIVATION, AND MEN'S COGNITIVE FUNCTIONING

The Protective Role of Autonomous Motivation against the Effects of the “Muscular Ideal” on
Men's Self-Objectification, Appearance Schema Activation, and Cognitive Performance

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Abstract

Two theoretical frameworks, namely, objectification theory and self-determination theory, were applied to explore men's body image consequences. The objective of the research was to identify and understand whether self-objectification (i.e., mediator) and motivation orientation (i.e., autonomous versus controlled; moderators) influenced men's cognitive functioning following exposure to advertisements portraying the male muscular ideal. Hence, we aimed to 1) test an original moderated mediation model to further understand the complexities of men's body image outcomes and 2) assess the moderating roles of autonomous and controlled motivation to understand its potential relationship with men's body image. To test our models, we explored whether the muscular ideal, compared to the neutral video group, negatively affected men's cognitive functioning using three different cognitive tasks intended to measure appearance schema activation (Study 1), visual-spatial processing (Study 2), and processing proficiency (Study 3). Results showed that the muscular ideal induced a state of self-objectification among men, which in turn, mediated viewer's levels of appearance schema activation. Findings also revealed that autonomous motivation moderated the effects. High levels of autonomous motivation played a protective role on viewer's cognitive performance on all three mental tasks, whereas controlled motivation did not predict any relationships. Implications and future directions are discussed.

Keywords: Media effects, advertising, Objectification Theory, men's cognitive functioning, Self-Determination Theory

The Protective Role of Autonomous Motivation against the Effects of the “Muscular Ideal” on Men’s Self-Objectification, Appearance Schema Activation, and Cognitive Performance

Existing research advocates that media body ideals have become a prominent source of pressure for men (Field et al., 2014; Murray & Touyz, 2012). In fact, portrayals of the male muscular ideal in Western culture are increasingly affecting men’s emotional (e.g., negative mood; Agliata & Tantleff-Dunn), psychological (e.g., body dissatisfaction; Blond, 2008), and physical health (e.g., extreme exercising; Barlett, Vowels, & Saucier, 2008). While research is proliferating in the realm of men’s body image (e.g., Dakanalis et al., 2015b; Mitchison et al., 2016; Slater & Tiggemann, 2014; Schuster, Negy, & Tantleff-Dunn, 2013; Schwartz, Grammas, Sutherland, Siffert, & Bush-King, 2010), we know little about the effects of media body ideals on men’s cognitive functioning and cognitive performance. Though efforts are emerging (e.g., understanding the impact of body ideals on attention; Cho & Lee, 2013, and math performance; Hebl, King, & Lin, 2004), the literature remains meagre. For this reason, we aim to explore the effect of a muscular ideal video on men’s cognitive functioning using three separate studies.

In order to advance research in the domain, we integrated two theories to help conceptualize our proposed models. First, we applied objectification theory to elucidate through what *process* (i.e., mediation) do media body ideals effect men’s cognitive functioning. We explored whether self-objectification would explain how the muscular ideal exerts its affect on men’s cognition - a research objective that has not been previously explored. Second, we applied self-determination theory to identify *who* (i.e., moderation) might be more vulnerable to, or protected from, experiencing self-objectification and decreased cognitive functioning following exposure to the muscular ideal. Given that not all men are affected by media body ideals to the

same extent, we explored whether an autonomous versus controlled motivation orientation would help distinguish who might experience weaker or stronger media body ideal-related effects.

A review of each theory is provided below along with a brief description of their connection to body image as well as each other.

Objectification Theory

Fredrickson and Roberts (1997) developed objectification theory to explain how the media exerts its detrimental effect on women's emotional, psychological, physical, and cognitive health. The theory contends that through repetitive exposure, girls and women internalize societal ideals that reduce the female body to mere objects subject to other's evaluations. As a result of this internalization, girls and women may become socialized to take a similar perspective toward their own appearance thus instigating "self-objectification" (i.e., an increased preoccupation with one's own physical appearance). The theory recognizes that although not all women self-objectify to the same degree, the consequences can nevertheless be severe. Based on a review of the literature, the consequences associated with self-objectification include increased feelings of shame, appearance anxiety (Fredrickson, Roberts, Noll, Quinn, & Twenge, 1998; Grabe, Ward, & Hyde, 2008), body dissatisfaction, low body esteem, depressed mood, and eating disorder symptoms (Calogero et al., 2005; Moradi et al., 2005; Tiggemann & Kuring, 2004; Tiggemann & Lynch, 2001).

Of importance, self-objectification can also disrupt attention and interrupt cognitive resources that are necessary for alternative tasks such as logical reasoning (e.g., math performance; Fredrickson et al., 1998; Gapinski, Brownell, & LaFrance, 2003), information processing (e.g., appearance schema activation; Hargreaves & Tiggemann, 2003), processing

proficiency (e.g., Stroop task performance; Quinn, Kallen, Twenge, & Fredrickson, 2006), and visual-spatial processing (Riva, 2014).

Despite the fact that objectification theory was developed to explain women's body image concerns, some researchers assert that self-objectification is not an experience confined to women. For example, Calogero (2009) found that self-objectification was directly related to disordered eating behaviors in men. Tiggemann and Kuring (2004) found that self-objectification predicted depressed mood for both men and women. Karazsia and Crowther (2009) found that internalization of societal ideals and self-objectification were significantly associated with muscularity dissatisfaction in men. Hebl et al. (2004) found that both men and women of diverse ethnicities performed more poorly on a math test in a state of self-objectification compared to those in the neutral condition. Slater and Tiggemann (2010) found that self-objectification was significantly related to body shame, appearance anxiety and disordered eating in adolescent boys.

Several studies have also investigated self-objectification as a mediator for health outcomes among men. For example, Heath, Tod, Kannis-Dymand, and Lovell (2016) found that internalization of the muscular ideal mediated body surveillance through self-objectification. Parent and Moradi (2011) found the same mediating effect on body shame. A recent three-year longitudinal study (Dakanalis et al., 2015a) found that internalization of the muscular ideal predicted self-objectification one year later, which in turn, predicted increased body shame and appearance anxiety a year after that.

On the contrary, few studies in opposition suggest that objectification theory may not be suitable for explaining how the media contributes to negative body image in men. Fredrickson et al. (1998) found that self-objectification increased body shame, which in turn predicted restrained eating in women but not in men. They also found that self-objectification diminished

math performance for women but not men. Hargreaves and Tiggemann (2004) revealed that exposure to a muscular ideal video did not predict self-objectification or body dissatisfaction among boys. Daniel and Bridges (2010) found that exposure to a muscular ideal video had no relationship with men's self-objectification or drive for muscularity. Consequently, additional research is required to test the principles of objectification theory for explaining men's body image outcomes.

Overall, objectification theory might explain, at least in part, how exposure to muscular ideal advertisements (ads) elicit adverse cognitive effects in men. The present studies therefore aimed to assess whether self-objectification plays a mediating role on men's cognitive functioning following exposure to a muscular ideal video manipulation.

However, given that objectification theory recognizes that not all persons experience self-objectification to the same extent, we considered the notion that some people might be protected from internalizing media body ideals and hence, protected from experiencing a decrease in cognitive functioning. On the contrary, some people might be more susceptible to self-objectification and diminished cognitive functioning following exposure to the muscular ideal. In order to address the potential moderating factors, we included constructs from self-determination theory (i.e., autonomous and controlled motivation orientation). The motivational framework coupled with objectification theory is appropriate for our proposed model because empirical evidence suggests that motivation orientation influences whether people internalize or integrate external pressures like media body ideals. Therefore, motivation orientation might influence the degree of self-objectification experienced in men as well as their cognitive functioning.

Autonomous and Controlled Motivation Orientation in Relation to Body Image

According to Deci and Ryan (1985, 2002), self-determination theory postulates that individuals embody global levels of both autonomous and controlled motivation which influence their everyday behaviors and orientation toward activities. Although situations and contexts can impact an individual's motivation at a given moment, global levels are generally more stable over time (Vallerand & Ratelle, 2002) and supports the regulation of motivation across different life domains and contexts (Vallerand, 2000). For instance, a globally autonomous person, in general, is likely to be autonomously motivated in various contexts such as school, leisure, and work.

By definition, global autonomously motivated persons primarily live their lives free of will by choosing what to engage in. They often chose to participate in behaviors or activities for the mere pleasure and satisfaction they bring. Though from time to time, these individuals may engage in behaviors or activities for reasons beyond mere pleasure, this does not transform their global motivation orientation in life. Hence, given the degree of self-determination experienced by autonomously oriented persons, it is presumed that when these individuals encounter events or stimuli in their everyday lives (like messages portrayed in the media) they may choose to engage in the event or with the stimuli, but choice is entirely under their discretion. When circumstances or stimuli (like some media messages) are undesirable, these persons might regulate their emotions, perceptions, and behaviors thereby averting any negative effects (Perreault, Mask, Morgan, & Blanchard, 2014). Evidence suggests that autonomous motivation is indeed associated with better emotional regulation, less perceived pressure to conform to media body ideals, and less disordered eating (Mask & Blanchard, 2011a).

Conversely, a more controlled motivation orientation is experienced when a person engages in a behavior or activity for externally regulated reasons like obtaining an award or

avoiding a punishment, and internally regulated reasons like avoiding guilt. Hence, control oriented individuals experience less self-determination and thus, behaviors are often governed by extrinsic factors. These individuals perceive external demands and socially constructed ideals as reasons to do things in general. For instance, ideal media images may be perceived and interpreted as a source of pressure to conform. Based on current research, a controlled motivation orientation is associated with experiencing more pressure to conform to beauty ideals and increased body dissatisfaction (Mask & Blanchard, 2011b).

The constructs of global autonomous and controlled motivation are applied in a number of studies exploring the effects of media body ideals on women's body image since cultural ideals are considered a strong external motive for many women. Specifically, Pelletier, Dion, and Levesque (2004) found that women low on autonomous motivation perceived more sociocultural pressures to be thin and engaged in more disordered eating compared to women who scored high on autonomous motivation. Mask and Blanchard (2011b) revealed that following exposure to a female thin ideal video, women's perceptions of pressure to be thin, body dissatisfaction, and concerns over quantity of food intake were greater for control oriented women compared to autonomous oriented women. Mask, Blanchard, and Baker (2014) found that control oriented women evaluated their appearance and competence more negatively following exposure to a female ideal video compared to autonomous oriented women. Evidently, an autonomous motivation orientation plays a protective role against the negative consequences associated with media body ideals while high levels of controlled motivation orientation predict increased vulnerability.

Similarly, an autonomous motivation orientation is associated with feelings of "flow" (a state of focused engagement and enjoyment) and optimal cognitive performance. On the other

hand, a controlled motivation orientation is associated with decreased performance and poor goal progress because extrinsic motives tend to undermine competence. Given the beneficial nature of autonomous motivation and the detrimental nature of controlled motivation on cognitive functioning and performance (Deci & Ryan, 2002; Vallerand, 2000), we aim to explore these global motivation constructs on men's cognitive functioning in the context of media body ideals.

The Present Studies

Across three studies, the overall aim was to identify and understand whether self-objectification (i.e., mediation) and motivation orientation (autonomous versus controlled; i.e., moderation) influence men's cognitive functioning following exposure to ads portraying the male muscular ideal.

Overall, Study 1 was designed to explore the effects of the muscular ideal video, compared to the neutral video, on men's appearance schema activation using a word-stem completion task. We also included measures of self-objectification and motivation orientation to further understand their roles in our moderated mediation model. We hypothesized that men in the muscular ideal video condition and who had a controlled motivation orientation, would experience increased self-objectification and, in turn, increased appearance schema activation. However, we hypothesized that men who had an autonomous motivation orientation, would be protected from experiencing such negative effects following media exposure. Study 2 explored the effects of the same muscular ideal video, compared to neutral video, on men's visual-spatial processing using a Soma puzzle task. We included motivation orientation to test the roles of autonomous and controlled motivation on men's cognitive performance. Similarly, we hypothesized that men who reported an autonomous motivation orientation would be protected from experiencing poorer cognitive functioning following the muscular ideal video compared to

men who report a controlled motivation orientation. Finally, Study 3 investigated the effect of the same muscular ideal video, compared to neutral video, on men's information processing speed using a Modified Stroop task. We included motivation orientations in the model to further test the potential protective role of autonomous motivation and possible detrimental role of controlled motivation on cognitive performance. Prior to testing our hypotheses regarding mediation and moderation, a pre-study was included to assess the reliability of the muscular ideal video before integrating the manipulation in all three studies.

Pre-Study

A manipulation check was conducted on the experimental video to ensure that the content portrayed the male muscular ideal and focused on the appearance of male models.

Method

Participants. Male students from the University of Alberta participated on a voluntary basis ($N = 45$). Participants age ranged between 17 and 30 years with the majority between the ages of 26 and 28 (55.6%), followed by 23-25 (24.4%), 20-22 (8.9%), 17-19 (6.7%), and 29-30 years (4.4%). The majority of participants reported being White (80%), followed by Asian (6.7%), African Canadian (4.4%), and other (8.9%). The majority reported being heterosexual (91.1%) and few identified as gay (6.7%) or bisexual (2.2%).

Experimental stimuli and procedure. Two 5-minute videos were created (i.e., the muscular ideal and neutral video) with ads from YouTube. In order to create the male muscular ideal video, strict guidelines were followed including: the ads had to (1) showcase appearance-based attributes of the male body such as abdominals and biceps, (2) emphasize the importance of having an appealing physique, (3) feature men posing for the camera to show-off muscle and build, or engaging in a physical activity to demonstrate the nature of being strong, and (4) could

not feature any female counterpart. The final video included a total of nine ads: three ads neutral in content to mask the true nature of the video and six ads that focused on appearance-based attributes of the male body. Sample ads included Calvin Klein briefs, Gillet razor, Versace cologne, and Old Spice body wash. Provided that White men appear more often in male advertisements (i.e., 60-70% of the time; Lopez-Coleman, 2017), we included two ads that portrayed at least one African American and the remaining 4 ads portrayed White men. In addition, nine ads were used to create the neutral video. Ads were required to display neutral content (i.e., products that did not advertise appearance-related merchandise) and minimal images of humans. Sample ads included Pedigree dog food, Tide laundry detergent, Staples stationary supplies, and Charmin tissue paper. The ads had no relation to appearance and drew attention toward the product.

Participants were exposed to the six muscular ideal ads prior to completing the survey. After the video, men responded to a few demographic questions, rated their perceptions of the video's content, and were assessed on state self-objectification.

Measures.

Perceptions of muscular ideal video content. Participant's perceptions of the six appearance-focused ads were assessed using a 10-item survey (Mask, Blanchard, & Baker, 2014). Sample items included "the ads emphasized the appearance of men's bodies" and "the ads portrayed men as decorative objects to sell the product" ($\alpha = .95$). Responses were rated from 1 (*strongly disagree*) to 7 (*strongly agree*).

State self-objectification. Following exposure to the muscular ideal ads, participants were asked to indicate to what extent "the ads in the video made you self-conscious or think about your own ____" (Mask et al., 2014). The following appearance-based attributes assessed how

well the video instigated state self-objectification: sexual appeal, physical attractiveness, measurements (i.e., chest, arms, waist), overall appearance of your body, shape/figure, how certain parts of the body looked (i.e., biceps, stomach, thighs, upper back), and weight ($\alpha = .94$). Responses ranged from 0 (*not at all*) to 6 (*very much so*).

Results

Manipulation check for the portrayal of the muscular ideal. A principle components analysis supported a one-factor solution which accounted for 73.21% of the total variance across survey items. Responses were then averaged together across the ten items and evaluated against the scales mid-point of 4. Perceptions of the muscular ideal content in the ads were supported ($M = 5.08$, $SD = 1.15$), $t(44) = 6.35$, $p < .001$.

Manipulation check for eliciting state self-objectification. The survey items were subject to a principal component analysis. The initial solution revealed a one-factor component which accounted for 76.74% of the total variance. Responses were then averaged together across the seven items and evaluated against the scales mid-point of 3. The video successfully induced a state of self-objectification among viewers ($M = 3.86$, $SD = 1.75$), $t(44) = 3.31$, $p = .002$. Given that the ads highlighted the muscular ideal and encouraged men to think about their own body, we included the ads in the final muscular ideal video for the subsequent three studies.

Study 1

Study 1 aimed to first, explore the effects of the muscular ideal video on men's appearance schema activation using a between-subjects cross-sectional online survey design. Second, we tested the role of self-objectification as a mediator to potentially explain how the video elicited its affect on men's cognitive functioning. Third, we integrated autonomous and controlled motivation orientation in the model to explore their potential moderating roles.

Method

Participants. The sample comprised of 253 male university students enrolled in first year psychology courses. Participant's age ranged between 17 and 29 years old ($M = 19.59$, $SD = 2.25$) and the majority were White (55.3%), followed by Asian (13.0%), Middle Eastern (12.6%), African Canadian (7.5%), Native Indian (2.8%), and other (8.8%, e.g., mixed). Participants identified as single (67.6%), in a relationship (25.7%), dating (5.5%), married (.4%), or other (.8%). Participants also reported being heterosexual (90.5%), gay (5.5%), bisexual (3.2%), or other (.8%). Self-reported weight (in pounds) and height (in feet and inches) were used to calculate their body mass index (BMI). Participants' BMI ($M = 23.74$, $SD = 3.79$) averaged around normal weight according to the Health Canada's classification system (2003).

Experimental stimuli and procedure. The sample was recruited through an Integrated System of Participation in Research (ISPR) at the University of Ottawa and received partial course credit in exchange for their participation. The study was available online for participants to complete on their own time. Instructions to use a computer rather than a smartphone or tablet was advised. Men were recruited under the pretext that the study was on "YouTube and Advertising" and aimed to understand male perceptions of ads. Participants first completed assessments of their autonomous and controlled motivation orientation and demographics. Participants were then randomly assigned to view one of the two videos from the pre-study (a feature in PsychData). Following exposure, a word-stem completion task was used to assess appearance schema activation and finally, state self-objectification was assessed.

Measures.

Autonomous and controlled motivation orientation. Participants' autonomous and controlled motivation were assessed using the 28-item Global Motivation Scale (GMS; Guay,

Mageau, & Vallerand, 2003). The GMS measures global motivation orientations and is comprised of five subscales that correspond to the motivational constructs conceptualized by self-determination theory (Deci & Ryan, 1985; 2002). Participants rated the extent to which each of the items corresponded to the reasons why they do things in general. Responses were scored on a 7-point Likert scale from 1 (*does not correspond at all*) to 7 (*corresponds completely*). Sample items include “for the enjoyable feelings I experience” (intrinsic motivation), “because I choose them as a means to attain my objectives” (identified regulation), “because otherwise I would feel guilty for not doing them” (introjected regulation), “because I want to be viewed more positively by certain people” (external regulation), and “although I do not see the benefit in what I am doing” (amotivation). To compute the autonomous motivation index, scores were averaged across the intrinsic and identified regulation items whereas, the controlled motivation index was computed by averaging scores across the external and introjected regulation items (Chemolli & Gagne, 2014; Deci & Ryan, 2008). The internal consistency was acceptable with a Cronbach’s alpha of .91 and .84, respectively.

Appearance schema activation. A modified 22-item word-stem completion task (Hargreaves & Tiggemann, 2002; Tiggemann, Hargreaves, Polivy, & McFarlane, 2004) was used to assess the salience of appearance-related information after exposure to the video. The rationale was that men whose appearance schemata have been activated will produce more appearance-related words compared to those who did not experience an activated appearance schema. Participants were presented with three-letter word-stems that could be completed to represent an appearance related word or non-appearance related word. For example, the stem “CAL____” could be completed as ‘calorie’ or ‘calculate’. Respondents’ scores could range from 0 to 22, with higher numbers indicating more appearance schema activation (i.e., an

indication of information processing bias). Two trained and independent judges coded all of the participant generated words. The inter-rater reliability was acceptable and Cohen's kappa ranged between .82 and .99.

State self-objectification. To evaluate whether the video produced a state of self-objectification, participants were asked to complete a Twenty Statements Test (TST; Fredrickson et al., 1998; Kuhn & McPartland, 1954) comprised of twenty blank sentences each beginning with the stem "I am ____". The instructions were to "complete each stem with words that describe yourself and/or your current state". The same two independent coders classified each statement into one of six categories: (a) body shape and size (e.g., "I am skinny", "I am not in shape") (b) other physical appearance (e.g., "I am blond", "I am average-looking") (c) body functioning (e.g., "I am strong") (d) traits or abilities (e.g., "I am intelligent") (e) states or emotions (e.g., "I am tired") and (f) un-codable. Although more stringent scales have been designed to measure self-objectification among women, the language is not suitable to describe the feelings that men might experience in a state of self-objectification. Hence, the open-ended approach provided a suitable method for measuring self-objectification. The inter-rater reliability was acceptable and Cohen's kappa ranged between .94 and .99 across all items.

Demographic information was recorded including age, ethnicity, sexual orientation, relationship status, weight and height. BMI was calculated using the reported weight and height.

Results

Preliminary analyses. Preliminary analyses were performed using IBM SPSS 23 including data screening and testing assumptions. A missing values analysis (MVA) identified 18 participants with rows of missing data following the video. Given that the study was conducted online, possible internet connection issues may have caused the large quantities of missing data.

We therefore removed the cases and re-ran the MVA for the remaining 255 participants. Less than 5% of data was missing and Little MCAR's test was nonsignificant thereby indicating that data was missing completely at random. Expectation maximization methods were used to impute missing values. Two participants were deleted because they were outliers on age (i.e., over 40 years old) and did not fit well with the rest of the sample. Linearity and normality were sufficiently met. Following the F-Max rule, we found that the variance across groups was roughly equal and thus, the assumption of homogeneity of variance were also met. For subsequent moderated mediation analyses, autonomous and controlled motivation were mean centered to reduce the prospect of multicollinearity.

Group comparisons. Table 1 provides descriptive statistics and the means and standard deviations for the muscular ideal video and neutral video on all outcome variables.

Demographic characteristics. Participants were relatively equivalent on age, $t(251) = -0.26, p = .794$, BMI, $t(249) = -0.47, p = .640$, autonomous motivation, $t(251) = -0.19, p = .844$ and controlled motivation, $t(251) = 1.19, p = .235$, across video conditions. Descriptive statistics across video conditions are displayed in Table 1.

Effects of video on state self-objectification. An independent samples t -test confirmed a significant difference between the muscular ideal video group ($M = 2.98, SD = 2.33$) and neutral video group ($M = 2.09, SD = 1.79$) on state self-objectification $t(251) = -3.39, p = .001, d = 0.44$. According to the means, exposure to the muscular ideal video predicted significantly more state self-objectification compared to men in the neutral group.

Effect of video on cognitive functioning. An independent samples t -test also confirmed a significant difference between the muscular ideal video group ($M = 8.93, SD = 3.56$) and neutral video group ($M = 6.57, SD = 2.77$) on appearance schema activation $t(251) = -5.86, p < .001, d =$

0.74. As seen from the means and as hypothesized, exposure to the male muscular ideal video predicted significantly more appearance-related words on the word-stem completion task thus indicating more appearance schema activation compared to men in the neutral video condition.

Mediation and moderated mediation analyses. The subsequent mediation and moderated mediation analyses were conducted according to the bootstrap method outlined by Hayes (2012, 2013). Bootstrapping is recommended over other methods such as Baron and Kenny's causal step approach because its benefits include higher power and lower Type 1 error rates. Additionally, the bootstrapping method requires fewer assumptions about the shape of the sampling distribution of the indirect effect. Hence, the SPSS macro PROCESS was used to generate regression coefficients and bootstrap confidence intervals with 5000 iterations.

Simple mediation. A simple mediation model was employed to explore self-objectification as a mediator on the effects of video exposure on word-stem completion (i.e., an indication of appearance schema activation). Figure 1 presents the model's coefficients. Results indicated that video had a significant direct effect on word-stem completion performance, $c' = 2.07$, $SE = .39$, $p < .001$ and on state self-objectification, $a = .89$, $SE = .26$, $p < .001$. State self-objectification revealed a significant direct effect on word-stem completion, $b = .33$, $SE = .10$, $p = .001$. The total effect was also significant, $c = 2.37$, $SE = .41$, $p < .001$. A significant indirect effect of video on word-stem task through state-self-objectification emerged with a point estimate of .29 and 95% bias corrected and accelerated (BCa) bootstrap confidence interval (CI) [.109, .577]. Overall, the video explained a significant portion of the variance, approximately 12%, in schema activation both directly and indirectly through state self-objectification, $R^2 = .12$, $F(1, 251) = 34.91$, $p < .001$. The muscular ideal video therefore increased men's state self-objectification, which in turn, influenced more appearance schema

activation as indicated by poorer performance on the word-stem completion task. The effect size, $\kappa^2 = .045$ with CI [.017, .085] approaches a medium effect.

Moderated mediation. Two moderated mediation analyses extended the former mediation model. A moderated mediation model was run for each moderator separately in order to retain the index of moderated mediation for inferences about our main hypotheses.

The first moderated mediation tested the effect of video on word-stem completion indirectly through self-objectification (mediator), and simultaneously, tested whether the indirect effect was contingent on degree of autonomous motivation orientation (moderator) while controlling for controlled motivation. The results are presented in Figure 2. Consistent with the mediation analysis, the direct and indirect effects associated with the components of the mediation (i.e., the relationship between video and word-stem completion through state self-objectification) remained significant even as a function of autonomous motivation, $a_1 = .94$, $SE = .26$, $p < .001$; $b_1 = .25$, $SE = .10$, $p = .01$; $c_1' = 2.18$, $SE = .39$, $p < .001$. In addition, results indicated that autonomous motivation was not a significant predictor on state self-objectification, $a_2 = .25$, $SE = .19$, $p = .194$ nor was it a significant predictor of performance on the word-stem task, $c_2' = .39$, $SE = .31$, $p = .198$. Though, the interaction between video and autonomous motivation significantly predicted state self-objectification, $a_3 = -.79$, $SE = .31$, $p = .01$ and word-stem completion, $c_3' = -2.15$, $SE = .48$, $p < .001$. Therefore, a significant moderation was found for both men's self-objectification and performance on the word-stem task (while accounting for controlled motivation). Most valuable is the index of moderated mediation (b_1a_3) because in order to test our main hypothesis, this is a formal test of whether our moderated mediation was supported. Results indicated that the index of moderated mediation (see bold paths in Figure 2) was significant, index = $-.20$, $SE = .11$, CI $[-.522, -.044]$. Hence, the indirect effect of video on

word-stem completion through state self-objectification was a function of autonomous motivation (for a visual representation of the relationship refer to Figure 3). The more autonomous motivation orientation reported, the less the muscular ideal video influenced word-stem completion through self-objectification. In other words, men who were high on autonomous motivation were protected from the effects of the muscular ideal video and thus demonstrated lower levels of state self-objectification, which in turn, predicted less appearance schema activation.

The second moderated mediation tested the effect of video on word-stem completion indirectly through self-objectification (mediator), and simultaneously, tested whether the indirect effect was contingent on the degree of controlled motivation orientation (moderator) while controlling for autonomous motivation. The direct and indirect effects associated with the components of the simple mediation (i.e., between video and word-stem completion through state self-objectification) was significant even as a function of controlled motivation, $a_1 = .93$, $SE = .27$, $p < .001$; $b_1 = .32$, $SE = .10$, $p < .001$; $c_1' = 2.10$, $SE = .34$, $p < .001$. The results revealed that controlled motivation was not a significant predictor on state self-objectification, $a_2 = .24$, $SE = .14$, $p = .083$ nor was it a significant predictor on performance on the word-stem task, $c_2' = .20$, $SE = .27$, $p = .454$. The interaction between video and controlled motivation was not a significant predictor on state self-objectification, $a_3 = -.12$, $SE = .23$, $p = .602$ nor on word-stem completion, $c_3' = -.40$, $SE = .39$, $p = .308$. The index of moderated mediation was also nonsignificant, index = $-.04$, $SE = .08$, CI $[-.216, .103]$. Overall, controlled motivation did not play a moderating role on state self-objectification or on word-stem completion performance.

Consistent with previous studies, the muscular ideal video predicted increased appearance schema activation and increased self-objectification in men. In line with our second

hypothesis, we found that following the muscular ideal video men reported higher levels of state self-objectification which mediated the effects on appearance schema activation. Supporting our third hypothesis, autonomous motivation moderated the effects of the muscular ideal video. Men who were exposed to the muscular ideal and who reported more autonomous motivation experienced less self-objectification and less appearance schema activation compared to men who were low on autonomous motivation. Controlled motivation did not have a moderating effect on men.

Study 2

Study 2 aimed to build on Study 1 to assess the effects of the muscular ideal video on men's state self-objectification and cognitive performance using a visual-spatial task. We also included autonomous and controlled motivation orientation to test their moderating roles.

Method

Participants. The sample was comprised of 148 male university students enrolled in first year psychology courses who received partial course credit in exchange for their participation. Participant ages ranged from 16 to 28 years ($M = 19.59$, $SD = 2.09$) and the majority were White (54.7%), followed by Middle Eastern (14.9%), African Canadian (10.1%), Asian (8.8%), Native Indian (4.7%), and other (6.8%, e.g., mixed). Participants identified as single (64.9%), in a relationship (28.4%), dating (5.4%), married (0.7%), or other (0.7%). Participants also reported being heterosexual (93.9%), gay (4.7%), bisexual (.7%), or other (.7%). Self-reported weight and height were used to calculate BMI. Participants' BMI ($M = 23.89$, $SD = 3.39$) averaged around normal weight.

Experimental stimuli and procedure. Students were recruited from the ISPR to ensure that participants from Study 1 were not aware of the second study nor able to participate. The

procedure was similar to Study 1. Using a between-subjects experimental design, men were brought into a lab setting to complete assessments of their autonomous and controlled motivation orientation, view a randomly assigned video (i.e., from the pre-study), complete a Soma puzzle activity, and complete a final questionnaire assessing state self-objectification.

Measures.

Autonomous and controlled motivation orientation. The two motivation constructs were assessed in the same manner as Study 1. The internal consistency was acceptable for both autonomous and controlled motivation orientation with a Cronbach's alpha of .87 and .83, respectively.

Cognitive performance on a visual-spatial orientation task. A Soma puzzle task was used to measure performance accuracy and perceived difficulty on a challenging yet engaging visual-spatial task (Deci, 1971; Enzle & Ross, 1978). Participants received a score of 1 for accurate completion per puzzle and 0 for each incorrect puzzle. We also included a measure of perceived difficulty because we expected that some men would find the puzzles more challenging than others especially given the time constraints irrespective of accurately solving the puzzles. Participants rated each puzzle's difficulty on a scale ranging from 1 (*not at all difficult*) to 7 (*extremely difficult*). Participants were asked to replicate five Soma puzzle configurations with the blocks provided. The puzzles ranged from extremely easy (Puzzle 1) to extremely difficult (Puzzle 5). Participants were encouraged to attempt each puzzle during a 20-minute timeframe without sacrificing accuracy. Given that the disruption of cognitive functioning is generally observed during difficult tasks than for easy tasks (Deci & Ryan, 2002), we expected the cognitive effects (i.e., poor accuracy and increased perceived difficulty) to emerge on the difficult levels (i.e., Puzzle 4 and Puzzle 5).

State self-objectification. Self-objectification was assessed in the same manner as Study 1. The inter-rater reliability for coding ranged between .89 and .99.

Demographic information included age, ethnicity, sexual orientation, relationship status, weight and height. BMI was calculated using the reported weight and height.

Results

Preliminary analyses. Data screening and assumption tests were conducted prior to the analyses. Following the MVA, we decided to omit Puzzle 5 because well over 10% of data were missing on this item. Participants often ran out of time during their attempt with the last puzzle. Once omitted, the MVA revealed that less than 5% of data was missing. Little MCAR's test was nonsignificant thus indicating that data was missing completely at random. Expectation maximization methods were used to impute missing values. Furthermore, given the large sample size, linearity and normality were met. Values of kurtosis and skewness were all within acceptable range (-2.01 to .67 and -1.29 to .06, respectively). Due to the number of dependent variables, we applied the less conservative F-Max rule and Box's M test to show that homogeneity of variance and covariance were met. During subsequent moderation analyses, autonomous and controlled motivation were mean centered to reduce multicollinearity.

Group comparisons. Table 2 displays descriptive statistics as well as means and standard deviations across video conditions on state self-objectification and cognitive performance outcomes.

Demographic characteristics. Participants' age, $t(146) = 0.31, p = .759$, BMI, $t(145) = -0.81, p = .420$, autonomous motivation, $t(146) = -0.89, p = .377$, and controlled motivation, $t(146) = 1.16, p = .249$, did not vary across video exposure groups.

Effects of video on state self-objectification. An independent-samples *t*-test was conducted to compare state self-objectification across video conditions. A significant difference was found between the neutral ($M = 0.93$, $SD = 1.22$) and the muscular ideal ($M = 1.51$, $SD = 1.58$) video conditions, $t(145) = -2.48$, $p = .01$, $d = .41$. The result suggests that men in the muscular ideal group reported significantly higher levels of self-objectification compared to men in the neutral group.

Effects of video on cognitive performance. We applied the Bonferroni correction to deal with familywise error rates. Three independent samples *t*-tests were used to set the stage for our analysis of interest and to show that the hypothesized effects on Puzzle 4 were not spurious. All three independent samples *t*-tests revealed nonsignificant differences between video groups on accuracy for the easy and moderately easy puzzles. Specifically, accuracy on Puzzle 1, $t(146) = 0.38$, $p = .704$, Puzzle 2, $t(146) = 0.39$, $p = .694$, and Puzzle 3, $t(146) = 0.48$, $p = .634$, were similar across video conditions. We hypothesized that differences would emerge on the difficult puzzles (Puzzle 4). Results revealed that the muscular ideal video group ($M = .19$, $SD = .40$) performed significantly worse compared to the neutral video group ($M = .37$, $SD = .48$), $t(146) = 2.38$, $p = .019$, $d = .41$. Hence, exposure to muscular ideal video predicted less accuracy on Puzzle 4 compared to men in the neutral video condition.

Three preliminary independent samples *t*-tests were also conducted on level of perceived difficulty for the easy and moderately easy Puzzles. Given the multiple tests correction, perceived difficulty was nonsignificant across video groups on Puzzle 1, $t(146) = -0.36$, $p = .719$, Puzzle 2, $t(146) = 0.19$, $p = .847$, and Puzzle 3, $t(146) = 0.13$, $p = .899$. Our hypotheses were specifically for the difficult puzzle (Puzzle 4). A significant difference between the muscular ideal video group ($M = 4.95$, $SD = 1.94$) and neutral video group ($M = 4.26$, $SD = 1.72$) emerged

on perceived difficulty, $t(146) = -2.31, p = .022, d = .37$. Exposure to the muscular ideal video therefore predicted more perceived difficulty on Puzzle 4 compared to the neutral group. Since the results for accuracy and perceived difficulty on Puzzle 4 revealed significant group difference on men's cognitive performance, we continued to explore the moderating effect of motivation orientation.

Multiple moderation analyses. Two multiple moderation analyses were conducted using the SPSS macro PROCESS (Hayes, 2012, 2013). In the models tested, we included both autonomous and controlled motivation as moderators to control for each other. We also controlled for BMI and found that the results were the same when BMI was excluded. We therefore provide the results without BMI.

The first multiple moderation tested the interaction between video condition and autonomous motivation (moderator 1) and controlled motivation (moderator 2) on Puzzle 4 accuracy. Coefficients are reported in Figure 4. The overall model was significant, Cox-Snell $R^2 = .14, p < .001$, on Puzzle 4 accuracy. Results indicated that the main effect of video on Puzzle 4 accuracy (when holding autonomous and controlled motivation constant) was significant, $b_1 = 1.29, p = .007$, indicating that the muscular ideal video indeed negatively influenced the ability to accurately solve the puzzle. The effect of autonomous motivation orientation on Puzzle 4 accuracy was nonsignificant, $b_2 = -.34, p = .336$. Likewise, the effect of controlled motivation on Puzzle 4 accuracy was nonsignificant, $b_3 = -.07, p = .740$. The interaction between autonomous motivation orientation and video on Puzzle 4 accuracy (when holding controlled motivation constant) was significant, $b_4 = 2.29, p = .001$. Therefore, men in the muscular ideal video condition who reported higher levels of autonomous motivation were more likely to accurately solve Soma Puzzle 4 compared to men who reported lower levels of autonomous motivation.

When comparing the two video conditions, the muscular ideal video group, on average, reported less accuracy on Puzzle 4 ($M = .19$, $SD = .40$) compared to the neutral video group ($M = .37$, $SD = .48$). The interaction between controlled motivation orientation and video (when holding autonomous motivation constant) on accurately solving the puzzle was nonsignificant, $b_5 = .32$, $p = .416$. Due to the fact that the outcome was a dichotomous variable, PROCESS cannot generate effect sizes.

A second multiple moderation was conducted to test the interaction between video condition and autonomous motivation (moderator 1) and controlled motivation (moderator 2) on Puzzle 4 perceived difficulty. The coefficients are reported in Figure 5. The overall model was significant, $R^2 = .43$, $F(5, 142) = 40.49$, $p < .001$, explaining 43% of the variance in perceived difficulty. Results indicated that the main effect of video on Puzzle 4 perceived difficulty (when holding autonomous and controlled motivation constant) was significant, $b_1 = .92$, $p < .001$. The effect of autonomous motivation on perceived difficulty was also significant, $b_2 = -1.42$, $p < .001$. In general, men who scored high on autonomous motivation perceived less difficulty on Puzzle 4 compared to men who scored low on autonomous motivation orientation. The effect of controlled motivation on perceived difficulty was also significant, $b_3 = .35$, $p = .024$. That is, men who scored high on controlled motivation perceived more difficulty on Puzzle 4 compared to men who scored low on controlled motivation orientation. The interaction between autonomous motivation and video on Puzzle 4 perceived difficulty (when holding controlled motivation constant) was marginally significant, $b_4 = -.53$, $p = .058$. Trends showed that men in the muscular ideal video condition who had higher levels of autonomous motivation perceived the puzzle to be less difficult compared to those with lower levels of autonomous motivation. Men in the control condition demonstrated similar trends because those who reported higher levels of autonomous

motivation also reported less perceived difficulty. When comparing the two video conditions, the muscular ideal video group, on average, reported more perceived difficulty on Puzzle 4 ($M = 4.95$, $SD = 1.94$) compared to the neutral video group ($M = 4.26$, $SD = 1.72$). The interaction between controlled motivation and video on perceived puzzle difficulty was nonsignificant, $b_5 = .23$, $p = .313$. Autonomous motivation uniquely accounted for .96% (R^2 change = .009) of the variance in perceived difficulty, $F(1,142) = 3.63$, $p = .058$, whereas controlled motivation accounted for .45% (R^2 change = .004) of the variance, $F(1,142) = 1.03$, $p = .313$.

Consistent with Study 1, the muscular ideal video had a negative effect on men's self-objectification and cognitive performance on a visual-spatial task. In addition, autonomous motivation orientation moderated the effects of the muscular ideal video. Men who were exposed to the muscular ideal and who reported more autonomous motivation were more likely to accurately solve the difficult puzzle compared to men who reported low levels of autonomous motivation orientation. Although marginally significant, autonomous motivation also played a protective role for men who were exposed to the muscular ideal video on perceived puzzle difficulty. A controlled motivation orientation did not play a moderating role among men.

Study 3

Study 3 extends from Studies 1 and 2 to assess the effects of the muscular ideal video on men's cognitive performance using an information processing proficiency task. We included autonomous and controlled motivation orientation to similarly test their moderating roles.

Method

Participants. The sample comprised of 175 male university students who received partial course credit in exchange for their participation. Participant's ages ranged from 16 to 30 years ($M = 19.82$, $SD = 2.39$) and the majority were White (57.1%), followed by Asian (12%), Middle

Eastern (10.9%), African Canadian (9.2%), Native Indian (3.4%), and other (7.4%, e.g., mixed). Participants identified as single (61.1%), in a relationship (26.3%), dating (12%), or married (.6%). Participants also reported being heterosexual (93.1%), gay (2.9%), bisexual (2.9%), or other (1.1%). Participants' BMI ($M = 23.72$, $SD = 3.52$) averaged around normal weight.

Experimental stimuli and procedure. Participants were recruited from the ISPR to make certain that participants did not partake in the two prior studies. This study was conducted a year after Studies 1 and 2 and the procedure was similar to Studies 1 and 2. Using a between-subject cross-sectional design, men were recruited under the pretext that the study was on “Advertising and Consumerism”. Participants completed assessments of their autonomous and controlled motivation and demographics, then engaged in a practice Stroop test to learn the task and normalize their reaction times, watched a randomly assigned video (i.e., from the pre-study), and completed the Modified Stroop task to assess cognitive performance.

Measures.

Autonomous and controlled motivation orientation. The two motivation constructs were assessed in the same manner as Studies 1 and 2. The internal consistency was acceptable for both autonomous and controlled motivation orientation with a Cronbach's alpha of .93 and .83, respectively.

Cognitive performance on information processing speed. A Modified Stroop task was used to measure performance on cognitive processing speed (Aspen et al., 2011; Labarge, Cash, & Brown, 1998). The Modified Stroop task includes three types of word categories: appearance-related words, neutral words, and the original Stroop color words. A total of 20 appearance-related words were included in the task. Sample words include obese, weight, muscular, bicep, ugly, and abdomen. In addition, 20 emotionally neutral words were included such as cat, week,

bench, walrus, rent, and distant. Finally, the original Stroop color words were divided into congruent (e.g., the word “green” written in green) and incongruent words (e.g., the word “red” written in blue, green, or yellow). All words were presented on a high-resolution ViewSonic 24-inch computer screen. Both the order of the words and colors were randomized by the program. We applied a Latin square counterbalancing scheme to limit confounding effects with finger-action speed and color identity. The four sequences included variations of blue-yellow-green-red. Words were shown in 40-point Verdana bold uppercase font in the center of the screen. There was a total of 120 trials (2 sets of 60 trials) with each stimulus displayed on the screen “infinitely” until the participant responded. A 500-millisecond fixation period was presented between each trial to provide the participant with a pause after each response. Reaction times were obtained through key-press which recorded the time elapsed in milliseconds between stimulus onset and the participant’s response. Stroop task data was analyzed using averaged reaction times for each word category. Average reaction times for each participant were examined based on correct responses only (Aspen et al., 2011). Error rates were not analyzed because they were infrequent and comparable across word categories.

The original Stroop task was given prior to video exposure for practice. Practice trials serve at least two functions. They allow the participants to become familiar with the task and the equipment, and they stabilize reaction times which are quite variable over the first few trials (Gul & Humphreys, 2015). Participants practiced with 20 trials of color words presented in blue, yellow, green, or red font. The instructions for the Modified Stroop task were to identify the color of the font presented on the screen by pressing the corresponding colored key as quickly and as accurately as possible.

Demographic information included age, ethnicity, sexual orientation, relationship status, weight and height.

Results

Preliminary analyses. Preliminary analyses were performed for data screening and testing of assumptions. Initially, we ran the MVA and found that less than 5% of data was missing. Little MCAR's test revealed that data was missing completely at random, hence, expectation maximization methods were used to impute missing values. Basic assumptions of linearity and normality were met given the large sample size. Values of kurtosis and skewness were within acceptable range (-.59 to .40 and -.46 to .35, respectively). We also applied the F-Max rule and Box's M test, which were nonsignificant, to reveal that homogeneity of variance and covariance was met. During the following moderation analyses, autonomous and controlled motivation were mean centered to reduce multicollinearity.

Group comparisons. Table 3 provides descriptive statistics as well as means and standard deviations across video groups on performance on the Modified Stroop task.

Demographic characteristics. Participants were equivalent on age, $t(172) = -0.90, p = .369$, BMI, $t(171) = -0.87, p = .388$, autonomous motivation orientation, $t(173) = -1.91, p = .058$, and controlled motivation, $t(173) = -2.10, p = .038$, after applying the Bonferroni adjustment.

Effects of video on cognitive performance. Respecting the multiple tests correction, three independent samples t -tests were used to determine the effect of video on cognitive performance for each of the Stroop categories. As hypothesized, a significant difference between the muscular ideal video group ($M = 661.86, SD = 127.93$) and neutral video group ($M = 616.89, SD = 106.76$) on appearance-related words emerged, $t(173) = -2.52, p = .013, d = 0.38$. Based on the means, exposure to the muscular ideal video predicted slower reaction times compared to

men in the neutral video condition. In addition, a significant difference was found between the muscular ideal video group ($M = 708.12$, $SD = 130.04$) and neutral video group ($M = 654.28$, $SD = 112.41$) on color words, $t(173) = -2.93$, $p = .004$, $d = 0.45$. Men who were exposed to the muscular ideal video also experienced slower reaction times on color words compared to men in the neutral condition. Lastly, video group differences were not significant on neutral word reaction times, $t(173) = -0.37$, $p = .711$.

Multiple moderation analyses. To further explore the differences between video groups on Stroop task appearance-related words and color words, two multiple moderations were used which included autonomous and controlled motivation as moderators.

The first multiple moderation investigated the interaction between video and autonomous motivation (moderator 1) and controlled motivation (moderator 2) on appearance-related word reaction time. The overall model was significant, $R^2 = .38$, $F(5,169) = 17.64$, $p < .001$, explaining 38% of the variance in appearance word reaction time. Results indicated that the main effect of video on appearance word reaction time (when controlling for autonomous and controlled motivation) was significant, $b_1 = 65.33$, $p < .001$. The effect of autonomous motivation orientation on appearance word reaction time was also significant, $b_2 = -47.44$, $p < .001$. The effect of controlled motivation orientation on reaction time was nonsignificant, $b_3 = -17.29$, $p = .06$. The interaction between autonomous motivation and video on appearance word reaction time (when accounting for controlled motivation) was significant, $b_4 = -57.79$, $t(169) = -3.11$, $p = .002$. For a visual representation please refer to Figure 6. Men in the muscular ideal video condition who scored high on autonomous motivation had faster reaction times on the appearance words compared to men who scored lower on autonomous motivation. Comparing the video condition, the muscular ideal video group, on average, had slower reaction times for

appearance words ($M = 661.86$, $SD = 127.93$) compared to the neutral video group ($M = 616.89$, $SD = 106.76$). Furthermore, the interaction between controlled motivation and video on reaction time was marginally significant, $b_5 = 27.56$, $t(169) = 1.99$, $p = .05$. In general, men in the muscular ideal video condition who scored high on controlled motivation orientation had slower reaction times compared to those in the neutral condition with high controlled motivation. Though, men in the muscular ideal condition generally had slower reaction times regardless if they reported low, moderate or high levels of controlled motivation. Autonomous motivation orientation uniquely accounted for 4% (R^2 change = .04) of the variance in reaction time on appearance-related words, $F(1,169) = 9.70$, $p = .002$, whereas, controlled motivation orientation uniquely accounted for 1.5% (R^2 change = .015) of the variance, $F(1,169) = 3.95$, $p = .049$.

The second multiple moderation tested a similar model except on reaction time for Stroop task color words. The overall model was significant, $R^2 = .31$, $F(5, 169) = 17.26$, $p < .001$ explaining 31% of the variance in color word reaction times. Results indicated that the main effect of video on color word reaction times (when holding autonomous and controlled motivation constant) was significant, $b_1 = 71.01$, $p < .001$. The effect of autonomous motivation on color word reaction times was also significant, $b_2 = -47.12$, $p < .001$. The effect of controlled motivation on reaction time was nonsignificant, $b_3 = -11.30$, $p = .30$. The interaction between autonomous motivation and video on reaction time for color words (when holding controlled motivation constant) was significant, $b_4 = -47.15$, $p = .009$. For a visual representation please refer to Figure 7. Essentially, men who scored high on autonomous motivation had faster reaction times on color words compared to those who scored lower on autonomous motivation. In general, men in the muscular ideal video group had slower reaction times ($M = 708.12$, $SD = 130.04$) compared to men in the neutral video group ($M = 654.28$, $SD = 112.41$). The interaction

effect of controlled motivation and video on reaction times was nonsignificant, $b_5 = 25.50$, $p = .07$. Autonomous motivation uniquely accounted for 2.5% (R^2 change = .025) of the variance in color word reaction times, $F(1,169) = 6.90$, $p = .009$ and controlled motivation accounted for 1.2% (R^2 change = .012) of the variance, $F(1,169) = 3.36$, $p = .068$.

Consistent with previous studies among women, exposure to media body ideals prior to engaging in the Modified Stroop task predicted poorer performance (i.e., slower reaction times) for color and appearance-related words (e.g., Aspen et al., 2011; Labarge, Cash, Brown, 1998; Tiggemann et al., 2004). In addition, autonomous motivation moderated the effects. Thus, men who were exposed to the muscular ideal and had were high on autonomous motivation orientation outperformed men who were low on autonomous motivation. Controlled motivation also moderated the effects on the appearance-related words. Men who were exposed to the muscular ideal and who were high on controlled motivation performed more poorly compared to men who were low on controlled motivation.

General Discussion

The purpose of the current research program was to identify and understand whether self-objectification (i.e., mediator) and motivation orientation (autonomous versus controlled; i.e., moderators) influenced men's cognitive functioning following exposure to advertisements portraying the male muscular ideal. Therefore, we aimed to 1) test an original moderated mediation model to further understand the complexities of men's body image outcomes and 2) assess the moderating role of autonomous and controlled motivation in more detail to understand their potential relationship with cognitive outcomes in the context of body image. To test our models, we explored whether the muscular ideal video, compared to the neutral video, negatively affected men's cognitive functioning using three different cognitive tasks intended to measure

appearance schema activation (Study 1), visual-spatial processing (Study 2), and processing proficiency (Study 3).

In line with previous studies among men (e.g., Griffiths, Murray, & Touyz (2013; Yanover & Thompson, 2008a, 2008b) and previous studies among women (Aspen et al., 2011; Labarge, Cash, Brown, 1998; Tiggemann et al., 2004), we found that the muscular ideal video, compared to the neutral video, affected men's cognitive functioning and performance on the word stem-completion task (measuring appearance schema activation), the Soma puzzle task (measuring visual-spatial processing), and the Modified Stroop task (measuring information processing proficiency). Though research in this domain is sparse, our findings indicate that Western male body ideals have the potential to temporarily alter men's cognitive functioning. Although the extent of the impact of media body ideals on cognitive functioning is unknown, we propose that, through repetitive exposure, the effects might spill onto performance and functioning in everyday life settings like school or sports. Future research should therefore explore the extent of the effects in life domains that require optimal cognitive abilities.

Furthermore, in order to explain the effects on men's cognitive functioning we included objectification theory in the model to test self-objectification as a mediating variable. We hypothesized that if men experienced an increase in self-objectification following the muscular ideal video, they would likely experience poorer cognitive performance. Consistent with former studies among men (e.g., Morry & Staska, 2001) and women (e.g., Quinn et al., 2006), we found that following exposure to the muscular ideal video, state self-objectification increased which, subsequently hindered men's cognitive functioning. More specifically, we found that men who reported higher levels of self-objectification following exposure to the muscular ideal ultimately demonstrated more appearance schema activation thereby demonstrating a disruption in

information processing. Evidently, portrayals of the muscular ideal can have deleterious effects on cognition and the effect is for some men, are at least in part, elicited through the process of self-objectification as similarly found among women (Calogero, Pina, Park, & Rahemtulla, 2010; Gervais, Vescio, & Allen, 2011).

Since objectification theory recognizes that not all individuals experience self-objectification to the same extent, and that not all individuals experience cognitive repercussions following exposure to media body ideals, we integrated a moderation component to our model to account for such individual differences. Thus, coupled with objectification theory, our model also integrated autonomous and controlled motivation constructs from self-determination theory. In line with self-determination theory, we predicted that men high on global autonomous motivation would likely be more protected from the negative effects of the media while men who reported more global controlled motivation would likely be more vulnerable to the effects of media body ideals.

Consistent with previous studies among samples of women (Mask & Blanchard, 2011a; Mask et al., 2014; Pelletier et al., 2004), our three studies found that an autonomous motivation orientation played a protective role among male viewers against the effects of the muscular ideal video on self-objectification and poorer cognitive functioning. In general, men who were exposed to the muscular ideal and who reported high levels of autonomous motivation demonstrated less appearance schema activation, performed better on the difficult Soma puzzle (i.e., more accuracy and less perceived difficulty), and performed better on the Stroop task (i.e., faster reaction times) compared to participants who had low levels of autonomous motivation. Hence, a global autonomous motivation has a beneficial role on body image-related outcomes including cognitive health. Future work on autonomous motivation is warranted in order to

comprehend just how autonomous motivation protects viewers from body ideal media messages. Researchers have yet to understand whether highly autonomous individuals simply divert their attention away from the information offered in adverse messages, whether they pay attention but do not process the information, or whether they process the information but perhaps reject it. Prospective research should focus on investigating the profound nature of autonomous versus controlled motivation in order to further advance knowledge in the field.

On the other hand, and contrary to previous studies (e.g., Mask & Blanchard, 2011a, 2011b), controlled motivation orientation did not have a consistently significant deterring effect on men's cognitive performance. In line with Koestner et al. (2008), controlled motivation had relatively no relation to performance. Although evidence exists which maintains that controlled motivation has a negative effect on indicators of well-being and performance (e.g., Deci & Ryan, 2008; Ryan & Deci, 2000), increasingly more evidence suggests that researchers should prioritize exploring the beneficial role of autonomous motivation because often times controlled motivation is found unrelated to health outcomes (Liu, Wang, Tan, Koh, & Ee, 2009; Van den Broeck, Lens, Witte, Van Coillie, 2012). We therefore suggest that individuals ought to focus their efforts on enhancing their autonomous motivation rather than focus on reducing their controlled motivation to improve cognitive functioning and performance.

Limitations and Future Directions

While the current studies advance research in the area of men's body image and cognitive performance in many ways, there are a number of limitations to consider. First, the three studies did not include a measure of trait self-objectification. Research among female samples demonstrates that trait level self-objectification is more taxing and leads to amplified levels of self-surveillance (Calogero, & Pina, 2011; Gay & Castano, 2010). Currently, research including

trait self-objectification remains absent from the male body image literature. This is likely due to the fact that the measure for trait self-objectification initially developed for women is not yet adapted for men. Second, the samples consisted of young White college men and therefore, the results may not be generalizable to alternative male populations. Mainstream literature on male body image predominantly focuses on White men and therefore widening the research scope to include diverse cultural groups is needed. In addition, self-objectification and the benefits of autonomous motivation should be further explored among younger and older male populations. Third, we employed cognitive measures that are merely for research purposes that may not generalize to the cognitive effects that might occur in real-life settings. It would be beneficial to explore the impact of various body ideals on men's cognitive functioning in relevant areas like school performance. Lastly, one study employed an online survey design while the remaining two studies were conducted in a laboratory setting. Thus, understanding how the muscular ideal affects men in their everyday busy lives, particularly when their full attention may not be absorbed in the media source, has yet to be examined. Future research should aim to explore this line of research in more ecologically valid settings like natural, real-world contexts.

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Table 1
Study 1 Means (SD) for Descriptive Statistics and Main Analyses across Video Conditions

	Video Type	
	Muscular Ideal Condition (<i>N</i> = 133)	Neutral Video Condition (<i>N</i> = 120)
Age	19.62 (2.29)	19.55 (2.22)
BMI	23.85 (3.34)	23.63 (4.24)
Motivation orientation		
Autonomous motivation	5.12 (0.83)	5.10 (0.87)
Controlled motivation	4.03 (1.07)	4.20 (1.16)
Cognitive schema		
Word-stem completion task	8.93 (3.56)	6.57 (2.77)***
Self-objectification		
State self-objectification	2.98 (2.33)	2.09 (1.79)**

** $p < .01$, *** $p < .001$.

Table 2

Study 2 Means (SD) for Descriptive Statistics and Main Analyses across Video Conditions

	Video Type	
	Muscular Ideal Condition (<i>N</i> = 72)	Neutral Video Condition (<i>N</i> = 76)
Age	19.49 (2.11)	19.59 (2.09)
BMI	23.89 (3.39)	23.43 (3.48)
Motivation orientation		
Autonomous motivation	5.41 (0.68)	5.31 (0.74)
Controlled motivation	3.93 (1.08)	4.14 (1.16)
Puzzle accuracy		
Soma Puzzle 1	0.72 (0.45)	0.75 (0.44)
Soma Puzzle 2	0.68 (0.47)	0.71 (0.46)
Soma Puzzle 3	0.50 (0.50)	0.54 (0.50)
Soma Puzzle 4	0.19 (0.40)	0.37 (0.48)*
Perceived puzzle difficulty		
Difficulty Puzzle 1	3.92 (1.78)	3.82 (1.87)
Difficulty Puzzle 2	4.03 (1.70)	4.08 (1.82)
Difficulty Puzzle 3	4.61 (1.67)	4.65 (1.54)
Difficulty Puzzle 4	4.95 (1.94)	4.26 (1.72)*
Self-Objectification		
State self-objectification	1.51 (1.58)	0.93 (1.22)*

* $p < .05$.

Table 3

Study 3 Means (SD) for Descriptive Statistics and Main Analyses across Video Conditions

	Video Type	
	Muscular Ideal Condition (<i>N</i> = 88)	Neutral Video Condition (<i>N</i> = 87)
Age	19.98 (2.79)	19.65 (1.89)
BMI	23.95 (3.66)	23.48 (3.39)
Motivation orientation		
Autonomous motivation	6.41 (0.80)	6.16 (0.93)
Controlled motivation	5.23 (1.01)	4.87 (1.24)*
Cognitive Performance		
Appearance-related words	661.86 (127.93)	616.89 (106.76)*
Color words	708.12 (130.04)	654.28 (112.41)**
Neutral words	654.74 (94.02)	649.43 (94.86)

* $p < .05$, ** $p < .01$.

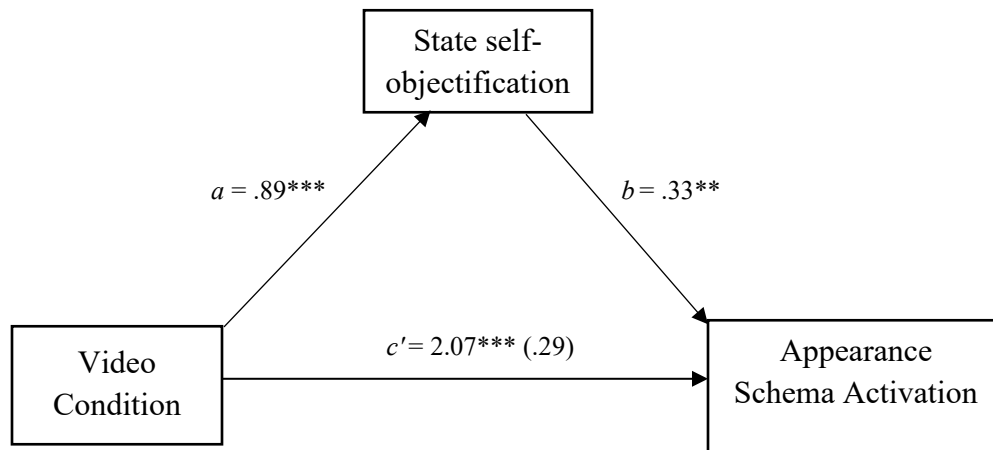


Figure 1. Study 1. Simple mediation model indicating a significant effect of video on appearance schema activation through state self-objectification.

Note. ** $p < .01$, *** $p < .001$.

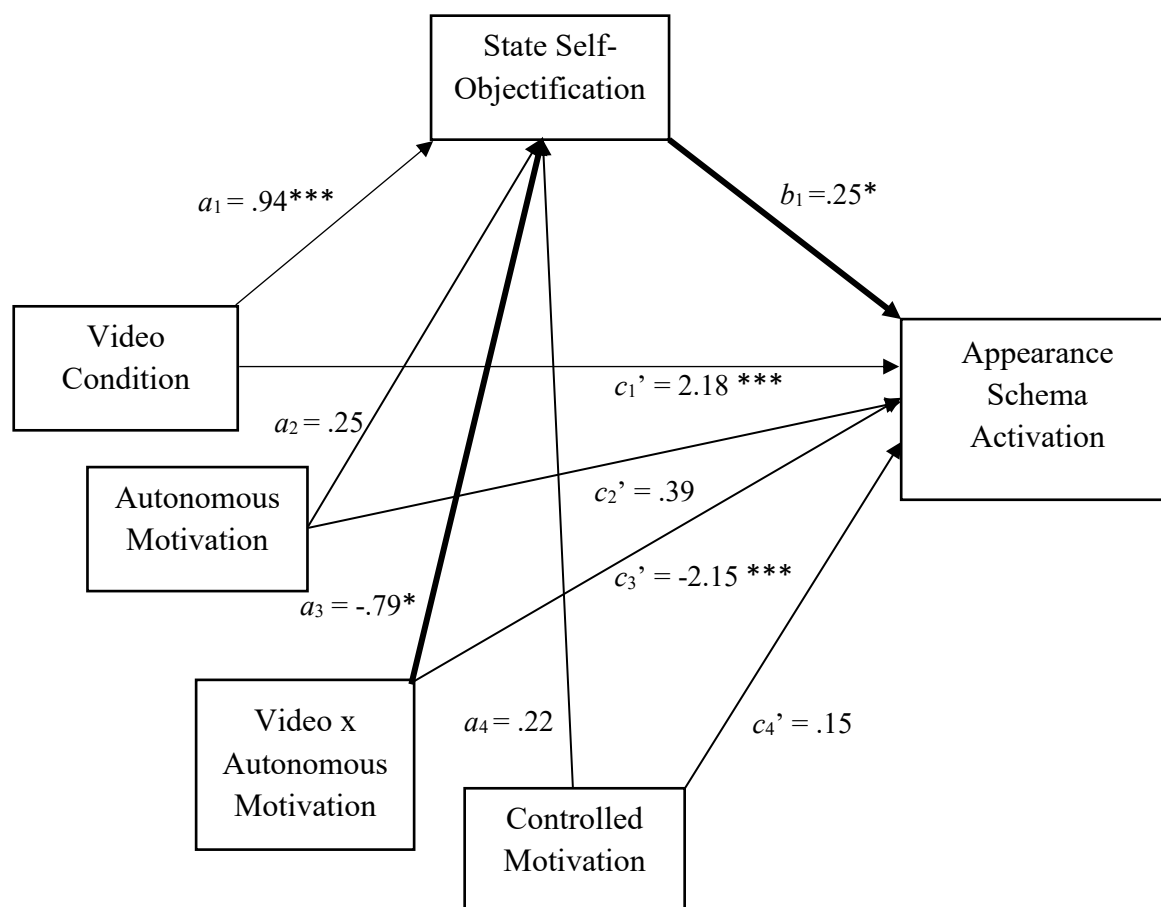


Figure 2. Study 1. A moderated mediation model of the effect of video on appearance schema activation through state self-objectification and as a function of autonomous motivation orientation while controlling for controlled motivation orientation. The thick path coefficients (b_1a_3) are used to compute the index of moderated mediation.

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

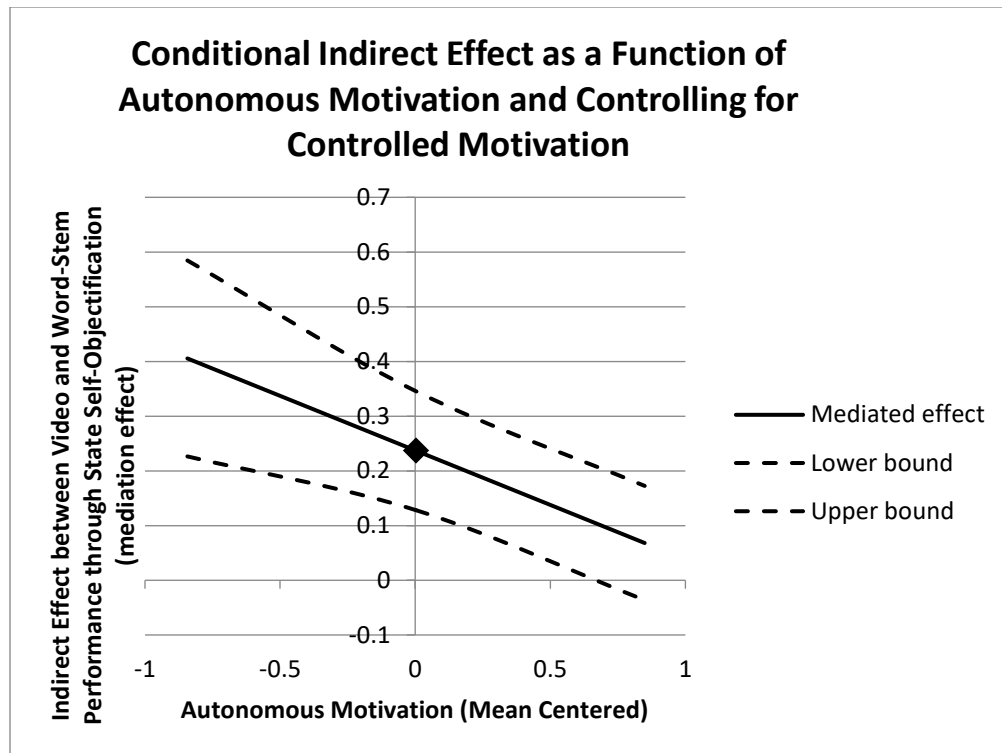


Figure 3. Study 1. A visual representation of the function of autonomous motivation on the indirect effect of video on appearance schema activation through state-self objectification.

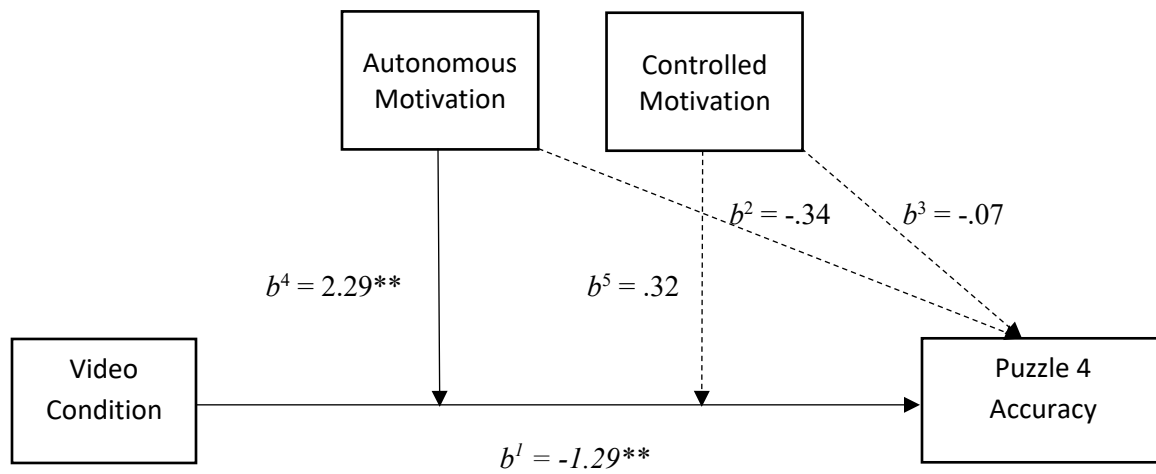


Figure 4. Study 2. Multiple moderation analysis on cognitive performance for Puzzle 4 accuracy ($N = 148$).

Note. Dashed lines are nonsignificant.

* $p < .05$, ** $p < .01$.

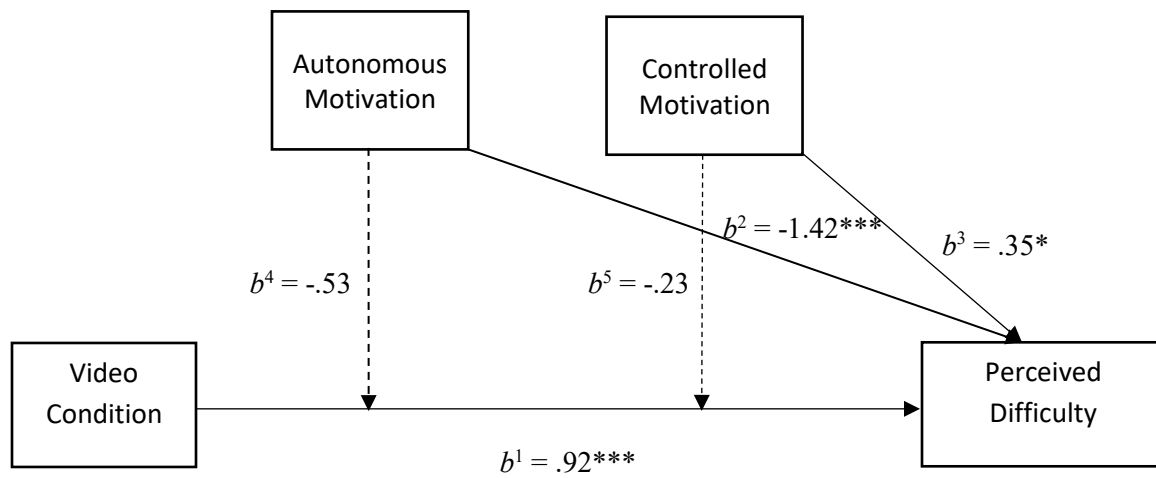


Figure 5. Study 2. Multiple moderation analysis on cognitive performance for Puzzle 4 perceived difficulty ($N = 148$).

Note. Dashed lines are nonsignificant.

* $p < .05$, ** $p < .01$, *** $p < .001$.

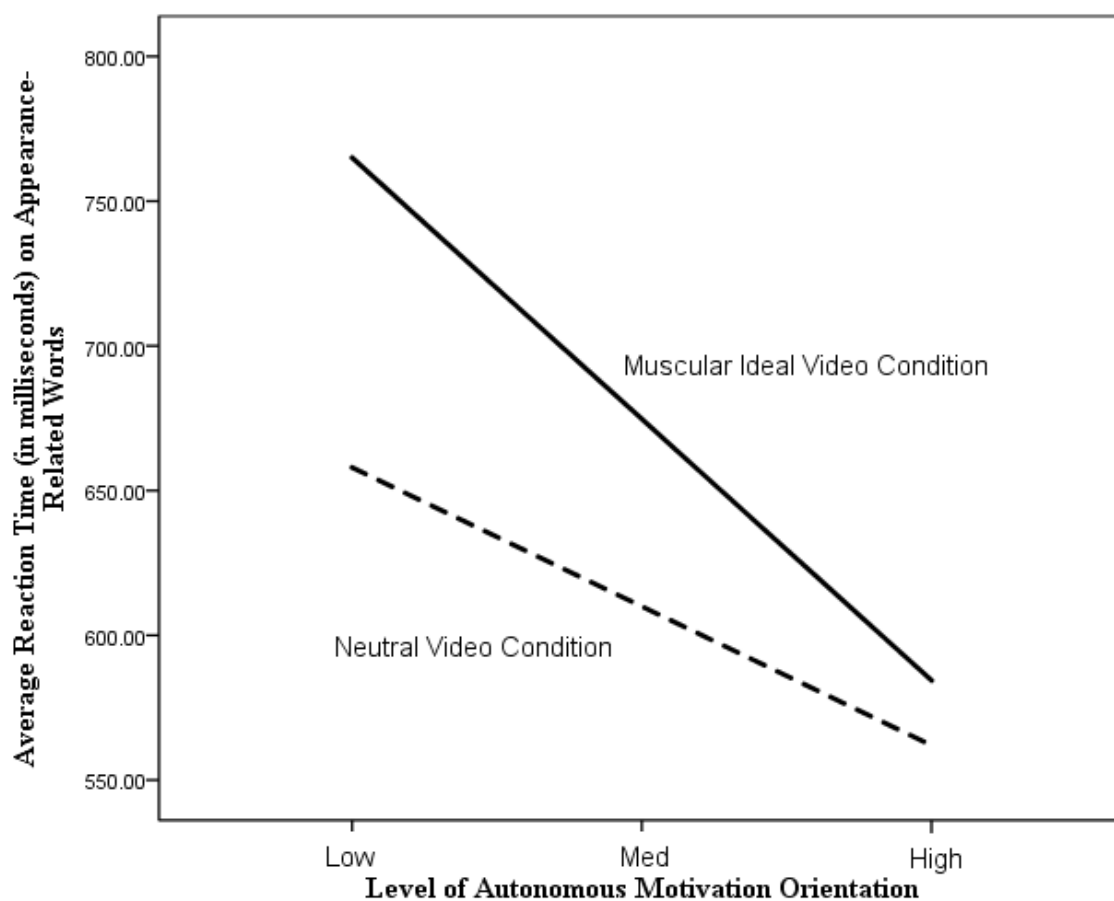


Figure 6. Study 3. The interaction between video condition and autonomous motivation orientation on Stroop task reaction times for the appearance-related words category ($N = 175$).

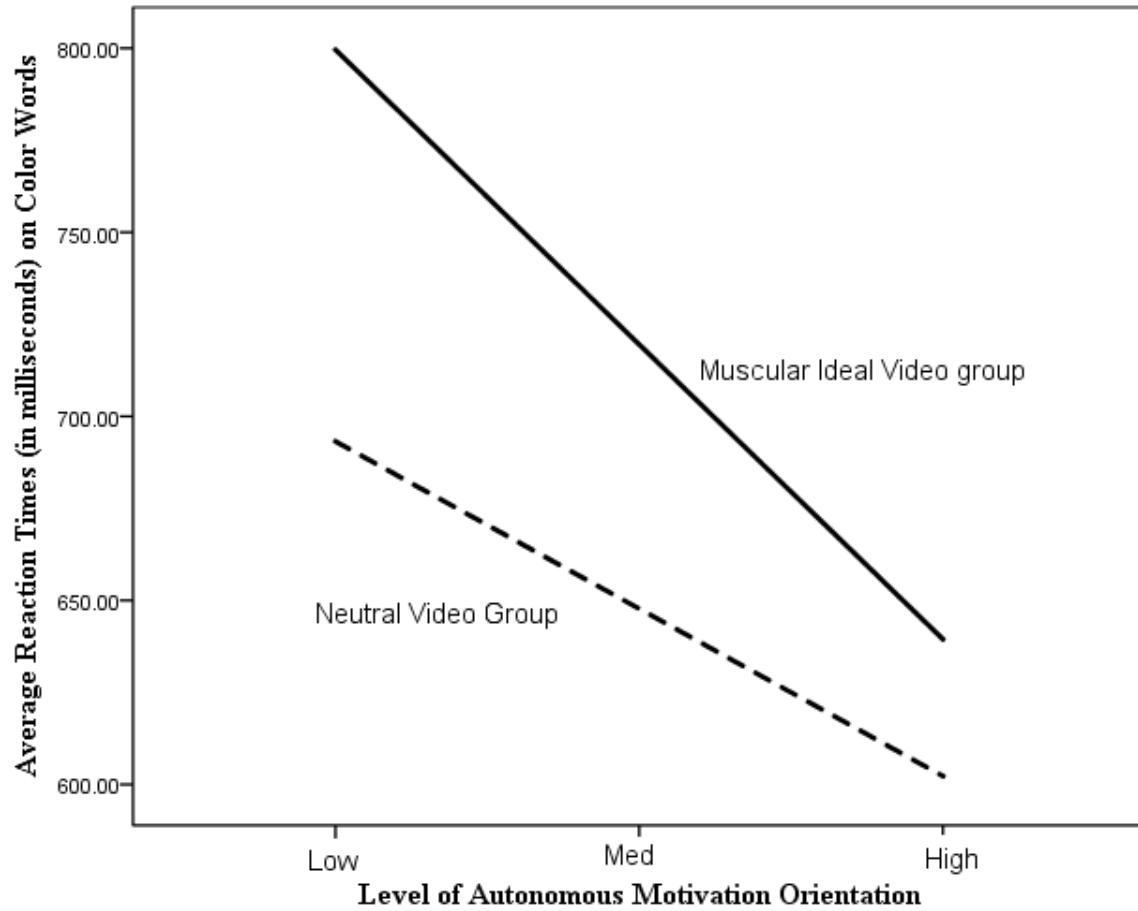


Figure 7. Study 3. The interaction between video condition and autonomous motivation orientation on Stroop task reaction times for the color words category ($N = 175$).

Supplemental Materials

Table 1

Pearson Correlations and Partial Correlations Matrix among Study 1 Variables of Interest

Control Variable	1	2	3	4	5
none					
1. Video		.35***	.21**	.01	-.08
2. Word-stem completion			.27***	-.15*	-.06
3. Self-objectification				-.02	.06
4. Autonomous motivation					.33***
5. Controlled motivation					
Controlled motivation					
1. Video		.34***	.22**	.04	
2. Word-stem completion			.27***	-.14*	
3. Self-objectification				-.04	
4. Autonomous motivation					
Autonomous motivation					
1. Video		.35***	.21**	-.08	
2. Word-stem completion			.27***	-.00	
3. Self-objectification				.07	
4. Controlled motivation					

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 2

Study 1 Unstandardized Regression Coefficients with Confidence Intervals (Standard Errors in Parentheses) for the Moderated Mediation Estimating State Self-Objectification and Appearance Schema Activation while Controlling for Controlled Motivation Orientation. Autonomous Motivation is Mean Centered

			State Self-Objectification (M)			Appearance Schema Activation (Y)		
			Coefficient	BCa 95% CI		Coefficient	BCa 95% CI	
				LL	UL		LL	UL
Constant	i_M		1.15* (.50)	1.72	2.47	i_Y	5.39*** (.88)	3.66 7.13
Video (X)	a_1		.94*** (.26)	0.42	1.45	c_1'	2.19*** (.39)	1.42 2.95
State self-objectification (M)						b_1	.25** (.10)	0.06 0.45
Autonomous motivation (W)	a_2		.25 (.19)	-0.13	0.62	c_2'	.39 (.31)	-0.21 0.99
(X) x (W)	a_3		-.79** (.31)	-1.39	-0.18	c_3'	-2.42*** (.48)	-3.09 -1.20
Controlled motivation (C)	a_4		.22 (.11)	0.00	0.45	c_4'	.15 (.19)	-0.23 0.53
			$R^2 = .08$			$R^2 = .25$		
			$F(4, 248) = 5.25, p < .001$			$F(5, 247) = 13.05, p < .001$		

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

BCa = Bias Corrected and Accelerated; CI = Confidence Interval; LL = Lower Limit, UL = Upper Limit. Based on 5000 bootstrap samples.

Table 3

Study 1 Unstandardized Regression Coefficients with Confidence Intervals (Standard Errors in Parentheses) for the Moderated Mediation Estimating State Self-Objectification and Appearance Schema Activation while Controlling for Autonomous Motivation Orientation. Controlled Motivation is Mean Centered

			State Self-Objectification (M)			Appearance Schema Activation (Y)			
			Coefficient	BCa 95% CI		Coefficient	BCa 95% CI		
				LL	UL		LL	UL	
Constant	i_M		2.65** (.84)	0.99	4.60	i_Y	8.80* (1.45)	5.94	11.65
Video (X)	a_1		.93*** (.27)	0.40	1.45	c_1'	2.10*** (.34)	1.31	2.88
State self-objectification (M)						b_1	.32** (.10)	0.12	0.52
Controlled motivation (W)	a_2		.24 (.14)	-0.03	0.50	c_2'	.20 (.27)	-0.32	0.72
(X) x (W)	a_3		-.12 (.23)	-0.58	0.34	c_3'	-.40 (.39)	-1.16	0.37
Autonomous motivation (C)	a_4		-.11 (.16)	-0.43	0.21	c_4'	-.57 (.28)	-1.12	-0.03
			$R^2 = .05$			$R^2 = .19$			
			$F(4, 248) = 3.68, p = .006$			$F(5, 247) = 9.01, p < .001$			

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

BCa = Bias Corrected and Accelerated; CI = Confidence Interval; LL = Lower Limit, UL = Upper Limit. Based on 5000 bootstrap samples.

Table 4

Pearson Correlations and Partial Correlations Matrix among Study 2 Variables of Interest

Control Variable		1	2	3	4	5	6
none	1. Video		.20*	-.19*	.19*	.07	-.10
	2. Self-objectification			-.02	-.01	.11	-.01
	3. Puzzle 4 accuracy				-.04	-.12	.03
	4. Puzzle 4 difficulty					-.58***	.00
	5. Autonomous motivation						.21**
	6. Controlled motivation						
Controlled motivation	1. Video		.20*	-.21*	.18*	.11	
	2. Self-objectification			-.02	-.01	.12	
	3. Puzzle 4 accuracy				-.06	-.11	
	4. Puzzle 4 difficulty					-.58***	
	5. Autonomous motivation						
Autonomous motivation	1. Video		.19*	-.20*	.28**	-.14	
	2. Self-objectification			-.00	.07	-.04	
	3. Puzzle 4 accuracy				-.14	.03	
	4. Puzzle 4 difficulty					.15	
	5. Controlled motivation						

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 5

Study 2 Multiple Moderation Results for the Effect of Video on Performance Outcomes by Autonomous and Controlled Motivation Orientation

		Soma Puzzle Accuracy			Perceived Difficulty		
		Coefficient (SE)	BCa 95% CI		Coefficient (SE)	BCa 95% CI	
			LL	UL		LL	UL
Intercept	i_1	.54* (.24)	0.07	1.02	4.15*** (.16)	3.83	4.48
Video (X)	b_1	1.29** (.49)	0.34	2.25	.92*** (.23)	0.46	1.38
Auto (M)	b_2	-.34 (.35)	-1.02	0.35	-1.42*** (.16)	-1.73	-1.11
Control (W)	b_3	-.07 (.22)	-0.50	0.35	.35* (.15)	0.05	0.66
Video x Auto (XM)	b_4	2.29*** (.70)	0.93	3.66	-.53 (.28)	-1.09	0.02
Video x Control (XW)	b_5	.32 (.39)	-0.45	1.09	-.23 (.23)	-0.68	0.22
Cox-Snell $R^2 = .14, p < .001$					$R^2 = .43$ $F(5, 142) = 40.49, p < .001$		

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

BCa = Bias Corrected and Accelerated; CI = Confidence Interval; LL = Lower Limit, UL = Upper Limit. Based on 5000 bootstrap samples.

Table 6

Pearson Correlations and Partial Correlations Matrix among Study 3 Variables of Interest

Control Variable		1	2	3	4	5	6
none	1. Video		.19*	.03	.22**	.14	.16*
	2. Appearance words (RT)			.63***	.81***	-.52***	-.14
	3. Neutral words (RT)				.64***	-.15	-.04
	4. Color words (RT)					-.45***	-.08
	5. Autonomous motivation						.27***
	6. Controlled motivation						
Controlled motivation	1. Video		.22**	.04	.23**	.11	
	2. Appearance words (RT)			.64***	.81***	-.50***	
	3. Neutral words (RT)				.64***	-.14	
	4. Color words (RT)					-.44***	
	5. Autonomous motivation						
Autonomous motivation	1. Video		.31***	.05	.32***	.13	
	2. Appearance words (RT)			.66***	.76***	-.00	
	3. Neutral words (RT)				.65***	-.00	
	4. Color words (RT)					.05	
	5. Controlled motivation						

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 7

Study 3 Multiple Moderation Results of the Effect of Video on Stroop Task Word Category Reaction Times by Autonomous and Controlled Motivation

		Appearance Word Reaction Time			Colour Word Reaction Time			Neutral Word Reaction Time		
		Coefficient (SE)	BCa 95% CI		Coefficient (SE)	BCa 95% CI		Coefficient (SE)	BCa 95% CI	
			LL	UL		LL	UL		LL	UL
Intercept	i_1	607.79*** (10.06)	587.92	627.66	646.30*** (11.54)	623.53	669.07	646.80 (10.90)	625.27	668.33
Video (X)	b_1	65.33*** (15.27)	35.18	95.47	71.01*** (16.49)	38.46	103.57	9.18 (15.30)	-21.02	39.38
Autonomous (M)	b_2	-47.44*** (13.16)	-73.42	-21.46	-47.12*** (13.11)	-72.99	-21.24	-2.13 (12.43)	-26.66	22.40
Controlled (W)	b_3	-17.29 (8.96)	-34.98	0.41	-11.30 (10.86)	-32.74	10.13	-13.09 (8.35)	-29.57	3.39
Video x Autonomous (XM)	b_4	-57.79** (18.55)	-94.4	-21.16	-47.15** (17.95)	-82.59	-11.72	-28.38 (16.36)	-60.68	3.93
Video x Controlled (XW)	b_5	27.56* (13.87)	0.18	54.95	25.50 (13.91)	-1.95	52.96	27.42 (13.89)	-0.00	54.84
		$R^2 = .38$ $F(5, 169) = 17.64, p < .001$			$R^2 = .31$ $F(5, 169) = 17.26, p < .001$			$R^2 = .06$ $F(5, 169) = 3.13, p = .010$		

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

BCa = Bias Corrected and Accelerated; CI = Confidence Interval; LL = Lower Limit, UL = Upper Limit. Based on 5000 bootstrap samples.

Running head: EFFECT OF FEMALE THIN IDEAL ON MEN'S BODY IMAGE

The Effects of Female “Thin Ideal” Media on Men’s Appearance Schema, Cognitive
Performance, and Self-Evaluations: A Self-Determination Theory Approach

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Abstract

Research has primarily focused on the consequences of the female thin ideal on women and has largely ignored the effects on men. Two studies were designed to investigate the effects of a female thin ideal video on cognitive (Study 1: appearance schema, Study 2: visual-spatial processing) and self-evaluative measures in male viewers. Results revealed that the female thin ideal predicted men's increased appearance schema activation and poorer cognitive performance on a visual-spatial task. Constructs from self-determination theory (i.e., global autonomous and controlled motivation) were included to help explain for whom the video effects might be strongest or weakest. Findings demonstrated that a global autonomous motivation orientation played a protective role against the effects of the female thin ideal. Given that autonomous motivation was a significant moderator, SDT is an area worth exploring further to determine whether motivational strategies can benefit men who are susceptible to media body ideals.

Keywords: female thin ideal; men's appearance schema; cognitive performance; Self-Determination Theory; autonomous motivation orientation; media effects

The Effects of Female “Thin Ideal” Media on Men’s Appearance Schema, Cognitive Performance, and Self-Evaluations: A Self-Determination Theory Approach

Media ideals of attractiveness have been recognized as powerful sociocultural sources of pressure among men and women (Barlett, Vowels, & Saucier, 2008; Blond, 2008; Levine & Murnen, 2009). While ample research has examined how exposure to same-sex media ideals affect men and women’s body image (for a meta-analysis see Ferguson, 2013), we know little about exposure to opposite-sex media ideals. In particular, a small number of studies have examined the effects of the female thin ideal on men’s body image and found that such media representations have adverse effects on boys’ and men’s subsequent self-evaluations (e.g., body dissatisfaction; Lavine, Sweeney, & Wagner, 1999) and cognitive functioning (e.g., appearance schema; Hargreaves & Tiggemann, 2002, 2003a), thereby identifying an alternative source of media appearance-related pressure that warrants attention.

To date, Lavine et al. (1999) found that men who were exposed to television advertisements (ads) that portrayed the female thin ideal evaluated their own body as less desirable and too thin as well as reported larger discrepancies between their actual and ideal body size (preferring a larger body size) compared to men who were exposed to neutral ads or the no ad condition. Based on their results, Lavine et al. proposed that for men, portrayals of the female thin ideal may articulate the importance of maintaining their physical appearance if they hope to pursue relationships with comparable women. Hargreaves and Tiggemann (2003b) found that for both adolescent girls and boys, initial body dissatisfaction in response to viewing a female thin ideal video predicted greater drive for thinness and body dissatisfaction two years later. Aubrey and Taylor (2009) found that men who were exposed to magazine ads portraying the female thin ideal reported significantly more appearance anxiety and appearance-related

reasons for exercise compared to men who were assigned to view ads portraying male models or ads with neutral content. In a subsequent study in the same article, Aubrey and Taylor (2009) included a romantic confidence measure to investigate a possible mechanism for explaining the effect of idealized portrayals of women on men. They proposed that exposure to the female thin ideal would increase men's self-consciousness because they would be reminded that in order to be successfully involved with women of similar attractiveness (i.e., sexually or romantically involved), they would need to conform to strict appearance standards. In general, their findings showed that men who were exposed to the female thin ideal ads reported significantly less romantic confidence, which in turn, partially mediated the influence of magazine exposure on body self-consciousness.

Furthermore, Hargreaves and Tiggemann (2002) found that exposure to idealized images of women in commercial ads had a significant effect on young men's cognitive functioning. Not only did male participants recall significantly more commercials in the female thin ideal condition, they also generated significantly more appearance words on the word-stem completion task compared to the control group, thus indicating more appearance schema activation. Similarly, Hargreaves and Tiggemann (2003a) found that among adolescent boys and girls, participants generated more appearance words on a word-stem completion task in the female thin ideal condition compared to the control condition. However, only girls who viewed the female thin ideal video reported significantly more body dissatisfaction compared to the control group. Boys did not report feeling more negative about their appearance in either group. Cikara, Eberhardt, and Fiske (2011) emphasized that idealized media portrayals of women can have deleterious consequences on the emotional, cognitive, and physical well-being of women and

heterosexual men in particular. At large, existing research supports the notion that female thin ideal media can negatively affect men's psychological and cognitive health.

For this reason, the current studies extend research on the adverse effects associated with the female thin ideal on men's appearance schema, cognitive performance, and self-evaluations. Given that body image scholars (e.g., Agliata & Tantleff-Dunn, 2004; Levine & Murnen, 2009; Tiggemann, 2014) acknowledge that body image-related research often fails to explain why some individuals are more resistant to the detrimental effects associated with the media than others, we integrated self-determination theory (SDT; Deci & Ryan, 1985, 2002) to examine whether two well-documented moderating factors, namely, autonomous and controlled motivation orientation (e.g., Mask et al., 2014), could identify for whom exposure to female thin ideal media has a weaker or stronger effect.

The Role of Autonomous and Controlled Motivation Orientation

According to Deci and Ryan (1985, 2002), SDT postulates that individuals encompass global levels of autonomous and controlled motivation that influence their everyday demeanor and orientation toward activities. Although situations and contexts can influence an individual's motivation in the moment, global levels of motivation are generally more stable over time (Vallerand & Ratelle, 2002). However, it's important to note that global motivation orientations are capable of transformation when individuals take steps to facilitate the change. For instance, a highly autonomous motivation orientation is experienced when a person engages in behaviors or activities for the interest and satisfaction they bring. Such individuals live their lives primarily free of will and autonomously by choosing what to engage in. Though now and then, these individuals may engage in behaviors or activities for reasons beyond mere satisfaction, this does not transform their global motivation orientation in life. Hence, autonomously oriented persons

generally live their lives making decisions that support their own psychological growth. Given the degree of self-determination experienced by autonomously oriented individuals, it is presumed that when these persons encounter everyday events or stimuli (such as messages portrayed in the media), they may choose to adhere to the situation or not, but the choice is under their discretion. When circumstances or stimuli, like some media messages, are undesirable, these persons regulate their perceptions, emotions, and behaviors thereby averting any negative effects (e.g., Perreault, Mask, Morgan, & Blanchard, 2014). Evidently, autonomous motivation is associated with less perceived pressure to conform to societal ideals, better emotional regulation, and less disordered eating (Mask & Blanchard, 2011a).

On the other hand, a more controlled motivation orientation is experienced when a person generally engages in an activity or behavior for externally regulated reasons like avoiding punishment or obtaining an award, or internally regulated reasons like guilt. Hence, controlled motivation is in evidence when the reason for doing things is to satisfy external demands or socially constructed contingencies (Vallerand & Ratelle, 2002). For example, amongst control oriented individuals, ideal media images may be perceived and interpreted as a source of pressure to conform. In fact, a controlled motivation orientation is indeed associated with experiencing more pressure to conform to beauty standards and greater body dissatisfaction (Mask & Blanchard, 2011b).

In addition, an autonomous motivation orientation is associated with feelings of “flow” (a state of focused involvement and enjoyment) and optimal performance in a number of domains including school, work, and sports (Deci & Ryan, 2002). A controlled motivation orientation however, is associated with decreased performance and in general, poor goal progress. Motives reflecting pressures to participate and motives resulting from the need for status or approval tend

to suppress competence. As will be discussed shortly, when exploring men's body image and cognition, an autonomous motivation orientation supports cognitive functioning even in circumstances that might try to undermine performance. Overall, the literature highlights the value of an autonomous motivation orientation compared to a controlled motivation orientation.

The principles of global autonomous and controlled motivation have been applied in several studies investigating the influence of same-sex media on women's body image. For example, Pelletier, Dion, and Levesque (2004) hypothesized that women with an autonomous motivation orientation would be less influenced by the female thin ideal and less susceptible to bulimic symptoms compared to women with a controlled motivation orientation. Indeed, they found that the more women were autonomously motivated in different aspects of their lives, the less they perceived sociocultural pressures to be thin and the less they engaged in disordered eating behaviors compared to women who reported more controlled motivation. Mask and Blanchard (2011b) found that following exposure to a female thin ideal video, women who reported more controlled motivation demonstrated more perceived pressure from the media to be thin, greater body dissatisfaction, and greater concerns over quantity of food consumed. Mask, Blanchard, and Baker (2014) found that after exposure to a female thin ideal video, women low on autonomous motivation also rated their appearance and competence more poorly compared to those who were high on autonomous motivation. Recently, Baker, Elnakouri, and Blanchard (2017) used the same moderation paradigm to explore the moderating roles of global autonomous and controlled motivation among men after exposure to the male muscular ideal. They found that men who scored high on autonomous motivation performed better on various cognitive tasks including visual-spatial processing and processing proficiency compared to those who scored low on autonomous motivation. Overall, findings support SDT and the notion that

not all individuals respond to sociocultural pressures to the same extent. As evidenced by theory and extant research, an autonomous motivation orientation in life could conceivably act as a moderator against negative media influences on body image-related concerns and cognitive functioning. Conversely, a controlled motivation orientation might predict increased vulnerability.

The Present Studies

The overall aim of the present studies was to add incrementally to this research by investigating the effect of a female thin ideal video on men's appearance schema, cognitive performance, and self-evaluations using a SDT framework. Consistent with Hargreaves and Tiggemann (2002), we hypothesized that men exposed to the female thin ideal would experience increased appearance schema activation compared to those in the control condition (Study 1), thereby indicating biases in attention which may suggest that additional cognitive consequences exist (a prerequisite for Study 2). We also contributed a novel perspective by incorporating SDT to assess the potential moderating roles of autonomous and controlled motivation in order to identify whether some men may be more vulnerable to or protected from experiencing an activated appearance schema following exposure (Study 1). Subsequently, we tested the effects of the female thin ideal on men's cognitive performance using a visual-spatial task (Study 2). Similarly, we hypothesized that men exposed to the female thin ideal would demonstrate poorer cognitive performance compared to men in the control condition. We also included an assessment of body esteem and hypothesized that men in the female thin ideal condition would report lower body esteem compared to those in the control condition (Study 2). Finally, by incorporating SDT, we hypothesized that an autonomous motivation orientation would protect men in the female thin ideal condition from experiencing negative cognitive and emotional

outcomes, whereas a more controlled motivation orientation might predict for whom the effects were worse (Study 2).

Pre-Study

A manipulation check was conducted on the female thin ideal video to ensure that the content focused on the appearance of the models and emphasized the value of a thin physique.

Participants

Undergraduate students from Bishop University were asked to participate in the video manipulation check ($N = 44$). Participants were not informed of the true purpose of the study nor did they partake in the experimental phase.

Experimental Stimuli

Two 5-minute videos comprised of commercial ads were created for the two studies. The female thin ideal video included a total of nine commercials: three commercials neutral in content to mask the true nature of the video and six commercials that highlighted appearance-based attributes of the female body (e.g., legs, buttocks, and abdomen). The ads emphasized the importance of having an appealing figure and drew attention to the model's physique. Sample ads included Victoria Secret lingerie, Jergens body lotion, and H&M apparel. The neutral video included nine commercials that displayed impartial or neutral content and had minimal images of humans. When humans were included, the focus was not on their physical appearance. Examples include a Tide laundry detergent ad that included children playing outside, a Pedigree dog food ad that featured a dog, and a Staples school supplies ad that featured images of stationary products. The ads had no relation to appearance and drew attention toward the product.

Female Thin Ideal Video Manipulation Check

Perceptions of the video's content portraying the female thin ideal was assessed using a 9-item survey (Mask et al., 2014). Items included "the models' thinness was highlighted in the ads," "the models' physical attractiveness was the focal point of the ads," and "the models' sexual appeal was highlighted in the ads." Each item was rated on a scale ranging from 1 (*do not agree at all*) to 7 (*strongly agree*). The reliability of the items was good ($\alpha = .94$). A principal components analysis supported a one-factor solution which accounted for 69.81% of the total variance. Responses were then averaged together across the nine items and evaluated against the scale's mid-point of 4. Perceptions of the female thin ideal content in the video were supported ($M = 6.21$, $SD = 0.55$), $t(42) = 27.23$, $p < .001$. We therefore used the thin ideal video in the subsequent studies as our experimental manipulation.

Study 1

Extending Hargreaves and Tiggemann's (2002) study that explored the effects of a female thin ideal video on adolescent boys' appearance schema activation, we investigated whether a female thin ideal video would influence undergraduate men's appearance schema while integrating a novel perspective exploring the moderating effects of autonomous and controlled motivation orientation.

Method

Participants. The sample was comprised of 201 heterosexual male university students enrolled in first year psychology courses. Participants' age ranged between 16 and 29 years ($M = 19.53$, $SD = 1.92$). The majority were White (51.7%), followed by Asian (12.9%), African American (10.4%), Middle Eastern (10.4%), Indian (4.0%), and other (10.6%, e.g., multiracial). A total of 28 participants were excluded because they identified as gay, bisexual, or were unidentified. Participants identified as single (67.7%), in a relationship (21.4%), dating (10.0%),

or engaged (1.0%). Self-reported weight (in pounds) and height (in feet and inches) were used to calculate their body mass index (BMI). Participants' BMI ($M = 23.92$, $SD = 3.41$) averaged around normal weight according to the Health Canada classification system (2003).

Experimental stimuli and procedure. The videos from the pre-study (i.e., female thin ideal and control video) were used to create the two conditions. Male participants were recruited through an Integrated System of Participation in Research at the University of Ottawa under the pretext that the study was on “YouTube and Advertising” and aimed to understand individual perceptions of advertisements.

Participants first completed assessments of their autonomous and controlled motivation orientation and demographic information. Afterward, they were randomly assigned using the “Random Stimulus Assignment” feature in PsychData to view one of the two videos. Following exposure, a word-stem completion task was used to assess appearance schema activation. We disguised the purpose of the activity by indicating that the task was to delay upcoming memory questions. To conclude, participants completed cover story questions that asked participants to recall the products advertised in the video. They received partial course credit in exchange for their participation.

Measures.

Autonomous and controlled motivation orientation. Participants' autonomous and controlled motivation were assessed with the 28-item Global Motivation Scale (GMS; Guay, Mageau, & Vallerand, 2003). The GMS is comprised of five subscales that correspond to the motivational constructs conceptualized by SDT (Deci & Ryan, 1985, 2002). Participants rated the extent to which each of the items corresponded to the reasons why they do things in general. Responses were scored on a scale from 1 (*does not correspond at all*) to 7 (*corresponds*

completely). Sample items include “for the enjoyable feelings I experience” (intrinsic regulation), “because I choose them as a means to attain my objectives” (identified regulation), “because otherwise I would feel guilty for not doing them” (introjected regulation), “because I want to be viewed more positively by certain people” (external regulation), and “although I do not see the benefit in what I am doing” (amotivation). To compute the autonomous motivation index, scores were averaged across the intrinsic and identified regulation items, whereas the controlled motivation index was computed by averaging scores on the external and introjected regulation items (Chemolli & Gagne, 2014; Deci & Ryan, 2008b). The amotivation subscale was not included in the calculation of autonomous or controlled motivation. The internal consistency was acceptable ($\alpha = .92$ and $.83$, respectively) and consistent with previous research with 372 undergraduate students (e.g., $\alpha = .89$ and $.80$, respectively; Lumb, 2015).

Appearance schema activation. A modified 22-item word-stem completion task (Hargreaves & Tiggemann, 2002; Tiggemann, Hargreaves, Polivy, & McFarlane, 2004) was used to assess the salience of appearance-related information after exposure to the video. The rationale was that men whose appearance schemata have been activated will produce more appearance-related words compared to those who did not experience an activated appearance schema. Participants were presented with 3-letter word-stems that could be completed to represent an appearance-related word or non-appearance-related word. For example, the stem “MUS____” could be completed as muscular or music. Respondents’ scores could range from 0 to 22, with higher numbers indicating stronger appearance schema activation. Two trained and independent judges coded all of the participant generated words. Our inter-rater reliability was acceptable as Cohen’s kappa ranged between $.90$ and $.99$. The inter-rater reliability was similar

to previous studies indicating intercorrelations between .88 and 1.0 among samples of high school men and women (Hargreaves & Tiggemann, 2002).

Demographic information was recorded including age, ethnicity, sexual orientation, relationship status, weight, and height. BMI was calculated using self-reported weight and height.

Results

Preliminary analyses.

Preliminary analyses were performed using IBM SPSS 23 including data screening and testing assumptions. Initially, we ran a missing value analysis (MVA) and found that 8% of data was missing at random. Following inspection, a total of 13 participants were identified with concentrated sums of missing data following the video. Potential problems with Internet connectivity may have caused such issues. We removed the cases given that the outcome measures for these participants were incomplete and re-ran the MVA for the remaining 201 participants. Less than 5% of the data was missing completely at random and expectation maximization methods were used to impute missing values. Basic assumptions of linearity and normality were met given the large sample size. Homogeneity of variance across groups was first assessed using the Levene's test which indicated heterogeneity of variance (i.e., the test was significant). Given that the test is quite conservative, we proceeded with the F-Max test and found that the variance across groups was roughly equal and thus, the assumption of homogeneity of variance was met. During the moderation analyses, autonomous and controlled motivation were mean centered to reduce variance inflation factors or multicollinearity.

Group comparisons.

Demographic characteristics. Men assigned to the female thin ideal video condition and men assigned to the control condition were relatively equivalent on age, $t(199) = 1.23, p = .221$, autonomous motivation, $t(199) = 0.79, p = .432$, controlled motivation, $t(199) = -0.95, p = .344$, and BMI, $t(199) = 2.06, p = .041$, based on the Bonferroni correction. Thus, randomization created similar groups. Descriptive statistics across video conditions are displayed in Table 1.

Effect of video on appearance schema activation. Table 1 also provides the means for the men in the female thin ideal condition and control condition on appearance schema activation following exposure to the videos. An independent samples t -test confirmed a significant difference between men in the female thin ideal video group ($M = 8.07, SD = 3.46$) and men in the control video group ($M = 6.53, SD = 2.34$) on appearance schema activation $t(199) = -3.66, p < .001, d = 0.52$. As seen from the means, exposure to the female thin ideal video predicted significantly more appearance-related words on the word-stem completion task, thus indicating more appearance schema activation, compared to men in the control condition.

Multiple moderation analysis. A multiple moderation analysis was conducted using the SPSS macro PROCESS to generate regression coefficients and bootstrap confidence intervals with 5000 iterations (Hayes, 2012, 2013). In the model tested, we included both autonomous and controlled motivation as moderators of the link between video condition and appearance schema activation. We also controlled for BMI and found that the results were the same when BMI was excluded. We therefore provide the results without BMI.

The coefficients for this model are presented in Figure 1. The overall model was significant, $R^2 = .25, F(5, 195) = 11.23, p < .001$, explaining roughly 25% of the variance in appearance schema activation. Results indicated that the main effect of video on appearance schema activation (when holding autonomous and controlled motivation constant) was

significant, $b_1 = 1.46, p < .001$. The effect of autonomous motivation on appearance schema activation was marginally significant, $b_2 = -.45, p = .087$. Patterns revealed that men who reported higher levels of autonomous motivation generated fewer appearance-related words on the word-stem task compared to men who reported low levels of autonomous motivation. The effect of controlled motivation on appearance schema activation was nonsignificant, $b_3 = .09, p = .694$. The predicted interaction between autonomous motivation and video on appearance schema activation (when holding controlled motivation constant) was significant, $b_4 = -1.27, p = .009$. The interaction showed that men in the female thin ideal video group with high levels of autonomous motivation generated fewer appearance-related words on the word-stem completion task compared to men with lower levels of autonomous motivation (please refer to Figure 2 for a graph of the interaction). When comparing the two groups, men in the female thin ideal video group on average generated more appearance-related words on the word-stem task ($M = 8.07, SD = 3.46$) compared to men in the control video group ($M = 6.53, SD = 2.34$). When autonomous motivation orientation is high, appearance schema activation scores are low for both video conditions. Lastly, the interaction between controlled motivation and video on word-stem completion score was nonsignificant, $b_5 = -.59, p = .122$. Overall, autonomous motivation uniquely accounted for 2.89% (R^2 change = .029) of the variance in appearance schema activation, $F(1, 195) = 7.06, p = .009$, and controlled motivation accounted for a nonsignificant 0.94% (R^2 change = .009) of the variance, $F(1, 195) = 2.42, p = .122$.

To summarize, we found that exposure to the female thin ideal increased the number of appearance-related words men generated on the word-stem completion task, thus indicating more appearance schema activation compared to men in the control group. Furthermore, our findings demonstrated that an autonomous motivation orientation significantly moderated the effects of

the female thin ideal on men's appearance schema activation. Men who were exposed to the female thin ideal video and who scored high on autonomous motivation orientation generally indicated less appearance schema activation compared to men who were exposed to the female thin ideal video yet scored low on autonomous motivation. Controlled motivation orientation did not have a significant role in predicting men's appearance schema activation.

Study 2

Given that Study 1 found that exposure to the female thin ideal video had a significant effect on men's cognitive schema, we suspected that there may be additional interferences in cognitive processing necessary for optimal cognitive performance. Research reveals that a person's cognitive schema as well as cognitive functioning such as working memory, visual-spatial abilities, and logical reasoning (e.g., Baker et al., 2017; Gay & Castano, 2010; Rodgers & DuBois, 2016) can be disrupted following exposure to same-sex media body ideals. At this time, no published studies have explored cognitive performance outcomes with opposite-sex media ideals. We therefore investigated the effects of viewing the female thin ideal video on men's cognitive performance using a visual-spatial processing task (a task in which men are typically high performers). In addition, we included a measure of body esteem to evaluate the effects of viewing the female thin ideal video on men's self-evaluations. Similar to Study 1, we considered the moderating roles of autonomous and controlled motivation orientation.

Method

Participants. The sample comprised of 72 heterosexual male university students enrolled in first year psychology courses; nine participants were not included in the sample because they identified as gay or remained undisclosed. Of the 72 men in the sample, participants' age ranged between 17 and 25 years ($M = 18.71$, $SD = 1.50$). The majority of men were White (59.7%),

followed by African American (9.7%), Asian (8.3%), Arabic (5.6%), Hispanic (1.4%), and other (13.9%, e.g., multiracial). One participant did not disclose his ethnicity. Participants identified as single (55.6%), in a relationship (26.4%), dating (16.7%), or married (1.4%). Self-reported weight (in pounds) and height (in feet and inches) were used to calculate BMI. Participants' BMI ($M = 23.53$, $SD = 3.09$) averaged around normal weight according to the Health Canada classification system (2003). Participants received partial course credit in exchange for their participation.

Experimental stimuli and procedure. The videos used (i.e., the female thin ideal and control video) were also from the pre-study. Male participants were recruited under the same pretext “YouTube and Advertising” and aimed to understand individual perceptions of advertisements and consumer behavior. Participants first completed assessments of their autonomous and controlled motivation orientation and demographic information. Afterward, they were randomly assigned to view one of the two videos using an a priori “random number generator” (www.randomizer.org). Following exposure, a Soma puzzle activity was used to assess cognitive performance on a visual-spatial task. Finally, a series of survey questions about self-esteem, body esteem, and cover story items were included.

Measures.

Autonomous and controlled motivation orientation. The two constructs were assessed using the 18-item General Motivation Scale (Pelletier et al., 2005), a short version of the 28-item GMS (Guay et al., 2003). Given the length of the experiment, the short version of the GMS was preferable. Participants rated the extent to which each of the items corresponded to their reasons for why they do things in general (e.g., “because I like making interesting discoveries” [intrinsic regulation], and “because I want to be viewed more positively by certain people” [external

regulation])). Responses ranged from 1 (*does not correspond at all*) to 7 (*corresponds completely*). To compute the autonomous motivation index, scores were averaged across the intrinsic and identified regulation items (nine items), whereas the controlled motivation index was computed by averaging scores on the external and introjected regulation items (six items). The amotivation subscale was not included in the computation of autonomous or controlled motivation. The internal consistency was acceptable (α s = .83 and .86, respectively) and comparable to previous research using the short-version among a sample of undergraduate women (e.g., α s = .79 and .76 respectively; Mask et al., 2014).

Cognitive performance on a visual-spatial orientation task. A Soma puzzle activity was used to measure performance accuracy and perceived difficulty on a challenging yet engaging visual-spatial cognitive task (Deci, 1971; Enzle & Ross, 1978). Cognitive tests assessing visual-spatial abilities typically measure accuracy (such as the Cube Comparison Test) to evaluate performance. Similar to Tiggemann and Boundy's (2008) assessment of visual-spatial abilities, participants received a score of +1 for accurate completion per puzzle and 0 for each incorrect puzzle. We also included a measure of perceived difficulty because we expected that some men would find the puzzles more challenging than others especially given the time constraints irrespective of accurately solving the puzzles. Participants rated each puzzle's difficulty on a scale ranging from 1 (*not at all difficult*) to 7 (*extremely difficult*). Overall, participants were asked to replicate five Soma puzzle configurations with the blocks provided. The puzzles ranged from extremely easy (Puzzle 1) to extremely difficult (Puzzle 5). Participants were given 20 minutes to work on all five puzzles. They were encouraged to attempt each puzzle during this timeframe without sacrificing accuracy. Provided that the disruption of cognitive functioning is generally observed during difficult tasks rather than easy tasks (Deci & Ryan, 2002), we

hypothesized that the cognitive effects (poor accuracy and increased perceived difficulty) would likely occur during the difficult levels (i.e., Puzzles 4 and 5).

Body esteem. Self-evaluations of men's body esteem were assessed using the Upper Body Strength and Physical Condition items from the men's version of the Body Esteem Scale (BES; Franzoi & Shields, 1984). Both subscales were included in order to measure the dual nature of men's body image, namely, muscularity and low body fat/physical fitness (Jones & Crawford, 2005). Each item was evaluated with a Visual Analogue Scale (VAS; Grant et al., 1999) to quantify immediate feelings. VASs are used to assess emotional states and body dissatisfaction in a highly sensitive fashion by permitting small state changes to be detected even for participants who are more reluctant to report extreme levels of mood and body disturbance (Gift, 1989). Since men may underreport negative feelings toward their own bodies (Anderson, 2013; Kaminski, Chapman, Haynes, & Own, 2005), the VAS method may reveal subtle differences that might otherwise be obscured by other methods. Each VAS consisted of a 16 centimetre (cm) horizontal line labelled with *extreme negative feelings* on the far left (0 cm), *no feelings either way* in the middle (8 cm), and *extreme positive feelings* on the far right (16 cm). Attributes concerning the body's appearance (i.e., biceps, width of shoulders, arms, chest, body build, muscular strength) were derived from the Upper Body Strength subscale and attributes concerning the body's competence (i.e., overall health, weight, physical coordination, stomach's appearance, thighs, waist, reflexes, physical stamina, figure or physique, agility, energy level, physical condition) were derived from the Physical Condition subscale. Participants were asked to indicate how they felt "right now" toward each attribute by marking a small vertical line or slash somewhere on the line. Responses were measured to the nearest millimetre, with higher scores indicating more positive feelings and lower scores indicating more negative feelings. A

strength composite was established by averaging the six strength attributes and a physical condition composite was computed by averaging the 12-body competence-based attributes. Cronbach's coefficient alphas were .91 and .95, respectively, for these composites. Likewise, a comparable study indicated reliabilities of .85 and .86, respectively, among a sample of undergraduate men (Franzoi & Shields, 1984).

Demographic information inquired was the same as Study 1.

Results

Preliminary analyses.

Preliminary analyses were performed using IBM SPSS 23 including data screening and testing of assumptions. Following a missing value analysis (MVA), we decided to omit Puzzle 5 because over 10% of data were missing on this item. Due to the time constraints, participants often ran out of time in the midst of working on Puzzle 5. Once omitted, no missing data were reported. Three outliers were identified on age because these participants were slightly older (24 or 25) compared to the rest of the sample ($M = 18.71$). However, no transformations were made because age was merely for descriptive purposes and not included in the main analyses. Inspection of the means and standard deviations of each variable included in the main analyses indicated that all values were within the theoretical range (see Table 2). Values of kurtosis and skewness were all within acceptable range (-1.38 to 0.86 and -1.23 to 1.95, respectively). From a multivariate perspective, the distribution of standardized residuals appeared normal. Furthermore, given the number of dependent variables and the sample size, we applied Box's M test and Levene's test to reveal that homogeneity of variance-covariance and variance was met. During the moderation analyses, autonomous and controlled motivation were mean centered to reduce the prospect of multicollinearity.

Group comparisons.

Demographic characteristics. Descriptive statistics across video conditions are displayed in Table 2. Men assigned to the female thin ideal video condition and men assigned to the control condition were relatively equivalent on age, $t(70) = 1.71, p = .091$, autonomous motivation, $t(70) = -0.05, p = .960$, controlled motivation orientation, $t(70) = 0.29, p = .775$, and BMI, $t(70) = 2.14, p = .036$, after applying the Bonferroni adjustment.

Effect of video on cognitive performance. Table 2 also provides the means for the female thin ideal video condition and control video condition on accuracy and perceived difficulty for each Soma Puzzle. The first three independent samples t -tests were used to set the stage for our analysis of interest and to show that the hypothesized effects related to the difficult puzzle (Puzzle 4) were not spurious. Overall, the three independent samples t -tests revealed nonsignificant differences between the two video groups on puzzle accuracy for the easy and moderately easy puzzles. Specifically, accuracy on Puzzle 1, $t(70) = -0.51, p = .610$, Puzzle 2, $t(70) = -0.11, p = .912$, and Puzzle 3, $t(70) = -0.35, p = .725$, were similar across video conditions. We specifically hypothesized that differences would emerge on the difficult puzzle (i.e., Puzzle 4). The difference between the female thin ideal video group ($M = 0.41, SD = 0.50$) and control video group ($M = 0.68, SD = 0.47$) on Puzzle 4 accuracy was indeed significant, $t(70) = 2.33, p = .022, d = 0.58$.

Three initial independent samples t -tests were also conducted on level of perceived difficulty for the easy and moderately easy puzzles. Perceived difficulty was nonsignificant across video groups on Puzzle 1, $t(70) = -0.29, p = .771$, Puzzle 2, $t(70) = -0.53, p = .598$, and Puzzle 3, $t(70) = -0.53, p = .599$. A significant difference between the female thin ideal video group ($M = 5.39, SD = 1.45$) and control video group ($M = 4.44, SD = 1.37$) was found on Puzzle

4 perceived difficulty, $t(70) = -2.81, p = .006, d = 0.67$. According to the means, exposure to the female thin ideal video predicted more perceived difficulty on Puzzle 4 compared to the control condition.

Effect of video on men's body esteem. Table 2 displays the means for the female thin ideal video group and control video group on perceived strength and physical condition after video exposure. Based on the means, groups did not differ on their self-evaluations of perceived strength, $t(70) = 0.88, p = .272$, or perceived physical condition, $t(70) = 1.01, p = .281$. Therefore, the female thin ideal video did not have an effect on men's body esteem as expected.

Multiple moderation analyses. To further explore the significant results pertaining to cognitive performance on Puzzle 4, we employed a similar method as Study 1 to assess the moderating roles of autonomous and controlled motivation orientation. The multiple moderation analyses were performed with and without controlling for BMI and the results were similar. Hence, we provide the results without controlling for BMI.

A multiple moderation was used to test the interactions between video condition and autonomous motivation (moderator 1) and controlled motivation (moderator 2) on Puzzle 4 accuracy. The coefficients for this model are presented in Figure 3. The overall model was significant, Cox-Snell $R^2 = .26, p < .001$, in Puzzle 4 accuracy. The results indicated that the main effect of video on Puzzle 4 accuracy (when holding autonomous and controlled motivation constant) was significant, $b_1 = -1.58, p = .008$. The effect of autonomous motivation on Puzzle 4 accuracy was also significant, $b_2 = 1.5, p = .012$. In general, the more autonomous motivation, the more likely the participant accurately completed the difficult puzzle. The effect of controlled motivation on Puzzle 4 accuracy was also significant, $b_3 = -.76, p = .048$. The result suggests that the more controlled motivation reported, the less likely the participant was able to accurately

complete Puzzle 4. The interaction among autonomous motivation and video condition on Puzzle 4 accuracy (when holding controlled motivation constant) was nonsignificant, $b_4 = -.16, p = .856$. Likewise, the interaction between controlled motivation and video on Puzzle 4 accuracy was nonsignificant, $b_5 = .52, p = .327$. Due to the fact that the outcome was a dichotomous variable, PROCESS cannot generate effect sizes.

A multiple moderation was also conducted to test the interactions between video condition and autonomous motivation (moderator 1) and controlled motivation (moderator 2) on Puzzle 4 perceived difficulty. The coefficients are reported in Figure 4. The overall model was significant, $R^2 = .34, F(5, 66) = 13.21, p < .001$, explaining 34% of the variance in perceived difficulty. Results indicated that the main effect of video on Puzzle 4 perceived difficulty (when holding autonomous and controlled motivation constant) was significant, $b_1 = .96, p = .002$. The effect of autonomous motivation on perceived difficulty was also significant, $b_2 = -.56, p = .008$. In general, men who scored high on autonomous motivation perceived less difficulty on Puzzle 4 compared to men who scored low on autonomous motivation orientation. The effect of controlled motivation on perceived difficulty was nonsignificant, $b_3 = .08, p = .631$. A significant interaction between autonomous motivation and video condition on perceived difficulty (when holding controlled motivation constant) was found, $b_4 = -.58, p = .046$. A visual representation of the interaction is displayed in Figure 5. Men in the female thin ideal video condition who reported higher levels of autonomous motivation perceived the puzzle to be less difficult compared to men with lower levels of autonomous motivation. Similarly, men in the control group who demonstrated higher levels of autonomous motivation reported less perceived difficulty compared to those with low levels of autonomous motivation. When comparing the two video conditions, men in the female thin ideal video condition, on average, reported more

perceived difficulty on Puzzle 4 ($M = 5.39$, $SD = 1.45$) compared to men in the control condition ($M = 4.44$, $SD = 1.37$), $t(70) = -2.81$, $p = .006$, $d = 0.67$. The interaction between controlled motivation and video on perceived puzzle difficulty was nonsignificant, $b_5 = -.11$, $p = .607$. Autonomous motivation uniquely accounted for 2.64% (R^2 change = .026) of the variance in perceived difficulty, $F(1, 66) = 4.12$, $p = .046$, whereas controlled motivation accounted for a nonsignificant 0.19% (R^2 change = .002) of the variance, $F(1, 66) = 0.27$, $p = .607$.

At large, we found that the female thin ideal video elicited significant negative effects on men's ability to accurately solve a difficult 3-dimensional puzzle and on perceived difficulty. Consistent with our hypotheses, we also found that for the easier puzzles, cognitive performance did not differ between the two video groups. In addition, although our findings did not reveal a significant effect of video on men's body esteem, the nonsignificant results might be due to the fact that following video exposure men engaged in a cognitive task that delayed their self-evaluative responses.

Finally, our findings demonstrated that, in general, men who were high on autonomous motivation had more accuracy on a challenging puzzle and perceived less difficulty compared to men who scored low on autonomous motivation. Controlled motivation orientation did not play a moderating role on men's cognitive performance.

General Discussion

Men are increasingly experiencing muscle dysmorphia (Santos Filho, Tirico, Stefano, Touyz, & Claudino, 2016), body dissatisfaction (Brennan, Lalonde, & Bain, 2010), low body esteem (Olivardia, Pope, Borowiecki, & Cohane, 2004), and severe eating disturbances (Strother, Lemberg, Stanford, & Turberville, 2012). Evidently, a main source contributing to such negative effects is the media (see Barlett, Vowels, & Saucier, 2008 for a meta-analysis). Though research

on same-sex media portrayals is pertinent and well-established (e.g., Derenne & Beresin, 2006; Martins, Tiggemann, & Kirkbride, 2007; Tiggemann, Martins, & Kirkbride, 2007), exposure to opposite-sex media body ideals is far less understood.

The present studies aimed to examine the effects of the female thin ideal on men's cognitive schema, cognitive performance, and self-evaluations. It was hypothesized that more negative effects would arise for men exposed to the female thin ideal video compared to men in the control condition. Overall, the findings revealed that the female thin ideal video had a deleterious effect on men's cognitive schema (thereby biasing cognitive processing) and cognitive performance on a difficult visual-spatial task. Aubrey and Taylor (2009) proposed that the impact of the female thin ideal on men may be explained in part, by the participants' evaluations of the way they would need to appear to attract such women. We drive this proposition further and propose that the nature of such content might actually reinforce perceptions of strict body ideals for both men and women. Men might infer female thin ideal content in terms of broader body ideals, especially since the message of female media portrayals underlines the general value of appearance. Accordingly, the female thin ideal may trigger beliefs about the ideal self not specific to gender. The significant increase in appearance schema activation after exposure to female thin ideal media provides support for the notion that idealized portrayals of women trigger global ideal body concepts (e.g., CALories, ABDomen) and not necessarily limited to perceptions and beliefs about the female body (e.g., PREtty). Prospective research should address how the female thin ideal affects men by exploring potential mediating variables. An active appearance schema might mediate the effects on cognitive performance following exposure to the female thin ideal. Alternatively, the degree of conformity to masculine norms or self-esteem might also explain the effects of opposite-sex media on men.

Furthermore, SDT was employed to explore the potential moderating effects of global autonomous and controlled motivation. As similarly found among women (Mask & Blanchard, 2011b; Mask et al., 2014; Pelletier et al., 2004) and men (Baker et al., 2017) in same-sex media research, we hypothesized that an autonomous motivation orientation would play a protective role against the negative outcomes associated with media body ideals. Our findings were generally in line with the literature. In Study 1, autonomous motivation moderated the effects on appearance schema activation. In Study 2, autonomous motivation moderated the effects of the female thin ideal on perceived puzzle difficulty, though not on puzzle accuracy, during a visual-spatial orientation task. A global autonomous motivation has a beneficial role that should be explored in forthcoming body image-related studies to truly understand the extent of its potential and ability to compliment treatment programs.

On the other hand, controlled motivation orientation was tested as a moderator because research has also shown that more global controlled motivations are associated with negative indicators of well-being (Deci & Ryan, 2008a; Ryan & Deci, 2000), poor self-evaluations (Pelletier et al., 2004), and poor performance (Deci & Ryan, 2008b), especially in circumstances where external pressures are amplified. However, contrary to our hypotheses, controlled motivation orientation did not play a significant moderating role on cognitive functioning. Accordingly, recent SDT studies suggest that an individual's level of controlled motivation may be less influential compared to their level of autonomous motivation (Liu et al., 2009; Van den Broeck et al., 2012). Although this postulation requires investigation, our findings reveal that an autonomous motivation orientation in life can help buffer the effects associated with negative external pressures such as the media. Similar to Koestner et al. (2008), we suggest that individuals ought to focus on enhancing their autonomous motivation rather than on reducing

their controlled motivation to improve cognitive functioning and performance since the relative importance of controlled motivation was not clearly distinguished.

Overall, based on empirical and theoretical grounds, intervention strategies to enhance autonomous motivation are well-documented. The most common approach to establish and embrace a more global autonomous motivation in life involves supporting our basic psychological needs such as competence, relatedness, and autonomy through various means (Deci & Ryan, 2008). For example, feeling involved with a family or group (relatedness) can facilitate the internalization of values that give impending behaviors meaning and purpose. Also, feeling competent to enact behaviors, exploring challenges, and seeking opportunities (competence) can help integrate a behaviors value. Lastly, experiencing choice and freedom in life (autonomy) can help increase the experience of autonomous motivation. Counselling and cognitive-behavioural therapy (CBT) can help strategize and implement ways to increase feelings of relatedness, competence, and autonomy as well as offer strategies to minimize coercive controls such as rewards and comparisons with others (Ryan, Lynch, Vansteenkiste, & Deci, 2011).

Limitations and Future Directions

The current studies are not without limitations. First, we must take caution when interpreting the results for the self-evaluative outcomes because the measures were administered after the cognitive task (i.e., Soma puzzle task) and may not be a direct effect of the video but rather, an indirect effect. It is possible that the cognitive task interrupted the video effects on men's body esteem which may explain the nonsignificant results. However, given that evidence supports the deleterious effect of the female thin ideal on men's self-evaluations (e.g., Aubrey & Taylor, 2009; Cikara et al., 2011), it was a secondary hypothesis in our research. Second, the

samples were comprised of university students enrolled in first year psychology courses. The results may not be generalizable to other age groups or different educational backgrounds. Third, athletic status was not controlled for in the studies. There is a growing literature specific to male athletes and bodybuilders that provides evidence suggesting that this subgroup of men tends to be more vulnerable to content portraying body ideals (Petrie, Greenleaf, Reel, & Carter, 2008). Future research should take athletic status into consideration to explore individual differences. Fourth, video exposure in each condition was quite short in duration. Although research suggests that body ideals can have immediate effects on viewer's cognition, emotion, and behavior (e.g., Mulgrew, Volcevski-Kostas, & Rendall, 2014), the study of opposite-sex media portrayals on such outcomes is relatively new and perhaps the results would be more apparent (i.e., larger effect sizes) if the manipulation was stronger or perhaps longer (30 minutes compared to five minutes in duration). Prospective research should use alternative media content to test the effect of the female thin ideal on male viewers such as music videos or time spent looking through magazine ads because these undertakings tend to last longer. Fifth, although the evidence herein appears to support the media's negative impact on appearance schema and cognitive performance, experimental designs have been criticized for their lack of ecological validity (e.g., Stice, Spangler, & Agras, 2001) and short-lived effects (Hargreaves & Tiggemann, 2003; Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). Hence, it remains unknown whether exposure to the female thin ideal can disturb men's ability to optimally perform in everyday tasks like using information for navigation, fixing equipment, estimating distance or measurement, and ultimately performing on a job. Future research should investigate the effects of female thin ideal media in ecologically sound settings such as performance at school and work to understand the extent of the effects. Lastly, testing the effects of the female thin ideal on

alternative cognitive tasks would support our unique findings. For example, an objective measure of cognitive performance such as the Modified Stroop task may provide a more precise assessment of performance.

Despite these limitations, the research contributes to the meagre but emerging literature that proposes that viewing portrayals of the female thin ideal can have immediate adverse effects on men's cognitive, behavioral, and emotional health. Researchers and practitioners should be mindful of the pressures elicited from opposite-sex media content as it has been overlooked in the past. Future research should investigate exposure to this kind of media content for a full comprehension of men's body image and the forces that shape it. Finally, coupled with SDT, we found significant moderating effects that help explain why some men are more protected against negative outcomes associated with media body ideals. Specifically, the role of autonomous motivation orientation seems to be an area worth further exploring in relation to body image, particularly if protective strategies can be applied as a practical means to help those who are more vulnerable to media body ideals.

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Table 1
Study 1 Means (SD) for Descriptive Statistics and Main Analyses across Video Conditions

	Video Type	
	Thin Ideal Video Condition (<i>N</i> = 105)	Neutral Video Condition (<i>N</i> = 96)
Age	19.35 (1.96)	19.69 (1.87)
BMI	23.41 (3.34)	24.40 (3.43)*
Motivation orientation		
Autonomous motivation	5.05 (0.90)	5.14 (0.88)
Controlled motivation	4.29 (1.10)	4.15 (1.07)
Cognitive schema		
Word-stem completion task	8.07 (3.46)	6.53 (2.34)***

* $p < .05$, *** $p < .001$.

Table 2

Study 2 Means (SD) for Descriptive Statistics and Main Analyses across Video Conditions

	Video Type	
	Thin Ideal Video Condition (<i>N</i> = 32)	Neutral Video Condition (<i>N</i> = 40)
Age	18.37 (0.94)	18.97 (1.79)
BMI	22.68 (3.19)	24.21 (2.86)*
Motivation orientation		
Autonomous motivation	5.07 (0.81)	5.06 (0.91)
Controlled motivation	3.98 (1.17)	4.07 (1.24)
Puzzle accuracy		
Soma Puzzle 1	0.81 (0.40)	0.76 (0.45)
Soma Puzzle 2	0.69 (0.47)	0.67 (0.47)
Soma Puzzle 3	0.67 (0.55)	0.63 (0.49)
Soma Puzzle 4	0.41 (0.50)	0.68 (0.47)*
Perceived puzzle difficulty		
Difficulty Puzzle 1	3.28 (2.04)	3.43 (2.11)
Difficulty Puzzle 2	4.31 (2.04)	4.07 (1.76)
Difficulty Puzzle 3	4.84 (1.55)	4.62 (1.82)
Difficulty Puzzle 4	5.39 (1.45)	4.44 (1.37)**
Self-evaluation		
Perceived Strength	9.46 (2.73)	10.02 (2.64)
Perceived Physical Condition	10.23 (2.50)	10.85 (2.64)

* $p < .05$, ** $p < .01$.

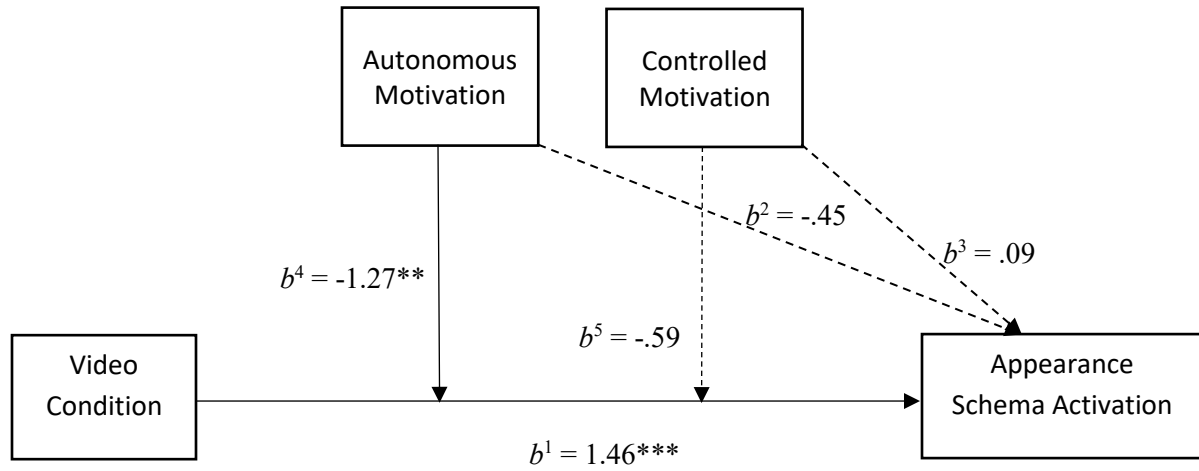


Figure 1. Study 1. Multiple moderation analysis on appearance schema activation ($N = 201$).

Note. Dashed paths are nonsignificant.

* $p < .05$, ** $p < .01$, *** $p < .001$.

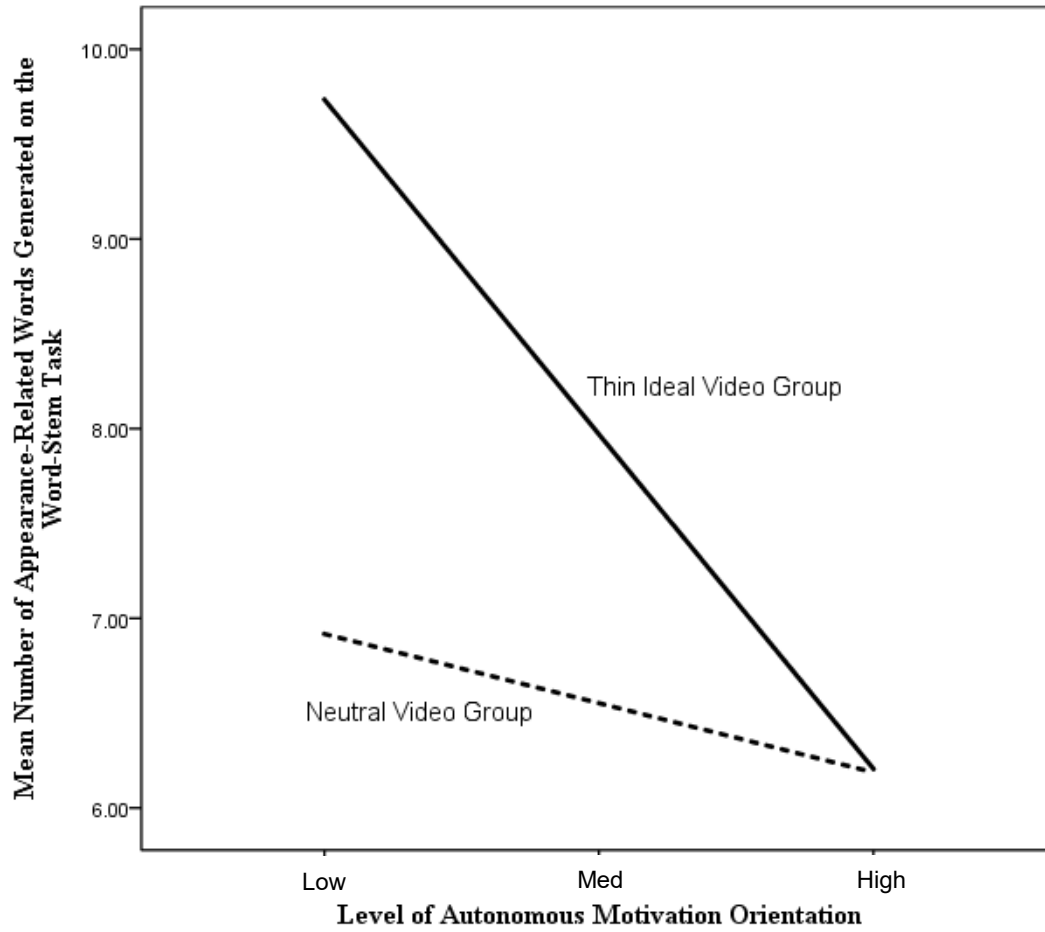


Figure 2. Study 1. The interaction between video condition and autonomous motivation orientation on word-stem completion performance (i.e., appearance schema activation; $N = 201$).

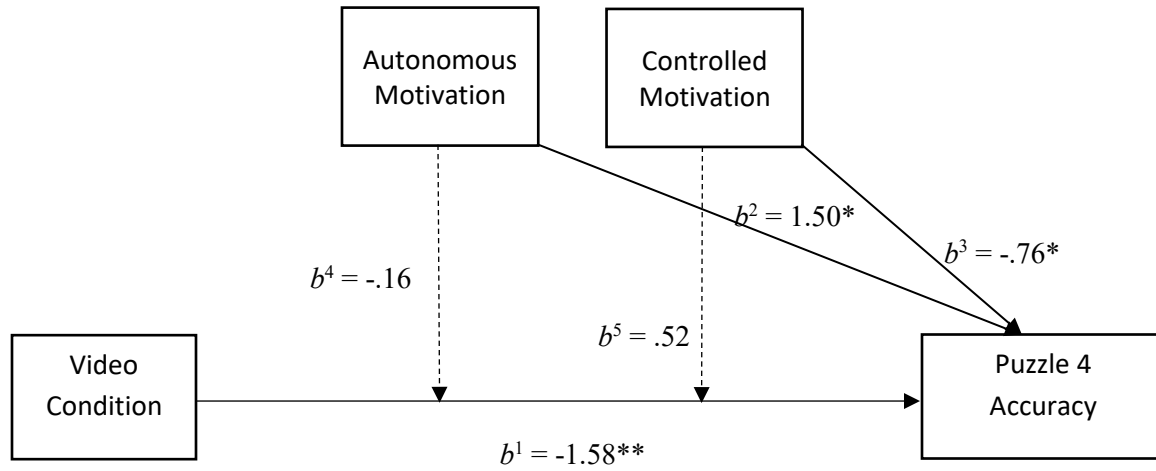


Figure 3. Study 2. Multiple moderation analysis on Puzzle 4 accuracy ($N = 72$).

Note. Dashed paths are nonsignificant.

* $p < .05$, ** $p < .01$.

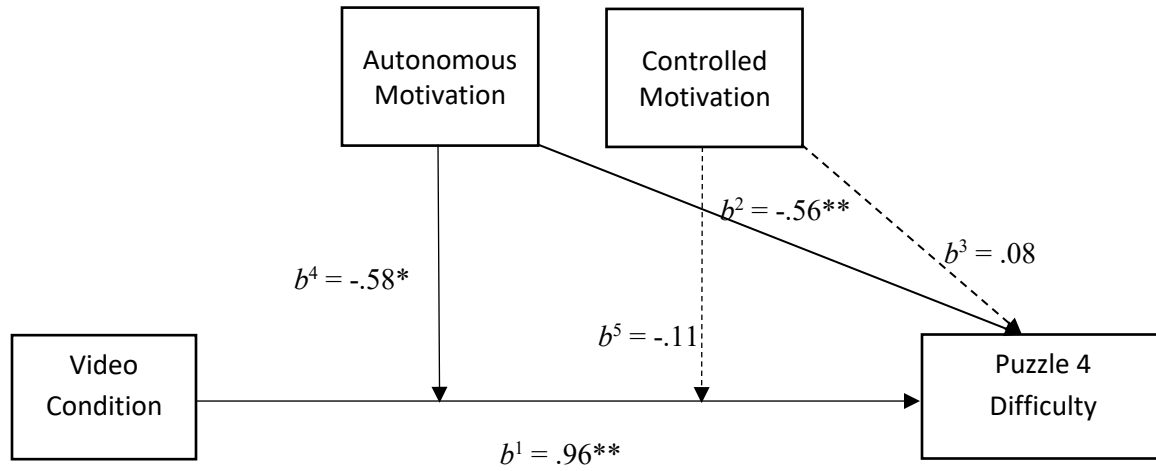


Figure 4. Study 2. Multiple moderation analysis on Puzzle 4 perceived difficulty ($N = 72$).

Note. Dashed paths are nonsignificant.

* $p < .05$, ** $p < .01$.

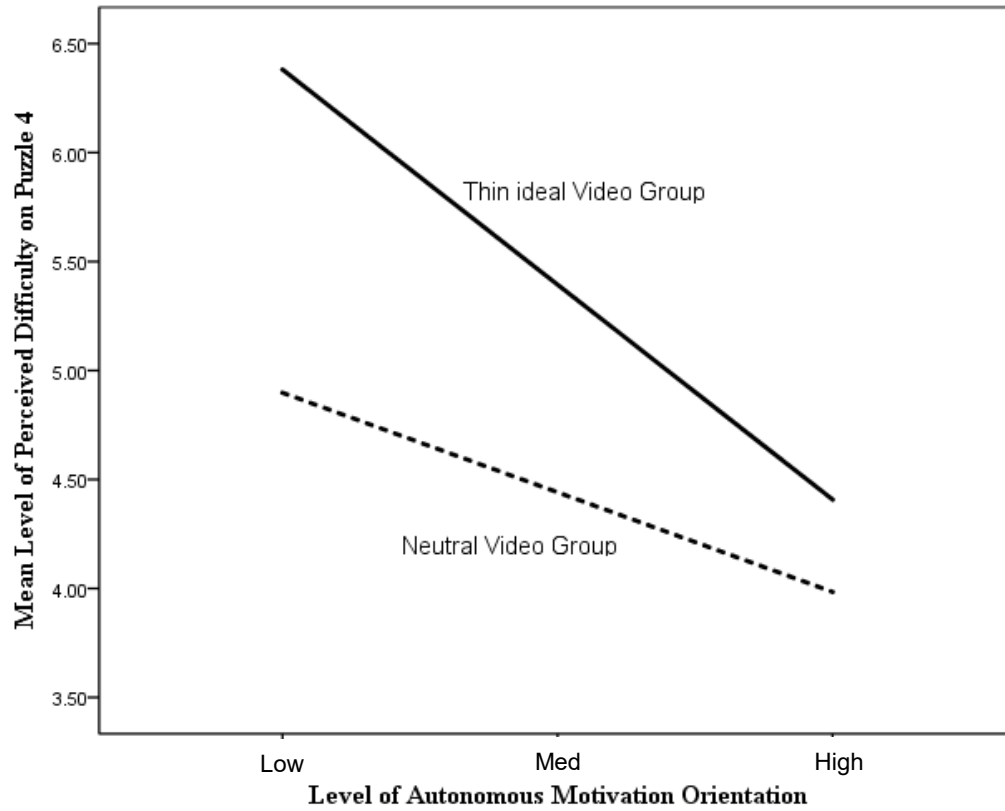


Figure 5. Study 2. The interaction between video condition and autonomous motivation orientation on Puzzle 4 perceived difficulty ($N = 72$).

Supplemental Materials

Table 1

Pearson Correlations and Partial Correlations Matrix among Study 1 Variables of Interest

Control Variable		1	2	3	4
none	1. Video		.26***	-.06	.07
	2. Appearance schema activation			-.36***	-.19**
	3. Autonomous motivation				.40***
	4. Controlled motivation				
Controlled motivation	1. Video		.27***	-.09	
	2. Appearance schema activation			-.32***	
	3. Autonomous motivation				
Autonomous motivation	1. Video		.25**	.10	
	2. Appearance schema activation			-.05	
	3. Controlled motivation				

Note. ** $p < .01$, *** $p < .001$.

Table 2

Study 1 Multiple Moderation Results for the Effect of Video on Appearance Schema Activation by Autonomous and Controlled Motivation Orientation

		Word-Stem Completion		
		Coefficient (SE)	BCa 95% CI	
			LL	UL
Intercept	i_1	6.56*** (.23)	6.10	7.02
Video (X)	b_1	1.46*** (.39)	0.69	2.23
Autonomous (M)	b_2	-0.45 (.26)	-0.98	0.07
Controlled (W)	b_3	0.09 (.23)	-0.36	0.54
Video x Autonomous (XM)	b_4	-1.27** (.48)	-2.22	-0.33
Video x Controlled (XW)	b_5	-0.59 (.38)	-1.35	0.16
$R^2 = .25$				
$F(5, 195) = 11.23, p < .001$				

Note. ** $p < .01$, *** $p < .001$.

BCa = Bias Corrected and Accelerated; CI = Confidence Interval; LL = Lower Limit, UL = Upper Limit. Based on 5000 bootstrap samples.

Table 3

Pearson Correlations and Partial Correlations Matrix among Study 2 Variables of Interest

Control Variable		1	2	3	4	5	6	7
none	1. Video		-.27*	.32**	-.13	-.13	.00	-.03
	2. Puzzle 4 accuracy			-.62***	.21	.24*	.37**	-.13
	3. Puzzle 4 difficulty				-.38**	-.44***	-.45***	-.04
	4. Perceived strength					.72***	.38**	-.05
	5. Physical condition						.39**	-.14
	6. Autonomous motivation							.17
	7. Controlled motivation							
Controlled motivation	1. Video		-.28*	.32**	-.11	-.13	.01	
	2. Puzzle 4 accuracy			-.63***	.18	.24*	.40**	
	3. Puzzle 4 difficulty				-.40**	-.45***	-.45***	
	4. Perceived strength					.72***	.34**	
	5. Physical condition						.39**	
	6. Autonomous motivation							
Autonomous motivation	1. Video		-.29*	.36**	-.11	-.13	-.04	
	2. Puzzle 4 accuracy			-.55***	.08	.14	-.21	
	3. Puzzle 4 difficulty				-.30*	-.34**	.46	
	4. Perceived strength					.69***	-.13	
	5. Physical condition						-.22	
	6. Controlled motivation							

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4

Study 2 Multiple Moderation Results for the Effect of Video on Performance Outcomes by Autonomous and Controlled Motivation Orientation

			Soma Puzzle Accuracy			Perceived Difficulty		
			Coefficient (SE)	BCa 95% CI		Coefficient (SE)	BCa 95% CI	
				LL	UL		LL	UL
Intercept	i_1		1.06* (.44)	.21	1.91	4.44*** (.21)	4.02	4.86
Video (X)	b_1		-1.58** (.60)	-2.76	-.40	0.96** (.30)	0.37	1.54
Auto (M)	b_2		1.50* (.60)	.32	2.68	-0.56** (.21)	-0.98	-0.15
Control (W)	b_3		-.76* (.39)	-1.52	-.01	0.08 (.17)	-0.25	0.41
Video x Auto (XM)	b_4		-.16 (.86)	-1.85	1.54	-0.58* (.29)	-1.16	-0.01
Video x Control (XW)	b_5		.52 (.53)	-.52	1.56	-0.11 (.21)	-0.54	0.32
			Cox-Snell $R^2 = .26, p < .001$			$R^2 = .34$ $F(5, 66) = 13.21, p < .001$		

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

BCa = Bias Corrected and Accelerated; CI = Confidence Interval; LL = Lower Limit, UL = Upper Limit. Based on 5000 bootstrap samples.

GENERAL DISCUSSION

From a developmental perspective, body image is important between adolescence and young adulthood (i.e., between the ages of 15 and 30). During this developmental period, boys experience a number of biological (e.g., changes in hormones, increase in BMI), physical (e.g., growing taller, more chest and facial hair), social (e.g., independence from parents, moving away to college), and psychological changes (e.g., discovering sexuality, identity), all of which impact their self-image (Jones, 2004). Blashill and Wilhelm (2014) noted that, developmentally, adolescence to early adulthood (ages 15 to 29) is a particularly critical life stage because this is typically when mental disorders tend to emerge. Young men are also more likely to experience fluctuations in their perceptions of body image and more generally, self image (Levine & Smolak, 2002). In fact, during late adolescence and early adulthood, the desire to develop muscularity has emerged as an important issue for many men (Fisher, Dunn, & Thompson, 2002; McCreary & Sasse, 2000).

Recently, Mulgrew and Cragg (2017) explored different age groups to determine whether age moderates body image outcomes. The authors found that age indeed predicted more social comparisons and negative self-evaluations for men between 18 and 30 years of age compared to middle aged-men (31 to 55 years) and older men (56 to 77 years). Murray and Lewis (2014) also found that age moderates body dissatisfaction. Specifically, they found that young adult men (17 to 29 years) experience the highest levels of body dissatisfaction compared to middle aged-men (30 to 49 years) and older men (50 to 71 years).

According to a recent meta-analysis of the effects of media body portrayals on adolescent body image, both correlational and experimental studies found that late adolescent men perceive more pressure from the media and express increasingly negative self-images compared to young

adolescent boys (Barlett et al., 2008). Hence, men's body image disturbances sometimes get worse with age over the course of adolescent development (O'Dea & Caputi, 2001). By late adolescence (18 to 20 years) men transitioning into adulthood are quite often experiencing increased body dissatisfaction and drive for muscularity in conformance with the cultural ideal. Given that late adolescence and young adulthood are recognized as critical periods in men's body image research, we directed our efforts to recruit samples of men between 17 and 30 years of age to further explore the effects of media body ideals on men's cognitive health.

The purpose of the current dissertation was, ultimately, to uncover the effects of media body ideals (both the male muscular ideal and female thin ideal) on undergraduate men's cognitive functioning and performance thus contributing to a recognized gap in the literature. Specifically, we aimed to investigate the effects of such media content on men's cognitive functioning using a unique theoretical framework to contribute to this realm of body image research.

The first main research question asked whether exposure to media advertisements portraying the male muscular ideal and/or female thin ideal affects young adult men's cognitive functioning. Given that existing research is primarily in accord and reveals that the muscular ideal has negative effects on various aspects of men's body image, we followed up with a second main research question: how does particular media content exert its effect on men's cognition. We included objectification theory (Fredrickson & Roberts, 1997) to take a closer inspection of the *process* through which the muscular ideal affects some men. The third research question asked for which types of people does media body ideal content exert a stronger or weaker effect on men's cognition. Grounded in self-determination theory (Deci & Ryan, 1985, 2000), we investigated the roles of global motivation orientations (i.e., autonomous and controlled) to take

into account individual differences that might unearth *who* may be more resistant, or more vulnerable, to media portrayals of the male muscular ideal and/or female thin ideal.

To our knowledge, the studies herein are the first to integrate self-determination theory to the study of men's cognitive performance following exposure to media body ideals and, evidently, men's body image in general. Self-determination theory has been applied to a variety of related areas including physical activity (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2009), eating constraint behaviours and disorders (Mask & Blanchard, 2011a; Pelletier et al., 2004), and women's body image (Mask & Blanchard, 2011b; Mask et al., 2014). Results consistently show that an autonomous motivation orientation protects individuals from experiencing unfavourable outcomes such as poorer adherence to physical activity programs, increased vulnerability to eating pathologies, and poorer self-evaluations following exposure to ideal media images.

Given the protective nature of global autonomous motivation, it seems highly salient to empirically test its relationship with men's body image consequences including cognitive performance outcomes in order to consider the relevance of integrating motivational constructs into theoretical models of men's body image. Hence, we employed a self-determination theory framework to test its ground among male undergraduate samples. In addition, this research provided the opportunity to shift perspectives and diverge from the predominantly pathology focused research aimed at understanding negative body image (Tylka, 2011, 2012; Tylka & Wood-Barcalow, 2015) to explore the resilience and protective factors promoting positive body image, thus supporting new advancements in the field. Accordingly, rather than solely investigating the negative effects on body image-related outcomes, we aimed to identify and

assess a potential protective factor to uncover how to foster positive body image and improve cognitive functioning.

Manuscript 1 (M1) focused on the effects of the *muscular* ideal on undergraduate men's cognitive functioning and performance. We assessed objectification theory to investigate whether men self-objectify and, if so, whether self-objectification related to poorer cognitive functioning. M1 included three cross-sectional studies, one survey and two experimental studies, where male university students completed a survey, watched a randomly assigned video (either the muscular ideal or neutral video), and engaged in a cognitive task. M1 examined three hypotheses. First, it was hypothesized that the muscular ideal video would negatively affect men's cognitive performance compared to those in the neutral condition. Second, we tested whether self-objectification would mediate the relationship between video exposure and cognitive performance thereby explaining the process by which the video exerted an effect on viewer's cognition. Third, we hypothesized that an autonomous motivation orientation would protect individuals in the muscular ideal condition from experiencing high levels of self-objectification and in turn, poorer cognitive performance after accounting for controlled motivation orientation. Conversely, a controlled motivation orientation might predict who is more vulnerable to the adverse media effects.

Manuscript 2 (M2) focused on the effects of a *thin* ideal video instead of a muscular ideal video. Given that the literature on the effects of female thin ideal images on men's body image outcomes is underdeveloped, our objective was to contribute to this realm of research by investigating the effects of such media on men's cognitive functioning and self-evaluative measures. According to previous research, the female thin ideal may exert an effect on men's body image through, for example, romantic confidence. Aubrey and Taylor (2009) initially

found that exposure to the female thin ideal increased heterosexual men's body dissatisfaction because participants were reminded that they must conform to strict appearance standards if they wish to pursue similar attractive women. Hence, a decrease in romantic confidence led to more severe self-evaluations among men. Another reason for the effects of the female thin ideal on men's body image is that exposure may have increased psychological or physical arousal. Although this premise has yet to be tested, we nevertheless, explored the effects of such media on men's cognitive functioning and self-evaluations to contribute to this small literature focusing the effects of opposite-sex media ideals.

Overall, M2 included two cross sectional studies, one survey and one experimental study that used a similar design and procedure as M1, though an additional survey was included to measure self-evaluations. M2 examined three hypotheses. First, it was hypothesized that the female thin ideal versus the neutral video would negatively affect men's cognitive functioning and performance. Second, it was hypothesized that the thin ideal video would also predict poorer self-evaluations compared to those in the neutral condition. Third, we hypothesized that a highly autonomous motivation orientation would protect men and therefore predict better cognitive performance and healthier self-evaluations after accounting for controlled motivation compared to men with low autonomous motivation. Conversely, a highly-controlled motivation orientation might predict who is more vulnerable to the adverse effects associated with the thin ideal.

Summary of Findings

Consistent with the overall hypotheses of the thesis, the muscular ideal video (M1) and thin ideal video (M2) had a significant negative effect on men's cognitive functioning and cognitive performance across the two manuscripts. We found that undergraduate men who were subject to the muscular ideal or thin ideal video reported more appearance words on the word-

stem completion task (i.e., increased appearance schema activation), demonstrated poorer visual-spatial performance on the Soma puzzle (i.e., less accuracy on a difficult level and more perceived difficulty), and diminished processing proficiency (i.e., slower reaction times for appearance-related words and colour words) during the Modified Stroop task compared to those in the neutral conditions.

In line with previous research, the findings indicate that exposure to cultural body ideals portrayed in commercial advertisements inadvertently or implicitly affect men's cognitive functioning (e.g., Hargreaves & Tiggemann, 2002; Labarge, Cash, & Brown, 1998; Quinn et al., 2006). For example, in Study 1 (M1) and Study 1 (M2), we evaluated whether specific environmental primes (i.e., media body ideals) would activate appearance schemas. Results from the word-stem completion task demonstrated that although the effects were relatively subtle (averages ranged between 6 and 9 appearance words out of 22 word-stems across all video condition), the participants were not deliberately reporting appearance-related words.

These findings have significant implications for various life outcomes including performance in school, at work, and in sports. According to Musso, Kyndt, Cascallar, and Dochy (2012), working memory, attention, and motivation all directly influence learning and problem-solving capacities. In addition, Bull and Lee (2014) highlight the strong link between cognitive function skills and mathematical achievement in children and youth. Furthermore, research conducted over the last decade has revealed that measures of working memory, inhibition, and set shifting also reliably predict performance in school and might provide more information than traditional testing (like using multiplication and other math equation tests) to assess, for instance, arithmetic learning disabilities (Bull & Lee; 2014). Ultimately, the findings from the current research program shed light on the possible negative consequences of media body ideals on

performance in different life domains. Of particular concern among this population of undergraduate men, is their performance in university. Thus, future research should explore the impact of media body ideals on men's grade point average, scores on assignments and tests, and even their attendance/absenteeism.

In addition, we hypothesized that objectification theory might explain how the muscular ideal video exerted its effect on men's cognitive functioning. Though objectification theory was originally developed to explain body image-related consequences among women, progressively more researchers argue for its application to men (Hebl et al., 2004; Martins et al., 2007; Morrison et al., 2003; Strelan & Hargreaves, 2005; Tiggemann & Kuring, 2004). The media are increasingly objectifying men's bodies (Rolhinger, 2002) and men have more opportunity to adopt an objectified view onto their personal selves thus resulting in self-objectification (Daniel & Bridges, 2010).

Consistent with this premise, we found that men who were primed with the muscular ideal video demonstrated significantly higher levels of self-objectification which in turn, predicted poorer cognitive functioning compared to those in the neutral condition. According to the theory, muscular ideals can elicit self-objectification in men, which is a state of self-monitoring and preoccupation with one's external appearance, that ultimately interferes with attentional processes required for alternative tasks (Quinn et al., 2006). Based on our results, self-objectification is indeed an internal process that can explain, for some men and to some extent, the negative effects of exposure to the muscular ideal on men's subsequent cognitive functioning and processing of information. Future efforts should develop new tools for measuring self-objectification that specifically apply to men in order to expand research and

explore the contribution of *trait* self-objectification among boys and men to help advance theoretical knowledge.

Also in line with the overall hypotheses of the thesis, men who reported a high autonomous motivation orientation were less influenced by the male muscular ideal (M1) and female thin ideal (M2) video compared to men who had low levels of autonomous motivation. In M1, we found that an autonomous motivation orientation played a protective role for men in the muscular ideal condition because men who reported high levels of autonomous motivation in general demonstrated less appearance schema activation, performed better at the difficult Soma puzzle, and performed significantly faster on the Modified Stroop task compared to those who had low levels of autonomous motivation.

Similarly, in M2 we found that autonomous motivation orientation also played a protective role for men who were exposed to the female thin ideal. In general, men in the thin ideal condition who had a high autonomous motivation orientation also demonstrated less appearance schema activation and perceived a challenging Soma puzzle as less difficult compared to men who had a low autonomous motivation orientation. Overall, we found that an autonomous motivation orientation in life could conceivably act as a shield against pressures from media body ideals and hence, reduce the risk of experiencing body image-related apprehensions including diminished cognitive performance.

Future research should further explore the benefits of an autonomous motivation orientation in other areas related to men's body image such as its potential to reduce the risk of eating disorders or body dissatisfaction in men. In fact, the conceptualization that an autonomous motivation predicts more body satisfaction which, in turn, might contribute to the buffering effect on men's cognitive functioning should also be considered in future research. Studies

among samples of women reveal that autonomous motivation is associated with decreased body dissatisfaction (Mask et al., 2014) even following exposure to media body ideals. Hence, the protection of autonomous motivation on body satisfaction might sequentially predict less cognitive impairment. This unique premise should be explored in prospective research to help understand the extent of the benefits of an autonomous motivation orientation and to truly comprehend how the construct shields men from negative body image outcomes.

However, it is important to note that, although an autonomous motivation orientation protects individuals from external influences such as body image cues, this premise should not be associated with the notion that autonomously oriented people are more likely physically fit. According to the present research program, BMI had no relation to autonomous motivation reported by men across all five studies. Therefore, men of all body sizes can experience autonomous motivation in life, which serves as a protective factor against negative emotions, perceptions, and evidently, cognitions.

Moreover, the benefits of an autonomous motivation orientation should also be explored in different populations including younger male populations such as high school boys given that these age groups also experience some body image disturbance. Fostering autonomous motivation in children and youth may help facilitate an autonomous motivation orientation in later years, thereby protecting people from negative body image-related consequences in late adolescence, young adulthood, and ultimately, over the lifespan.

In contrast, dispositional controlled motivation was a nonsignificant moderator across both manuscripts. At large, dispositional controlled motivation had relatively no relation to men's cognitive performance following exposure to media body ideals. Considerable evidence exists which maintains that a controlled motivation orientation has a negative effect on indicators

of well-being and performance (Ryan & Deci, 2000). However, the literature provides increasingly more evidence suggesting that dispositional autonomous motivation is more consistent in predicting who is more vulnerable to, or protected from, various potentially adverse circumstances (Liu et al., 2009; Van den Broeck et al., 2012). Consistent with Koestner et al. (2008), we suggest that individuals ought to focus on enhancing their autonomous motivation orientation in life rather than focus on reducing their controlled motivation in order to protect themselves against the negative effects associated with media body ideals and in particular, to protect their cognitive functioning.

Nevertheless, future research should not exclude the study of controlled motivation orientation because for some, controlled motivation is a strong motivator and predictor of behaviour and emotion, especially according to previous self-determination theory research. Excluding the consideration of a persons controlled motivation orientation may leave out pertinent information in new research. So, although our findings were generally nonsignificant, controlled motivation in different populations might be relevant. We therefore advise future investigations to consider and test the relative importance of controlled motivation in predicting body image outcomes in various contexts and situations to determine its function even if its role is subtle.

By and large, the findings support the notion that not all men respond to media body ideals in the same way nor to the same extent. This is a similar phenomenon repeatedly found in research samples with girls and women throughout the literature (e.g., Mask & Blanchard, 2011a; Want, 2009). Collectively, our findings show that the media's ability to shape men's body image, and more precisely cognitive functioning, is largely in the eye of the beholder rather than in the image itself (Ferguson, 2013). Of course, this does not imply that such media

portrayals are in any way constructive exemplars or suitable standards for society. Rather, the prominent male muscular ideal and female thin ideal portrayed in media advertisements can have detrimental consequences for some men and therefore requires attention and appropriate intervention strategies to help alleviate accompanying body image disturbances.

Limitations and Future Directions

The findings of the current research must be interpreted in light of some limitations which offer fruitful avenues for future research. First, the findings from both M1 and M2 are based on undergraduate students and therefore our interpretation of the findings cannot generalize to other populations such as the general community, men and boys of different ages, and men with diverse educational backgrounds. It would be beneficial for future research to investigate these questions with samples of non-student populations in order to contribute to our understanding of men's body image across the lifespan and various domains.

We deliberately studied undergraduate students because previous research demonstrates that undergraduate men (17 to 30 years) who are exposed to even short-lived media stimuli exhibiting the male muscular ideal or female thin ideal often report feeling worse about their body (e.g., greater muscle dysmorphia) and hold more unrealistic thoughts about their body's shape and size (Lavine et al., 1999; Leit et al., 2002). In addition, some young adult men experience severe preoccupations and body image disturbances (e.g., increased appearance anxiety) following exposure to ideal depictions of beauty (Aubrey & Taylor, 2009; Mulgrew & Cragg, 2017; Spector & Wiss, 2014). Moreover, previous efforts (e.g., Tiggemann et al., 2004) found that female undergraduate students experience more negative effects including poorer cognitive processing after exposure to the thin ideal compared to younger and older samples of women. Lastly, Grippo and Hill (2008) found that self-objectification tends to decrease in

women with age and suspect a similar trend for men. For these reasons, we launched our research in the context of men's body image with samples of undergraduate men because they are undoubtedly susceptible to media body ideals, and thus, an ideal place to begin our investigations related to cognitive health. However, based on the findings, it is highly relevant to expand body image research and the study of cognitive performance to diverse populations of boys and men.

Second, consistent with Mulgrew et al. (2014), we asked participants to be attentive during the video which may have inflated the effects of the video. Previously, Hargreaves and Tiggemann (2002) found that participants in their concentrated viewing condition demonstrated significantly larger effect sizes on body image outcomes compared the distracted viewing condition. Participants in the distractor condition reported less body dissatisfaction, better mood, and less appearance schema activation compared to those in the concentrated viewing condition. Essentially, the distracted viewing condition asked participants to rate each commercial on effectiveness which buffered the negative effects on body image. Similarly, Pope et al. (2000) found that short but concentrated viewing of media body ideals produced the most potent negative effects for both girls and boys body dissatisfaction but not for those who were in the distracted viewing condition. Overall, the literature on media effects (such as exploring the effects of media on violence in children) is well-recognized for its larger effect sizes that accompany more attentive viewing (for a meta-analysis see Hearold, 1996). However, given that we had to respect time constraints and that video exposure was limited to 5 minutes, we favoured attentive viewing to ensure that the video would prime the viewer accordingly. The findings are therefore not necessarily representative of the real world and the effects may not be replicable in natural settings. We strongly advise future research to include a distracting condition to test

different kinds of viewing that might increase the ecological validity without compromising the internal validity of the study.

Third, in order to measure performance on the Soma puzzle task we used two measures, namely, “were you able to solve the puzzle” and “to what extent did you find the puzzle difficult”. The former was a dichotomous variable that required a simple yes or no. Moderation analyses are not ideal for dichotomous outcome variables and cannot provide effect sizes. The latter relied on honest reporting. We suspect that a few participants may have underreported the extent to which they found the puzzles difficult because self-report methods are recognized for biases, particularly when rating performance. Individuals often perceive their competence in self-serving ways which often results in less accurate perceptions. For example, research indicates that people who perform the worst are generally more likely to over-estimate their performance compared to people who perform well (DeAngelis, 2003). Meggison (2016) tested this premise by measuring executive functions with a computerized test that produces accurate scores as well as included a self-report assessment of performance. In general, participants believed they performed better than they really did. Therefore, future measures of cognitive performance that require self-report should either ask more questions about the participants experience or include alternative procedures such as timing the activity (time each puzzle separately) or video recording the activity for additional qualitative data. Prospective research can also employ objective measures of visual-spatial processing such as computer trials that require mentally rotating shapes and figures where the program systematically scores all performance variables.

Fourth, across all studies, there were no baseline measures of cognitive functioning. For example, we did not include a baseline measure for appearance schema prior to video exposure to identify the size of the change before and after the video manipulation. Also, we did not

account for individual differences on trait-level factors such as general assessment of body esteem prior to the video. Our goal was to minimize the possibility of priming effects that might arise when asked about appearance prior to the video manipulation as well as to reduce the prospect of raising participant suspicions about the true purpose of the study. To deal with the absence of baseline measures, we used randomization methods to maintain equal groups at baseline which is considered highly appropriate for between-subject designs (Tabachnick & Fidell, 2001). Prospective research should certainly consider including baseline information prior to the manipulation to effectively compare the before and after variability. Alternatively, future research can include a creative cover story to mask the reason for including baseline measures.

Likewise, we did not include a measure of situational motivation prior to the video. Future research ought to manipulate situational motivation before exposure to the video in order to determine if an individual's state level of autonomous versus controlled motivation at that particular moment is affected by the manipulation. In turn, situational motivation may explain, in part, the effects on cognitive performance. We took a global perspective and measured general motivation orientations but preceding efforts (e.g., Guay, Vallerand, & Blanchard, 2000) have suggested that situational motivation explains performance more accurately at a given moment such as during a controlled lab experiment because it is more dynamic and can change erratically depending on the circumstances (Vallerand, 1997).

Fifth, the documented effects were obtained in response to portrayals of body ideals (both the male muscular ideal and female thin ideal) displayed in advertisements. It is therefore unknown whether the results would generalize to alternative sources of media such as social networking sites like Facebook and Instagram or modern video games with avatar's (characters that are designed by the players that often bear resemblance to the player's idealized self).

Considering all of the media outlets available to boys and men, future research should explore the effects that these different sources have on men's cognitive functioning and cognitive performance. Hence, particular avenues that should be considered for future research are the effects of selfies and images of peers on social networking sites rather than celebrities and models in the mass media since boys and men are often subject to this kind of body image. In fact, boys and men who engage in social networking, online gaming, or virtual reality hubs are exposed to different types of body images. Researchers should therefore consider exploring the impact of various sexualized images on boys and men's health and cognition especially given that technologies and digital applications are developing at a fast rate and the effects of alternative images (including images of peers) are not well understood.

Sixth, the articles in M2 focused on the effects of the female thin ideal on men's body image outcomes without considering the process through which this kind of portrayal might have had an effect on male viewers. The lack of mediation variables in the model essentially limits our knowledge in terms of *how* the female thin ideal might exert an effect on men's cognitive functioning. Given that previous research shows that romantic confidence is a mediating factor that explains the effects of female sexualized images on men's body image, this variable should be included in future research predicting cognitive functioning.

Furthermore, we propose that arousal might have a role in explaining the negative effects on men's body image outcomes because research in the domain of pornography and exercise psychology indicate that general psychological or physical arousal narrows attention. For example, research reveals that female pornographic material causes arousal in men which, in turn, leads to decreased working memory (Laier, Schulte, & Brand, 2013) and poorer spatial ability (Messina, Fuentes, Tavares, Abdo, & Scanavino, 2017). Moreover, although acute

exercise increases a very different kind of physiological arousal, exercise-induced arousal also seems to thwart cognitive performance throughout the period of stimulation (Lambourne & Tomporowski, 2010). We therefore suggest that future studies explore arousal as a means for explaining the effects of the female thin ideal on heterosexual men's cognitive functioning and self-evaluations.

Finally, the indexes computed for autonomous and controlled motivation orientation were consistently positively correlated across all five studies. Although many self-determination theory professionals expect a negative relationship, others have established the same positive association (e.g., Lumb, Beaudry, & Blanchard, 2016). Former self-determination theory research used a one index approach for computing a global motivation orientation score. This index was calculated based on a weighted average across all five categories of motivation regulation (i.e., intrinsic, identified, introjected, extrinsic and amotivation). Individual scores indicated either a more autonomous or more controlled motivation orientation. More recently however, researchers questioned the validity of this method and tend to reject it because the two-index approach allows researchers to maintain information that would otherwise be lost when averaging scores across all motivation regulations (Koestner et al., 2008). Individuals are presumed to have some level of dispositional autonomous motivation and simultaneously some level of dispositional controlled motivation (Deci & Ryan, 2008). Since researchers started using the two-index approach, the two motivational constructs are often found positively associated. To deal with this concern, our analyses were conducted to statistically partial out (partial correlations) and control for (various moderation analyses) one another. Therefore, the results are cautiously interpreted in light of the fact that the two motivation constructs do not overlap even though in life, the constructs are often positively associated and intersect with one another.

Theoretical Implications

The current research merges three literatures, namely, objectification theory, self-determination theory, and men's body image. Consistent with the premise of objectification theory (Fredrickson & Roberts, 1997; Moradi & Huang, 2008), we found that gender specific socializations, such as watching muscular ideal-focused advertisements for a short period, provoked experiences of self-objectification among samples of undergraduate men. Despite that objectification theory proposes that women are more likely than men to internalize persuasive messages from the media, increasingly more studies reveal that this account no longer holds to be true. In line with Hargreaves and Tiggemann (2009) and Strother et al. (2012), our research supports objectification theory as a meaningful theoretical framework for elucidating just how particular sociocultural pressures exert its effect on men's body image-related outcomes. Although disagreement across researchers persist, the investigations herein demonstrate significant findings without solely employing self-report measures, which offers meaningful implications.

Specifically, it is recognized that men conceal their feelings more frequently in body image-related self-report measures (Berger, Levant, McMillan, Kelleher, & Sellers, 2005) compared to women, thus potentially misleading nonsignificant results which advocate the inappropriateness of objectification theory for understanding men's body image. This possible concealment or obscurity may guide misunderstandings and misinterpretations of the male experience. Our research confronts this challenge by approaching the study of objectification theory with an alternative method. We explored the effects of a muscular ideal video on self-objectification using an open-ended questionnaire and in turn, on cognitive functioning (i.e., outcomes that are difficult to obscure). The findings indicated that the muscular ideal portrayed

in advertisements indeed predicted increased experiences of self-objectification. Subsequently, and consistent with theoretical knowledge, self-objectification instigated adverse effects on cognitive functioning (established using primarily objective measures). Overall, in order to further understand the effects of the media on men's body image consequences, the meaning and manifestations of objectification theory constructs ought to be extended to include the male experience.

In addition, self-determination theory constructs were included in the present thesis to shed light on individual differences that could potentially establish more positive body image-related experiences among men. Since global autonomous and controlled motivation orientation are theorized to account for individual differences in a variety of domains including eating pathologies and women's body satisfaction, we examined its application to men's body image outcomes. The results therefore contribute to a growing body of literature which suggests that not all men respond to media in the same manner.

Optimistically, the results were consistent with the premise underlying autonomous motivation which states that the more men approach their daily activities with a sense of autonomy and volition, the more protected they are from persuasive and pervasive sociocultural portrayals of body ideals. Hence, the findings indicated that while some men are more vulnerable to such body ideals, others are more resistant and one factor that helps serve a protective role is by encompassing a global autonomous motivation orientation. In general, given self-determination theory's eudemonic and comprehensive perspective on human motivation and growth, it is relevant to empirically test its relationships with men's body image so that we may consider the significance of integrating motivational constructs into conceptual models that foster positive body image.

Practical and Clinical Implications

Although findings are preliminary in the field, there are potential practical and clinical implications to be considered. First, the thesis aimed to raise public awareness concerning the prevalence of men's body-image disturbance. Men's body image apprehensions and related disorders have been previously overlooked and largely omitted from empirical research and intervention programs. In fact, according to a recent systematic review of all published intervention programs between 1987 and 2007 appointed to foster positive body image and prevent eating disorders on university campuses (Yager & O'Dea, 2008), the majority of programs excluded male students (1 out of 27 intervention programs included male students). The thesis therefore sheds light on the notion that men are vulnerable to cultural body ideals and pressures from the media and ought to be included in future studies and prevention trials. Second, it is our hope that the findings herein provide researchers and counsellors a more thorough understanding of men's body image and body image-related consequences thereby creating and targeting more effective interventions in the near future.

Given that our findings allude to the notion that an autonomous motivation orientation is a protective factor that facilitates improved cognitive functioning following exposure to media body ideals, we suggest that people learn how to promote this kind of motivation. This is especially pertinent for parents and teachers because creating an atmosphere that can help guide the development of an autonomous motivation orientation may assist with improving aspects of body image particularly for those who are vulnerable to external sources of pressure including the media. Parents (Froiland, 2015), teachers (Roth, Assor, Kanat-Maymon, & Kaplan), and coaches (Fenton, Duda, Quested, & Barrett, 2014), for instance, can encourage autonomous motivation by helping individuals feel competent, supported, and autonomous by providing

choices in school, at home, and in sport settings. By ensuring that individuals feel safe and secure in their environment to explore and try new challenges (to master new skills and competencies) and simultaneously, promoting the value of making choices based on what is important to the self, collectively will help foster more autonomous motivation styles.

Furthermore, from a clinical perspective, the research sheds light on motivation characteristics that can be incorporated in clinical programs for boys and men to further prevent or perhaps remedy negative body image (e.g., Kaap-Deeder et al., 2014). For example, therapists and physicians can educate their patients on the different kinds of motivation styles that exist as well as help individuals become more conscious about why they generally engage in different activities. Helping individuals recognize why they are motivated to participate in different behaviours and activities will illuminate more clearly the differences between controlled motivations and autonomous motivations among patients. Fittingly, Kaap-Deeder et al. (2014) found that fostering self-endorsed motivation assisted with behavioural change among patients with an eating disorder. Furthermore, Teixeira et al. (2006) found that increasing autonomous motivations for exercise and eating behaviours among women in a weight loss program generally experienced more weight loss and eventually, more weight control over the duration of the program compared to women who did not endorse autonomous motivations. Therefore, in clinical fields that aim to treat, improve, or prevent negative body image, motivation orientation is an aspect worth considering in order to support desired health outcomes.

Conclusion

In summary, while it was once thought that men were perhaps immune to the potentially detrimental effects of the media on body image, our findings and those of other studies, suggest otherwise (e.g., Oehlhof et al., 2009; Pope et al., 2000). Exposure to advertisements portraying

the muscular ideal can induce self-objectification in susceptible male viewers, and in turn, diminish cognitive functioning and cognition performance on challenging mental tasks. These effects may translate into more interim consequences within daily activities such as the ability to pay attention in various situations (such as in class) or make prompt decisions. Future research is required to advance knowledge and understand both the short-term and more enduring cognitive effects following exposure to the muscular ideal relative to more real-life experiences.

Additionally, exposure to the female thin ideal portrayed in advertisements can also diminish men's cognitive functioning and cognitive performance. Fortunately, consistent with self-determination theory, the results highlighted the beneficial role of an autonomous motivation orientation in protecting men from experiencing such adverse effects instigated by cultural body ideals (i.e., the male muscular ideal and female thin ideal) promoted in the media. Future investigations, prevention strategies, and intervention efforts aimed at reducing or deterring negative body image outcomes among men may benefit from the inclusion of this particular protective factor.

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Appendix A
Recruitment through the Integrated System of Participation in Research (ISPR)

ADVERTISING AND YOUTUBE

How are advertisers reaching men on the largest online video sharing community known as YouTube? What are their characteristics? How do they react to advertisements? This study is designed to answer these questions. The psychology of how male consumers think, feel, and reason can inform marketing campaigns on how they can effectively reach their consumers. Participation in this study consists of attending one laboratory session of approximately 60 minutes in duration.

LA PUBLICITÉ ET YOUTUBE

Comment réussissent les annonceurs à rejoindre les hommes sur le site de partage de vidéos le plus populaire sur l'internet, c'est-à-dire Youtube? Quelles sont leurs caractéristiques et comment réagissent-ils à la publicité? Cette étude vise à répondre à ces questions et s'encadre dans la psychologie de la consommation et du marketing. Les résultats de cette étude pourraient informer les campagnes publicitaires quant à la meilleure façon de capter l'attention des hommes. La participation dans cette étude requiert la présence à une seule séance en laboratoire pour une durée d'environ 60 minutes.

Appendix B

Informed Consent for Studies in Article 1

CONSENT FORM TO PARTICIPATE IN RESEARCH

I am invited to participate in a laboratory experiment entitled “Advertising and YouTube” that is currently being conducted by Dr. Céline Blanchard from the School of Psychology at the University of Ottawa in Ottawa, Ontario and Amanda Baker, PhD student at the University of Ottawa. The project is being conducted for the purpose of Amanda Baker’s PhD thesis, under the supervision of Professor Blanchard. The purpose of this study is to better understand how advertisers are reaching potential consumers on the internet’s most popular video sharing website: YouTube.

My participation in this study will consist of attending this one laboratory session, which will be approximately 60 minutes in duration. During this session, I will be asked to perform a series of tasks: (1) complete a short survey on my general attitudes as well as few demographic questions, (2) watch a 5-minute video comprised of various commercials that were downloaded from YouTube, and (3) complete a short cognitive activity. In agreement with the Integrated System of Participation in Research (ISPR), hosted by the School of Psychology, I will be granted one point for participating in this study.

The risks and inconveniences associated with participating in this study are minimal. However, it is possible that I may experience some discomfort while watching the video and responding to the questionnaire as some images and questions may cause me to think about myself. I have received assurance from the researcher that my participation in this study is entirely voluntary. I am free to withdraw from the experiment at any time without incurring any negative consequences. Should I choose to withdraw, I will still be granted my participation point from the ISPR and the data that I will have provided will be destroyed and thus will not be used for any analyses. Furthermore, I do not have to engage in any behaviors or perform any tasks that make me uncomfortable. In the event that I may experience emotional or psychological discomfort from participating in this study, I may contact the Center for Psychological Services here at the University of Ottawa. Services are provided on a waiting list basis and for a sliding scale fee. Other community resources include the Hopewell Eating Disorder Support Centre and the Regional Centre for the Treatment of Eating Disorders.

My anonymity in this project will be protected. This consent form will be kept in a separate box from the questionnaires that I will be asked to complete during the study. The questionnaires will be identified by my unique number code that I use for participating in studies hosted by the ISPR. I am not required to provide my name nor any personal contact information. I have also been assured that the information that I provide will be kept strictly confidential. The data collected from this study will be stored in a locked cabinet Dr. Céline Blanchard’s laboratory for a period of 5 years following publication after which time they will be destroyed in a secure manner (e.g., shredded and deleted electronically). I have been informed that only the researchers will have access to the data whether it is the original questionnaires or the electronic data file that will be stored on a password-protected computer in the researcher’s laboratory. I am aware that the results obtained from this project are for research purposes only and dissemination of the results in scientific journals will be limited to group responses rather than individual ones.

I, _____, agree to participate in the study entitled “Advertising and YouTube”, conducted by Dr. Céline Blanchard and Amanda Baker. I understand that by accepting to participate in this study, I am in no way waiving my right to withdraw from the study.

If I have any questions about the study, or if I would like to receive a report of the results when they come available, I may contact Dr. Céline Blanchard or Amanda Baker directly by phone or by email.

If I have any ethical concerns regarding my participation in this study, I may contact the Protocol Officer for Ethics in Research at the University of Ottawa.

Signature: _____

Date: _____

Consentement Informé

FORMULAIRE DE CONSENTEMENT POUR LA PARTICIPATION A UNE RECHERCHE

Je suis invitée à participer à une étude en laboratoire intitulée « La publicité et YouTube », qui est présentement en cours sous la supervision du Dr. Céline Blanchard de l'École de psychologie de l'Université d'Ottawa situé à Ottawa en Ontario et du Amanda Baker du département de psychologie de l'Université d'Ottawa. Le projet est mené dans le cadre de la thèse de Doctorat d'Amanda Baker, sous la supervision de Dr Blanchard. Cette étude a comme but de mieux comprendre comment les annonceurs tentent de rejoindre les consommateurs sur le site de partage de vidéos le plus populaire sur l'internet, c'est-à-dire, YouTube.

Ma participation dans cette étude requiert ma présence à une seule séance en laboratoire pour une durée d'environ 60 minutes. Durant cette séance, on me demandera d'effectuer la série de tâches suivantes: (1) compléter un sondage qui porte sur mes attitudes, mes perceptions et mes croyances en générale ainsi que quelques questions démographiques, (2) visionner un court vidéo (5 minutes) qui comprend une série d'annonces publicitaires qui ont été téléchargées de YouTube, et (3) compléter une tâche. En accord avec le Système intégré de participation à la recherche (SIPR) de l'École de psychologie, on m'accordera un point de participation à cette étude.

Les risques et inconvénients associés à la participation à cette étude sont minimes. Cependant, il est possible que j'éprouve de l'inconfort psychologique et/ou émotionnel en visionnant le vidéo et en complétant les questionnaires car certaines images et questions peuvent m'inciter à réfléchir sur ma personne. Je comprends que ma participation à cette étude est entièrement volontaire. Je suis libre de me retirer de l'étude en tout temps sans encourir aucune conséquence négative. Si je décide de me retirer de l'étude une fois l'avoir débutée, on m'accordera tout de même mon point de participation du SIPR et les données que j'aurai fournies seront immédiatement détruites et ne seront pas analysés. De plus, je ne suis pas obligé de m'engager dans des tâches et/ou des comportements pour lesquels je ne suis pas à l'aise. Dans l'éventualité que je ressente de l'inconfort lors de cette étude, je peux communiquer avec le Centre des services psychologiques de l'Université d'Ottawa. Les services sont offerts sur la base d'une liste d'attente et à un tarif variable. Ou sinon avec l'une des ressources suivantes: le centre de soutien des troubles alimentaire Hopewell ou le Centre régional de traitement des troubles de l'alimentation.

Les chercheurs m'ont assuré que mon anonymat sera respecté. Premièrement, ce formulaire de consentement sera mis dans une boîte à part des questionnaires qu'on me demandera de compléter durant l'étude. Deuxièmement, les questionnaires seront identifiés par le code numérique que j'utilise pour m'inscrire aux études du SIPR. Je ne suis pas obligé de fournir mon nom ni d'autres informations personnelles sur les questionnaires. On m'a également assuré que les données que j'aurai fournies par le biais des questionnaires demeureront confidentielles. Les questionnaires et données recueillies seront conservés dans une armoire verrouillée dans le laboratoire de recherche du Dr. Céline Blanchard jusqu'à la fin de l'étude et ce pour une période de 5 ans suivant la publication. Par la suite, elles seront détruites de façon sécuritaire (par exemple, déchiquetées ou supprimées électroniquement). Seuls les chercheurs responsables de l'étude auront accès aux questionnaires ainsi qu'au fichier de données électronique qui sera conservée sur un ordinateur protégé avec un mot de passe qui se retrouve dans le laboratoire de la chercheuse. On m'a informé que les résultats de cette étude seront utilisés uniquement à des fins de recherche et seront publiés dans des périodiques scientifiques sous forme de moyennes de groupe, plutôt qu'individuelle.

Je, _____, consens librement et volontairement à participer à l'étude intitulée « La publicité et YouTube », mené par Dr. Céline Blanchard et Amanda Baker. Je comprends qu'en acceptant de participer à cette étude, je ne renonce pas à mon droit de me retirer de l'étude.

Si je désire obtenir plus de renseignements sur cette étude ou si j'aimerais recevoir un rapport des résultats de l'étude lorsqu'ils seront disponibles, je peux communiquer avec Dr. Céline Blanchard ou avec Amanda Baker par téléphone ou par courriel.

Par contre pour toute question déontologique, je peux communiquer avec la responsable de déontologie en recherche de l'Université d'Ottawa.

Signature: _____

Date: _____

Appendix C

Informed Consent for Studies in Article 2

CONSENT FORM TO PARTICIPATE IN RESEARCH

I am invited to participate in a laboratory experiment entitled “Advertising and YouTube” that is currently being conducted by Dr. Céline Blanchard from the School of Psychology of the University of Ottawa in Ottawa, Ontario and Amanda Baker, PhD student at the University of Ottawa. The purpose of this study is to better understand how advertisers are reaching potential consumers on the internet’s most popular video sharing website: YouTube.

My participation in this study will consist of attending this one laboratory session, which will be approximately 45 minutes in duration. During this session, I will be asked to perform a series of tasks: (1) complete a short survey on my general attitudes as well as few demographic questions (2) watch a 5-minute video comprised of various commercials that were downloaded from YouTube (3) engage in a short cognitive task and (4) complete a short survey on the advertisements in the video, my thoughts and feelings, and general questions about myself. In agreement with the Integrated System of Participation in Research (ISPR), hosted by the School of Psychology, I will be granted one point for participating in this study.

The risks and inconveniences associated with participating in this study are minimal. However, it is possible that I may experience some discomfort while watching the video and responding to the questionnaire. However, I have received assurance from the researcher that my participation in this study is entirely voluntary. I am free to withdraw from the experiment at any time without incurring any negative consequences. Should I choose to withdraw, I will still be granted my participation point from the ISPR and the data that I will have provided will be destroyed and thus will not be used for any analyses. Furthermore, I do not have to engage in any behaviors or perform any tasks that make me uncomfortable. In the event that I may experience emotional or psychological discomfort from participating in this study, I may contact the Center for Psychological Services here at the University of Ottawa. Services are provided on a waiting list basis and for a sliding scale fee. Other community resources include: the Hopewell Eating Disorder Support Centre, and the Regional Centre for the Treatment of Eating Disorders.

My anonymity in this project will be protected. This consent form will be kept in a separate box from the questionnaires that I will be asked to complete during the study. The questionnaires will be identified by my unique number code that I use for participating in studies hosted by the ISPR. I am not required to provide my name nor any personal contact information. I have also been assured that the information that I provide will be kept strictly confidential. The data collected from this study will be stored in a locked cabinet Dr. Céline Blanchard’s laboratory for a period of 5 years following publication after which time they will be destroyed in a secure manner (e.g., shredded and deleted electronically). I have been informed that only the researchers will have access to the data whether it is the original questionnaires or the electronic data file, which will be stored on a password-protected computer in the researcher’s laboratory. I am aware that the results obtained from this project are for research purposes only and dissemination of the results in scientific journals will be limited to group responses rather than individual ones.

I, _____, agree to participate in the study entitled “Advertising and YouTube”, conducted by Dr. Céline Blanchard and Amanda Baker. I understand that by accepting to participate in this study, I am in no way waiving my right to withdraw from the study.

If I have any questions about the study, or if I would like to receive a report of the results when they come available, I may contact Dr. Céline Blanchard or Amanda Baker by phone or by email.

If I have any ethical concerns regarding my participation in this study, I may contact the Protocol Officer for Ethics in Research at the University of Ottawa.

Participant’s signature: _____

Date: _____

Researcher’s signature: _____

Consentement Informé

FORMULAIRE DE CONSENTEMENT POUR LA PARTICIPATION A UNE RECHERCHE

Je suis invitée à participer à une étude en laboratoire intitulée « La publicité et YouTube », qui est présentement en cours sous la supervision Dr. Céline Blanchard de l'École de psychologie de l'Université d'Ottawa situé à Ottawa en Ontario et du Amanda Baker du département de psychologie du l'Université d'Ottawa. Cette étude a comme but de mieux comprendre comment les annonceurs tentent de rejoindre les consommateurs sur le site de partage de vidéos le plus populaire sur l'internet, c'est-à-dire, YouTube.

Ma participation dans cette étude requiert ma présence à une seule séance en laboratoire pour une durée d'environ 45 minutes. Durant cette séance, on me demandera d'effectuer la série de tâches suivantes: (1) compléter un sondage qui porte sur mes attitudes en générale ainsi que quelques questions démographiques (2) visionner un court vidéo (5 minutes) qui comprend une série d'annonces publicitaires qui ont été téléchargées de YouTube (3) compléter une tâche et (4) compléter un questionnaire en anglais qui porte sur le contenu du vidéo, mes pensées et mes sentiments ainsi que quelques questions générales sur ma personne. En accord avec le Système intégré de participation à la recherche (SIPR) de l'École de psychologie, on m'accordera un point de participation à cette étude.

Les risques et inconvénients associés à la participation à cette étude sont minimes. Cependant, il est possible que j'éprouve de l'inconfort psychologique et/ou émotionnel en visionnant le vidéo et en complétant les questionnaires. Cependant, je comprends que ma participation à cette étude est entièrement volontaire. Je suis libre de me retirer de l'étude en tout temps sans encourir aucune conséquence négative. Si je décide de me retirer de l'étude une fois l'avoir débutée, on m'accordera tout de même mon point de participation du SIPR et les données que j'aurai fournies seront immédiatement détruites et ne seront pas analysés. De plus, je ne suis pas obligé de m'engager dans des tâches et/ou des comportements pour lesquels je ne suis pas à l'aise. Dans l'éventualité que je ressente de l'inconfort lors de cette étude, je peux communiquer avec le Centre des services psychologiques de l'Université d'Ottawa. Les services sont offerts sur la base d'une liste d'attente et à un tarif variable. Ou sinon avec l'une des ressources suivantes: le centre de soutien des troubles alimentaire Hopewell ou le Centre régional de traitement des troubles de l'alimentation.

Les chercheurs m'ont assuré que mon anonymat sera respecté. Premièrement, ce formulaire de consentement sera mis dans une boîte à part des questionnaires qu'on me demandera de compléter durant l'étude. Deuxièmement, les questionnaires seront identifiés par le code numérique que j'utilise pour m'inscrire aux études du SIPR. Je ne suis pas obligé de fournir mon nom ni d'autres informations personnelles sur les questionnaires. On m'a également assuré que les données que j'aurai fournies par le biais des questionnaires demeureront confidentielles. Les questionnaires et données recueillies seront conservés dans une armoire verrouillée dans le laboratoire de recherche du Dr. Céline Blanchard jusqu'à la fin de l'étude et ce pour une période de 5 ans suivant la publication. Par la suite, elles seront détruites de façon sécuritaire (p.ex., déchiquetées ou supprimées électroniquement). Seuls les chercheurs responsables de l'étude auront accès aux questionnaires ainsi qu'au fichier de données électronique qui sera conservée sur un ordinateur protégé avec un mot de passe qui se retrouve dans le laboratoire de la chercheuse. On m'a informé que les résultats de cette étude seront utilisés uniquement à des fins de recherche et seront publiés dans des périodiques scientifiques sous forme de moyennes de groupe, plutôt qu'individuelle.

Je, _____, consens librement et volontairement à participer à l'étude intitulée « La publicité et YouTube », mené par Dr. Céline Blanchard et Amanda Baker. Je comprends qu'en acceptant de participer à cette étude, je ne renonce pas à mon droit de me retirer de l'étude.

Si je désire obtenir plus de renseignements sur cette étude ou si j'aimerais recevoir un rapport des résultats de l'étude lorsqu'ils seront disponibles, je peux communiquer avec Dr. Céline Blanchard ou avec Amanda Baker par téléphone ou par courriel.

Par contre pour toute question déontologique, je peux communiquer avec la responsable de déontologie en recherche de l'Université d'Ottawa.

Signature du participant: _____

Date: _____

Signature des chercheuses: _____

Appendix D
Cover Story Items (Article 1 and Article 2)

Please complete the following questions based on your YouTube usage and opinions.

Do you visit the YouTube website? Yes _____ No _____

To what extent do you agree with each of the following items?

Do not agree at all			Moderately agree			Strongly agree
1	2	3	4	5	6	7

Connecting to YouTube is one of my main daily activities.	1	2	3	4	5	6	7
Whenever I'm unable to go on YouTube, I really miss it.	1	2	3	4	5	6	7
Going on YouTube is very important in my life.	1	2	3	4	5	6	7
I could easily do without going on YouTube or watching YouTube videos for several days.	1	2	3	4	5	6	7
I would feel lost without YouTube.	1	2	3	4	5	6	7
The YouTube website is responsive.	1	2	3	4	5	6	7
YouTube is easy to use and navigate.	1	2	3	4	5	6	7
The features on YouTube are adequate for my use.	1	2	3	4	5	6	7
Videos available on YouTube are sufficient for my needs.	1	2	3	4	5	6	7
The YouTube website is responsive.	1	2	3	4	5	6	7

Please check off the categories of videos that you like to watch on YouTube:

Music/TV shows/Film _____	Women's Sports _____
Men sports _____	User-created videos _____
People and Blogs _____	News/ _____
	Politics/Activism _____
Spiritual/ Religious _____	Comedy/Funny videos _____
Education/Informative _____	Cute babies/Animals _____

How many hours do you spend on YouTube per day? _____ per week: _____

Do you have a YouTube account? Yes _____ No _____

Do you upload videos on your YouTube account? Yes _____ No _____

Do you frequently encounter advertisements on YouTube? Yes _____ No _____

Do you pay attention to advertisements on YouTube? Yes _____ No _____

Have you visited a company's website because of an advertisement you saw on YouTube?

Yes _____ No _____

Appendix E
Demographics (Article 1 and Article 2)

Please answer the following demographic questions.

Age: _____

Mother tongue:

French

English

Other: _____

Sexual orientation:

Heterosexual Gay Bisexual Other: _____

Relationship status:

Married Engaged In a relationship Dating Single

Other: _____

Please indicate your ethnicity: _____

Height (feet and inches): _____

Weight (pounds): _____

Appendix F
Global Motivation Scale (Article 1 and Article 2)

General Attitudes

Please indicate to what extent each of the following statements corresponds generally to the reasons why you do different things.

Does not correspond to my reasons at all			Moderately Corresponds to my reasons			Corresponds exactly to my reasons
1	2	3	4	5	6	7

In general, I do things...

1. ... in order to feel pleasant emotions.	1	2	3	4	5	6	7
2. ... because I do not want to disappoint certain people.	1	2	3	4	5	6	7
3. ... in order to help myself become the person I aim to be.	1	2	3	4	5	6	7
4. ... because I like making interesting discoveries.	1	2	3	4	5	6	7
5. ... because I would beat myself up for not doing them.	1	2	3	4	5	6	7
6. ... because of the pleasure I feel as I become more and more skilled.	1	2	3	4	5	6	7
7. ... although I do not see the benefit in what I am doing.	1	2	3	4	5	6	7
8. ... because of the sense of well-being I feel while I am doing them.	1	2	3	4	5	6	7
9. ... because I want to be viewed more positively by certain people.	1	2	3	4	5	6	7
10. ... because I chose them as means to attain my objectives.	1	2	3	4	5	6	7
11. ... for the pleasure of acquiring new knowledge.	1	2	3	4	5	6	7
12. ... because otherwise I would feel guilty for not doing them.	1	2	3	4	5	6	7
13. ... for the pleasure I feel mastering what I am doing.	1	2	3	4	5	6	7
14. ... although it does not make a difference whether I do them or not.	1	2	3	4	5	6	7
15. ... for the pleasant sensations I feel while I am doing them.	1	2	3	4	5	6	7
16. ... in order to show others what I am capable of.	1	2	3	4	5	6	7
17. ... because I chose them in order to attain what I desire.	1	2	3	4	5	6	7
18. ... for the pleasure of learning new, interesting things.	1	2	3	4	5	6	7
19. ... because I force myself to do them.	1	2	3	4	5	6	7
20. ... because of the satisfaction I feel in trying to excel in what I do.	1	2	3	4	5	6	7
21. ... even though I do not have a good reason for doing them.	1	2	3	4	5	6	7
22. ... for the enjoyable feelings I experience.	1	2	3	4	5	6	7
23. ... in order to attain prestige.	1	2	3	4	5	6	7
24. ... because I choose to invest myself in what is important to me.	1	2	3	4	5	6	7
25. ... for the pleasure of learning different interesting facts.	1	2	3	4	5	6	7
26. ... because I would feel bad if I do not do them.	1	2	3	4	5	6	7
27. ... because of the pleasure I feel outdoing myself.	1	2	3	4	5	6	7
28. ... even though I believe they are not worth the trouble.	1	2	3	4	5	6	7

Appendix G
COGNITIVE TASK (Article 1 - Study 1 and Article 2 - Study 1)

WORD-STEM COMPLETION TASK

Please complete the following word-stems with any word that comes to your mind first.

For example:

EXA _____ --> EXAmple or EXAmination or EXA...

FRE _____ --> FREeze or FREe or FRE...

1. CAL
2. BIN
3. SCA
4. DIE
5. THI
6. PLU
7. SLI
8. HAN
9. GRO
10. OBE
11. CHE
12. MUS
13. CEL
14. WAI
15. ABD
16. EXE
17. LEA
18. WEI
19. GRE
20. HEA
21. LIF
22. PRE

Appendix H
COGNITIVE TASK (Article 1 - Study 2 and Article 2 - Study 2)

SOMA PUZZLE TASK

For each puzzle, please answer the following questions.

For question #3 (perceived difficulty), please use the following scale:

Not at all difficult			Moderately difficult			Extremely difficult
1	2	3	4	5	6	7

Puzzle 1

- 1) Please estimate how much time you spent trying to solve puzzle 1. ____ minutes
- 2) Were you able to solve puzzle 1? YES NO
- 3) To what extent did you find it difficult to solve puzzle 1? 1 2 3 4 5 6 7

Puzzle 2

- 1) Please estimate how much time you spent trying to solve puzzle 2. ____ minutes
- 2) Were you able to solve puzzle 2? YES NO
- 3) To what extent did you find it difficult to solve puzzle 2? 1 2 3 4 5 6 7

Puzzle 3

- 1) Please estimate how much time you spent trying to solve puzzle 3. ____ minutes
- 2) Were you able to solve puzzle 3? YES NO
- 3) To what extent did you find it difficult to solve puzzle 3? 1 2 3 4 5 6 7

Puzzle 4

- 1) Please estimate how much time you spent trying to solve puzzle 4. ____ minutes
- 2) Were you able to solve puzzle 4? YES NO
- 3) To what extent did you find it difficult to solve puzzle 4? 1 2 3 4 5 6 7

Puzzle 5

- 1) Please estimate how much time you spent trying to solve puzzle 5. ____ minutes
- 2) Were you able to solve puzzle 5? YES NO
- 3) To what extent did you find it difficult to solve puzzle 5? 1 2 3 4 5 6 7

All puzzles

How many puzzles did you try to solve? ____ puzzles

How many puzzles were you able to solve? ____ puzzles

Appendix I
COGNITIVE TASK (Article 1 - Study 3)

MODIFIED STROOP TASK

Press the key that corresponds to the colour of the font a word is displayed in.

For example, if a word appears in red, press the red key.

Please respond as quickly as possible.

Appearance words	Neutral words	Colour words
BELLY	BUFFALO	BLUE
CHUBBY	CAT	YELLOW
FAT	COWS	GREEN
FLABBY	DUCK	RED
CHEST	GREYHOUNDS	
OVERWEIGHT	RABBIT	
OBESE	RHINOS	
MUSCULAR	SEAGULL	
SLIM	SWANS	
STOMACH	TIGER	
THIGH	WALRUS	
WEIGHT	SHEDDING	
SHAPE	WEEK	
BODY	RENT	
DIET	DISTANT	
UGLY	SWITCH	
BICEP	LEARN	
ABDOMEN	FANS	
STRONG	TOPIC	
BUTTOCKS	BENCH	

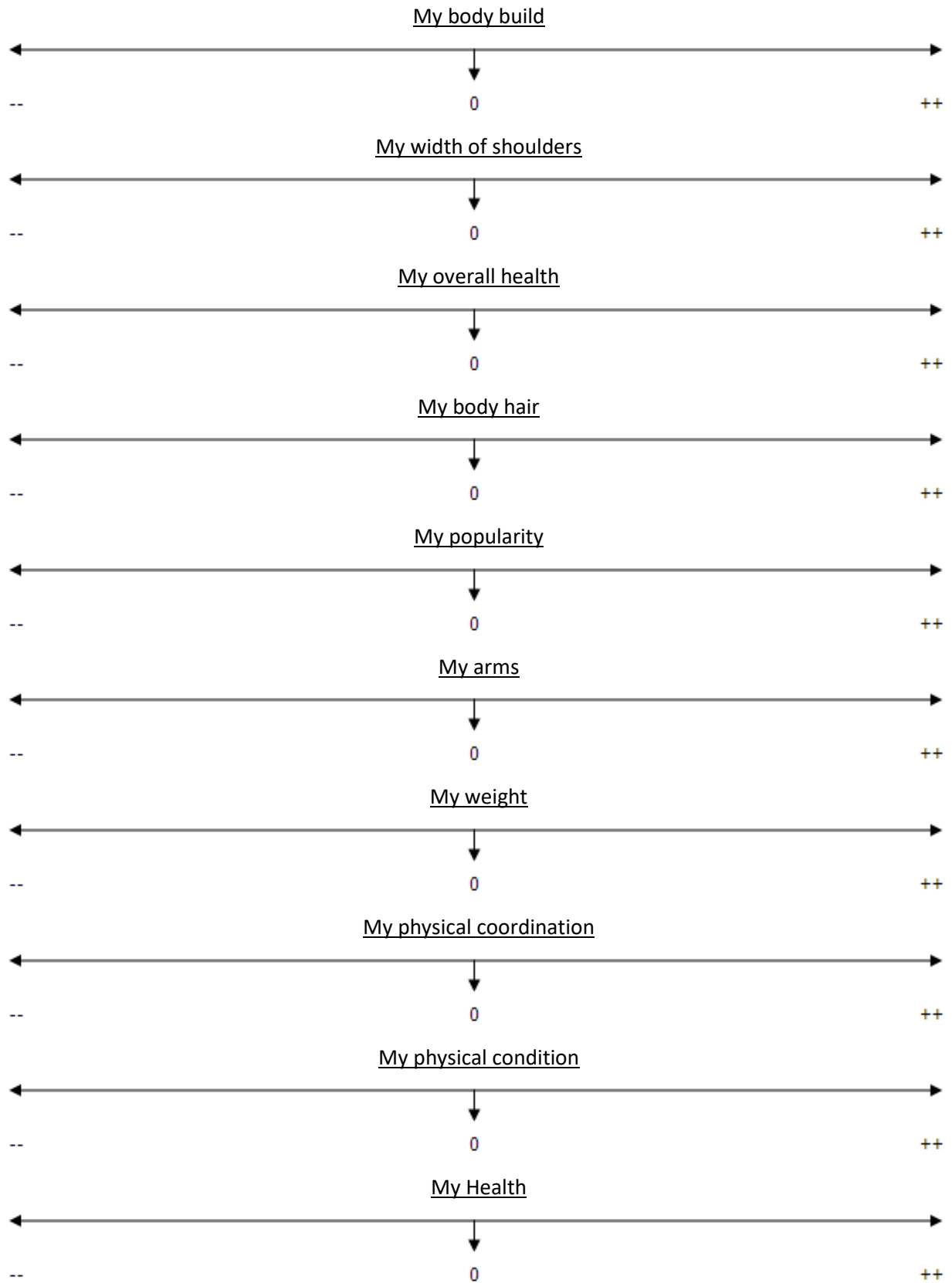
[illegible]

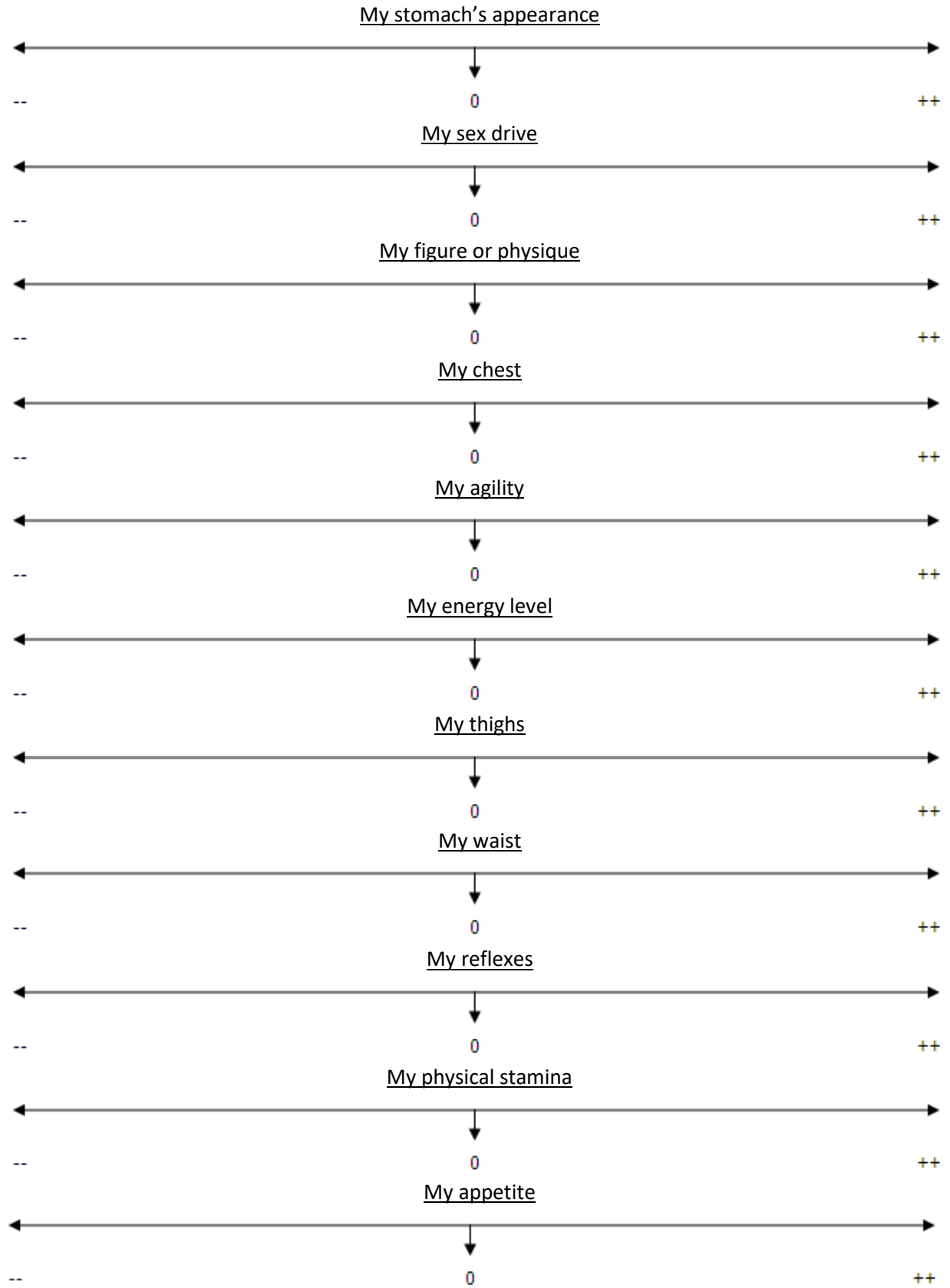
Appendix K
Men's Body Esteem Scale (Article 2 – Study 2)

Attitudes and Feelings

Please indicate how you feel towards each item mentioned below by making a tick / on the horizontal line. The left end of each line is marked by “extreme negative feelings” while the right end of each line is marked by “extreme positive feelings”. The middle point is marked by “no feelings either way”. Note that some items refer to the ads you just viewed, while others refer to general aspects of yourself.

<u>Pedigree dog food</u>		
		
--	0	++
<u>My attractiveness</u>		
		
--	0	++
<u>My muscular strength</u>		
		
--	0	++
<u>My future career</u>		
		
--	0	++
<u>Bentley cars</u>		
		
--	0	++
<u>My school performance (GPA)</u>		
		
--	0	++
<u>My biceps</u>		
		
--	0	++
<u>Arm and Hammer Ultra Last</u>		
		
--	0	++





Appendix L Debriefing Form for Studies in Article 1

DEBRIEFING FORM

You were told that the purpose of the study was to better understand how advertisers are reaching the world's largest online communities, YouTube. However, the real purpose of this study was to examine the impact of advertising on body image and cognitive performance. In order to test this hypothesis, we created two videos for this experiment: a video that showcased the appearance-based attributes of men's bodies (e.g., stomach, chest, legs) and emphasized the importance of having an appealing physique, and a neutral video that featured ads of various products with minimal images of humans. You were randomly assigned to view one of these two videos. The questionnaire you completed *before* watching the video was to measure personal characteristics that may explain individual differences in people's reactions to these different types of media images.

After the video, you were asked to complete a cognitive exercise. This was to measure your performance on a relatively challenging task. We wanted to see if different media images of men would affect how men perceived a subsequent task that involved thinking and persistence as well as determine if specific media images affect men's preoccupations. These deceptions were necessary so that you would not be aware of the real purpose of our study. If you had been aware of the study's real purpose it may have influenced your performance. Given that deception was used in this study, we invite you to re-consent by indicating whether or not we may use your data for this study. Rest assured that if you choose to withdraw your data from the study, you will not incur any negative consequences and thus will still be granted your participation point from the Integrated System of Participation in Research (ISPR), hosted by the School of Psychology.

☐ Yes, I consent to having my data used for this study
☐ No, I do not consent and do not want my data to be used for this study

This study is important for two reasons. First, there is very little research conducted on the effects of exposure to idealized media images on men's cognition. Second, there is also very little research conducted on individual differences that may explain why some men may be more affected by such idealized images than others.

If you felt any discomfort during the experiment or wish to further discuss any health preoccupations you may have, you may contact one of the following resources:

- Center for Psychological Services
- The Hopewell Eating Disorder Support Centre
- The Regional Centre for the Treatment of Eating Disorders

If you have any ethical concerns regarding your participation in this study, you may contact the Protocol Officer for Ethics in Research at the University of Ottawa.

Finally, we would kindly like to inform you that it is extremely important that you do not reveal the purpose of this study, what you did while you were here or any other detail about the research to anyone. Doing so could bias the results of the study and lead to erroneous findings.

In closing, we would like to thank you for participating in this study. Please sign your name below to indicate that you have read this explanation and agree not to discuss this experiment with anyone.

Signature: _____

Date: _____

Débriefing

FORMULAIRE DE COMPTE-RENDU

On vous a informé que le but de l'étude était de mieux comprendre comment les annonceurs tentent de rejoindre les consommateurs sur le site de partage de vidéos le plus populaire sur l'internet, c'est-à-dire YouTube. Par contre, le véritable objectif de cette est d'examiner l'impact de la publicité sur ce que nous pensons et la performance cognitive. Afin de vérifier cette hypothèse, nous avons créé deux vidéos pour cette étude : un premier vidéo qui construit le corps de l'homme comme objet ; ici les attributs liés à l'apparence physiques sont mis en valeur (c'est-à-dire les l'estomac, la poitrine, les jambes, etc...), et finalement un deuxième vidéo de contenu neutre qui comporte des annonces de divers produits sans modèles. Vous avez été attribués de façon aléatoire à visionner l'un de ces deux vidéos. Le questionnaire que vous avez complété *avant* le visionnement tenta de mesurer des différences individuelles importantes qui peuvent expliquer pourquoi certaines personnes sont plus influencer par ce type d'images dans les médias alors que d'autres le sont moins.

Suite à la présentation du vidéo, on vous a demandé de compléter un exercice cognitif. Il s'agissait de mesurer votre performance sur une tâche relativement difficile. Nous voulions déterminer si différentes images médiatisées de l'homme auraient une incidence sur la façon dont les hommes perçoivent une tâche ultérieure qui demande de la réflexion et de la persévérance ainsi que déterminer si certaines images spécifiques des médias affectent les cognitions des hommes. Ces tromperies ont été nécessaires afin que le véritable but de notre étude demeure inconnu des participants. Si vous aviez été au courant du but réel de l'étude, vos réponses auraient pu être biaisées. Étant donné que la déception a été utilisée dans cette étude, nous vous invitons à renouveler votre consentement en nous indiquant si oui ou non nous pouvons utiliser vos données pour notre étude. Soyez assurés que si vous choisissez de retirer vos données de l'étude, vous n'encourez aucune conséquence négative et votre point de participation lié à la recherche vous sera toujours accordé selon le Système intégré de participation à la recherche (SIPR) de l'École de psychologie.

_____ Oui, je consens et j'accepte que mes données soient utilisées pour cette étude
 _____ Non, n'autorise pas à ce que mes données soient utilisées pour cette étude

Cette recherche est importante pour deux raisons. Tout d'abord, il y a très peu d'études qui se sont penchés sur le rôle des images médiatisées de l'homme sur l'image corporelle de l'homme et l'impact sur la cognition. Deuxièmement, il y a aussi très peu d'études qui ont tenté d'examiner pourquoi certains hommes sont plus influencés que d'autres par ce type d'images.

Si vous avez ressenti un malaise pendant l'expérience ou si vous souhaitez discuter davantage de vos préoccupations de santé, vous pouvez communiquer avec l'une des ressources suivantes :

- Le centre des services psychologiques
- Le centre de soutien des troubles alimentaire Hopewell
- Le Centre régional de traitement des troubles de l'alimentation

Par contre si vous avez des questions d'ordre déontologique, vous pouvez communiquer avec la responsable d'éthique en recherche de l'Université d'Ottawa.

Enfin, nous aimerions souligner qu'il est important de ne pas divulguer aucune information au sujet de cette étude incluant le but réel de l'étude et ce que vous avez fait durant l'expérience. Cela pourrait fausser les résultats de l'étude et mener à des conclusions erronées.

En terminant, nous tenons à vous remercier d'avoir participé à cette étude. S'il vous plaît signer votre nom ci-dessous pour indiquer que vous avez lu cette explication et acceptez de ne pas discuter de cette expérience.

Signature: _____

Date: _____

Appendix M Debriefing Form for Studies in Article 2

DEBRIEFING FORM

You were told that the purpose of the study was to better understand how advertisers are reaching the world's largest online communities, YouTube. However, the real purpose of this study was to examine the impact of advertising on how we think and feel toward our bodies and our cognition. More specifically, we expect that different representations of women in the media will have different effects on how men feel toward their own bodies and how they perform on cognitive tasks. In order to test this hypothesis, we created two videos for this experiment: a video that displayed the appearance-based attributes of women's bodies (e.g., stomach, chest, and legs) and emphasized the importance of having an appealing physique, and a neutral video that featured ads of various products with minimal images of humans. You were randomly assigned to view one of these two videos. The questionnaire you completed *after* watching the video was to examine positive and negative feelings that you may have toward your own body as a result of watching the video while the questionnaire you completed *before* watching the video was to measure personal characteristics that may explain individual differences in people's reactions to these different types of media images.

After the video, you were asked to complete a cognitive task and questionnaire. The task was used to measure your performance after watching the video. The questionnaire was used to measure your true feelings and perceptions of yourself. These deceptions were necessary so that you would not be aware of the real purpose of our study. If you had been aware of the study's real purpose it may have prevented you from giving us unbiased responses. Given that deception was used in this study, we invite you to re-consent by indicating whether or not we may use your data for this study. Rest assured that if you choose to withdraw your data from the study, you will not incur any negative consequences and thus will still be granted your participation point from the Integrated System of Participation in Research (ISPR), hosted by the School of Psychology.

☐ Yes, I consent to having my data used for this study
☐ No, I do not consent and do not want my data to be used for this study

This study is important for two reasons. First, there is very little research conducted on the effects of exposure to idealized media images of women on how men feel toward their own bodies and how it may impact cognition. Second, there is also very little research conducted on individual differences that may explain why some men may be more affected by such idealized images than others.

If you felt any discomfort during the experiment or wish to further discuss any health preoccupations you may have, you may contact one of the following resources:

- Center for Psychological Services
- The Hopewell Eating Disorder Support Centre
- The Regional Centre for the Treatment of Eating Disorders

If you have any ethical concerns regarding your participation in this study, you may contact the Protocol Officer for Ethics in Research at the University of Ottawa.

Finally, we would kindly like to inform you that it is extremely important that you do not reveal the purpose of this study, what you did while you were here, or any other detail about the research to anyone. Doing so could bias the results of the study and lead to erroneous findings.

In closing, we would like to thank you for participating in this study. Please sign your name below to indicate that you have read this explanation and agree not to discuss this experiment with anyone.

Participant's signature: _____ Date: _____

Researcher's signature: _____

Débriefing

FORMULAIRE DE COMPTE-RENDU

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Suite à la présentation du vidéo, on vous a demandé de compléter une tâche et le questionnaire. La tâche a été utilisé pour mesurer la performance cognitive après avoir vu la vidéo. Les questionnaires étaient de mesurer vos vrais sentiments et les perceptions de vous-même. Ces déceptions ont été nécessaires afin que le véritable but de notre étude demeure inconnu des participants. Si vous aviez été au courant du but réel de l'étude, vos réponses auraient pu être biaisées. Étant donné que la déception a été utilisée dans cette étude, nous vous invitons à renouveler votre consentement en nous indiquant si oui ou non nous pouvons utiliser vos données pour notre étude. Soyez assurés que si vous choisissez de retirer vos données de l'étude, vous n'encourez aucune conséquence négative et votre point de participation lié à la recherche vous sera toujours accordé selon le Système intégré de participation à la recherche (SIPR) de l'École de psychologie.

_____ Oui, je consens et j'accepte que mes données soient utilisées pour cette étude
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Cette recherche est importante pour deux raisons. Tout d'abord, il y a très peu d'études qui se sont penchés sur le rôle des images médiatisées de l'homme sur l'image corporelle de l'homme et l'impact sur la cognition. Deuxièmement, il y a aussi très peu d'études qui ont tenté d'examiner pourquoi certains hommes sont plus influencés que d'autres par ce type d'images.

Si vous avez ressenti un malaise pendant l'expérience ou si vous souhaitez discuter davantage de vos préoccupations de santé, vous pouvez communiquer avec l'une des ressources suivantes :

- Le centre des services psychologiques
- Le centre de soutien des troubles alimentaire Hopewell
- Le Centre régional de traitement des troubles de l'alimentation

Par contre si vous avez des questions d'ordre déontologique, vous pouvez communiquer avec la responsable d'éthique en recherche de l'Université d'Ottawa.

Enfin, nous aimerions souligner qu'il est important de ne pas divulguer aucune information au sujet de cette étude incluant le but réel de l'étude et ce que vous avez fait durant l'expérience. Cela pourrait fausser les résultats de l'étude et mener à des conclusions erronées.

En terminant, nous tenons à vous remercier d'avoir participé à cette étude. S'il vous plaît signer votre nom ci-dessous pour indiquer que vous avez lu cette explication et acceptez de ne pas discuter de cette expérience.

En terminant, nous tenons à vous remercier d'avoir participé à cette étude. SVP signez votre nom ci-dessous pour indiquer que vous avez lu et compris cette explication et que vous acceptez de ne discuter aucunement de cette étude.

Signature du participant: _____
 Signature des chercheuses: _____

Date: _____