RESEARCH IN HEALTH PSYCHOLOGY

RESEARCH THESIS

An experimental study examining the impact of exposure to cosmetic surgery advertising on women's body image and intentions to undergo cosmetic surgery

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A thesis submitted in fulfilment of the requirements of the University of the West of England, Bristol for the award of Professional Doctorate in Health Psychology

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I dedicate this thesis to my family: Mum, Dad, Andrea and Lloyd. I am very grateful for their loving support, good humour and endless encouragement.

Foreword

I have been studying for my Professional Doctorate in Health Psychology at the University of the West of England since 2012. The doctorate involves the successful completion of five competencies:

1. Professional Skills
2. Consultancy
3. Behaviour Change Interventions
4. Teaching and Training
5. Research

To date, I have successfully completed the Professional Skills, Consultancy, Behaviour Change Interventions and Teaching and Training competencies. This work has been submitted, passed and the marks verified by the University of the West of England's examination board.

The research competency

The research competency is divided into two parts. Part 1 involved conducting a systematic review and part 2 a thesis. I have successfully completed part 1, the systematic review, which you will find in Appendix A. The systematic review has been submitted, passed and the marks verified by the University of the West of England's examination board. The review titled 'Risk factors for negative body image among children; a systematic review of experimental and longitudinal studies', provides the first extensive systematic review of studies examining risk factors for the development of negative body image in children.

Throughout the professional doctorate I worked at the Centre for Appearance Research (CAR), based at the University of the West of England initially as a research associate and, since 2014, as a research fellow. During this time, the nature and focus of my projects varied depending on available funding. In 2012, when the professional doctorate commenced, I worked predominantly in the field of body image and in particular I conducted body image interventions with children. It was for this reason I conducted my systematic review in this area.

In 2014, when I conceptualised and designed a study for my thesis, my research focused on the psychosocial aspects of cosmetic surgery. Drawing on my experience of working in the area of cosmetic surgery whilst acknowledging my continued interest in the field of body image, I choose a topic for my thesis that enabled me to combine both areas of interest. Consequently, although my thesis does not stem directly from the results of my systematic review, it remains grounded within the field of body image but also reflects my knowledge within the field of cosmetic surgery. This thesis has therefore been submitted for the award of Professional Doctorate in Health Psychology, for the completion of the Research competence.

Abstract

Objective: There have been calls from health professional organisations and advocacy groups to regulate and ban cosmetic surgery advertising due to concerns about increasing uptake of elective cosmetic surgical procedures that are often accompanied by substantial financial, medical and psychological costs. To date, the impact of cosmetic surgery advertisements on body image and intentions to undergo cosmetic surgery has not been examined experimentally. **Method:** A community sample of British women (*N*=193) were randomly assigned to view one of four conditions: cosmetic surgery advertisements with models, cosmetic surgery advertisements without models, beauty product advertisements with models, and beauty advertisements without models. Participants completed validated measures of state body dissatisfaction, intentions to undergo cosmetic surgery, internalisation of cultural beauty ideals and appearance comparisons. **Results:** Women exposed to advertisements featuring models reported significantly greater body dissatisfaction post exposure compared to women exposed to advertisements without models. No differences in body dissatisfaction emerged post-exposure between cosmetic surgery and beauty product advertisements with, and without, models. There were also no differences between conditions on intentions to undergo cosmetic surgery. Internalisation of cultural beauty ideals and appearance comparison tendency did not moderate these effects. **Conclusion:** Compared to exposure to beauty product advertising, exposure to cosmetic surgery advertising did not result in increased state body dissatisfaction and intentions to undergo cosmetic surgery. The effect of cumulative, longer-term exposure to cosmetic surgery advertising and the inclusion of models in advertisements should be examined in order to guide policy makers towards the most effective strategies involving this form of advertising.

Introduction

Background to research

Demand for cosmetic surgery has increased in recent years. The British Association of Aesthetic Plastic Surgeons (BAAPS) reported that 45,506 surgical procedures were performed in the UK in 2014, representing an increase of 278% since 2004 (BAAPS, 2015). Women underwent 91% of these procedures, with the five most popular procedures being breast augmentation, blepharoplasty (i.e., eye lid surgery), face/neck lift, breast reduction, and liposuction. Furthermore, over 10 million cosmetic procedures were conducted in the United States in 2014 (American Society for Aesthetic Plastic Surgery, 2014), and over 20 million worldwide (International Society of Aesthetic Plastic Surgery, 2015).

Cosmetic surgery is defined as ‘‘*operations or other procedures that revise or change the appearance, colour, texture, structure, or position of bodily features, which most would consider otherwise within the broad range of ‘normal’ for that person*’’ (Department of Health, 2013 p.6). Consequently, cosmetic surgery is always elective and rarely undertaken for medical reasons. Nevertheless, the financial, physical and psychological risks associated with surgery are substantial. Common cosmetic surgery procedures such as breast augmentation (enlargement) can cost in excess of £5,000, excluding the costs associated with replacing implants. Potential medical complications and side effects include mortality, infection, loss of sensation, scarring, blood loss, blindness, embolisms, nerve injury and significant pain (Gabriel, Woods, O’Fallon, Beard, Kurland & Melton, 1997; Fischer, Wes, Nelson, Serletti, & Kovach; 2013), while disappointment, psychological distress, anxiety and depression can occur postoperatively (Honigman, Philips & Castle, 2004; Yoho, Romaine & O’Neil, 2005; von Soest, Kvalem, & Wichstrøm, 2012). The increase in individuals prepared to accept the expense and risks

associated with cosmetic surgery is reflected in the thriving UK cosmetic industry, which is worth an estimated £3.6 billion (Department of Health, 2013).

It has been suggested that the increase in uptake of cosmetic surgery has been fuelled by the increasing availability of cheaper procedures, the normalisation of cosmetic surgery (Crerand, MaGee & Sarwer, 2012), and appearance dissatisfaction (von Soest, Kvalem, Skolleborg & Roald, 2011). Indeed, body dissatisfaction has been identified as a key predictor for seeking cosmetic surgery (Sarwer & Crerand, 2004). Research has found heightened levels of body dissatisfaction among individuals undergoing cosmetic surgery (von Soest et al., 2011) and among individuals displaying favourable attitudes towards cosmetic surgery (Henderson-king & Henderson-King, 2005; Slevec & Tiggemann, 2010, Swami, 2009). More recently, media coverage of marketing and advertising for cosmetic surgery has been blamed specifically for the increase in cosmetic procedures (Crerand et al., 2012). Indeed a recent survey conducted by the British Association of Plastic, Reconstructive and Aesthetic Surgery (BAPRAS, 2015) to explore people's influences in the decision to have cosmetic surgery found that over 50% of respondents claimed that marketing from practices made them more likely to consider a cosmetic treatment.

Cosmetic Surgery Media and Advertising

Recently, there have been calls from specialist groups (e.g., UK Feminista, 2012; British Association of Aesthetic Plastic Surgeons, 2012; All Party Parliamentary Group on Body Image, 2012) and clinicians (Fatah, 2012; Mercer, 2009) for stricter regulations on the advertising of cosmetic surgery in the UK, where there are currently no set regulations or legislation (Department of Health, 2013). Some organisations, such as the British Association of Aesthetic Plastic Surgeons, are demanding an outright ban on the advertising of cosmetic surgery to mirror regulations in France where every format of

advertising has been banned (Fogli, 2009). An argument in favour of stricter regulations is that exposure to cosmetic surgery advertisements can influence consumers' attitudes towards surgery (e.g., normalising procedures and minimising perceived risks) and negatively affect their body image (Fatah, 2012, BAAPS, 2012). Indeed, studies consistently demonstrate that exposure to messages and images of physical attractiveness depicted in various forms of the media (e.g., advertisements, music videos, magazines, television) is associated with increased body dissatisfaction among women and behavioural attempts to change their bodies in an effort to conform to cultural appearance ideals (Grabe, Ward & Hyde, 2008; Levine & Murnen, 2009; Slevec & Tiggemann, 2011). More specifically, perceived pressures from the media to alter appearance and conform to beauty ideals is associated with more positive attitudes towards cosmetic surgery and an increased likelihood of wanting to alter one's appearance with cosmetic surgery (Markey and Markey, 2010; Menzel, Sperry, Small, Thompson, Sarwer & Cash, 2011; Nerini, Matera & Stefanile, 2014; Swami, 2009).

Correlational studies looking at the impact of cosmetic surgery related media exposure have found that self-reported exposure to reality television programs featuring people undergoing cosmetic surgery make-overs (i.e., *The Swan* and *Miami Slice*) is correlated with more favourable attitudes towards cosmetic procedures, increased feelings of pressure to have cosmetic surgery, an increased likelihood of having cosmetic surgery in the future, and increased body dissatisfaction (Crockett, Pruzinsky & Persing, 2007; Markey & Markey, 2010; Nabi, 2009; Sperry, Thompson, Sarwer & Cash 2009; Sharp, Tiggemann & Mattiske, 2014). Whilst these correlational studies have made an important contribution to the field in relation to examining the association between exposure to cosmetic surgery related media, body image and cosmetic intentions they cannot specify the direction of the relationship. Indeed, these studies do not reveal whether exposure to

cosmetic surgery related media produces changes in body image and cosmetic intentions or whether individuals who are dissatisfied with their bodies or intending to undergo a cosmetic procedure seek out cosmetic surgery related media (Grogan, 2007). In addition, exposure to cosmetic surgery related media alone may not be sufficient enough to impact an individual's body image and attitudes to cosmetic surgery (Grogan, 2007). Indeed, individual factors may play an important role in determining the effect of exposure, for example, how invested an individual is in their appearance (Grogan, 2007). Experimental studies can help to unravel these effects (Grogan, 2007; Halliwell & Diedrichs, 2012).

Two experimental studies have examined the impact of viewing reality TV programs depicting people undergoing multiple cosmetic surgeries in an effort to 'make-over' their appearance and improve their confidence. Markey and Markey (2010) found that women and men who watched the reality TV program *Extreme Makeover* were significantly more likely to want to alter their appearance using cosmetic surgery post-exposure than participants who watched a home improvement show. Furthermore, Mazzeo and colleagues (2007) found that women who watched a similar show, *The Swan*, reported feeling greater media pressure to be thin in comparison to participants who were not exposed to the program (Mazzeo, Trace, Mitchell & Walker Gow, 2007). These studies provide some preliminary evidence that exposure to cosmetic surgery related media can have a direct impact on women's body image and attitudes toward surgery. However, despite calls for greater advertising regulations, the impact of exposure to cosmetic surgery advertising specifically remains unexplored in the experimental literature (Brunton et al, 2013).

Cosmetic surgery advertising has become increasingly evident and widespread (Hennink-Kaminski, Reid, & King, 2010). For example, this type of advertising has expanded from small adverts at the back of magazines to posters in spas, gyms, and salons,

and adverts on the internet, radio, public transport and social media (Department of Health, 2013, Hennink-Kaminski et al., 2010). A recent study indicated that 92% of women aged 18-69 years reported that they have been exposed to cosmetic surgery advertising (Sharp et al, 2014). These advertisements typically use images of idealised women and messages that suggest surgery is a viable and desirable way for consumers to achieve current social standards of beauty (Grogan, 2007; Lett, 2008; Spilson, Chung, Greenfield & Walters, 2002; Menzel et al, 2011). A content analysis of cosmetic surgery advertisements depicted in US magazines between 1986 and 2007 found that adverts often explicitly and implicitly promote surgery as a way of increasing one's attractiveness (Hennink-Kaminski & Reichert, 2011). Cosmetic surgery advertisements have also been compared to glossy, seductive fashion advertisements that promise an affordable, new look (Sarwer and Crerand, 2004). Indeed, Hennink-Kaminski et al (2010) found that 74.9% of cosmetic surgery advertisements displayed idealised human models.

Self-reported exposure to cosmetic surgery advertisements has been positively correlated with positive attitudes towards cosmetic surgery, and increased social motivation for, and actual consideration of, cosmetic surgery (Sharp et al., 2014). To date, however, no studies have experimentally examined the impact of advertisements for cosmetic surgery on body image and intentions to undergo cosmetic surgery. Therefore, despite calls to ban and regulate cosmetic surgery advertising, the causal effect of these advertisements on body image and intentions to undergo surgery has been untested, until now.

Moderators of Media Exposure, Body Image and Cosmetic Intentions

Past studies examining the impact of cosmetic surgery related media and advertising have largely neglected to examine the potential processes linking the media

(e.g., cosmetic surgery TV programs and advertising) and participants' body dissatisfaction and attitudes towards cosmetic surgery. Evidence from the experimental research examining the impact of exposure to media depicting cultural beauty ideals more broadly has found that there is variability in how individuals respond to media exposure and that not all women are affected equally (Halliwell & Diedrichs, 2012). Specifically, the extent to which women internalise cultural beauty ideals and compare their appearance to others has been found to moderate the relationship between media exposure and body image. Internalisation of cultural beauty ideals and appearance comparisons are central psychological processes in the Tripartite Influence Model, a well supported socio-cultural model (Thompson, Heinberg, Altabe & Tantleff-Dunn, 1999). Indeed, the Tripartite model is often used to explain the impact of the media on the development of body dissatisfaction, and more recently it has been applied to attitudes toward cosmetic surgery (Menzel et al., 2011; Sharp et al., 2014). This model stipulates that socio-cultural influences (including the media), impact the development of body dissatisfaction and attitudes toward cosmetic surgery directly (socio-cultural, i.e., the media) and indirectly (via internalisation of cultural beauty ideals and appearance comparison) (Thompson et al., 1999).

Internalisation of cultural beauty ideals is the extent to which women 'buy into' and value cultural beauty ideals (Stice, 2002). Women who internalise the thin ideal are typically more negatively affected by exposure to media images containing attractive models (Forbes et al., 2005) and hold more favourable attitudes towards cosmetic surgery (Sarwer et al., 2005; Swami, 2009). More specifically, Sharp et al (2014) found that internalisation of the thin ideal moderated the impact of media exposure (including self-reported exposure to cosmetic surgery advertisements) on participants' attitudes to cosmetic surgery and body dissatisfaction. To date, however, internalisation of the cultural

beauty ideal has not been examined experimentally in the context of exposure to cosmetic advertisements, body dissatisfaction and cosmetic intentions.

Furthermore, Social Comparison Theory (Festinger, 1954) in the context of body image posits that people evaluate their own appearance by comparing their appearance to others. People can make upward social comparisons in which they compare themselves to individuals they perceive to be superior in terms of their appearance which can result in women feeling dissatisfied with their own appearance (Tiggemann & McGill, 2004). Indeed, women who frequently compare their appearance to others are more negatively affected by exposure to the media (Dittmar & Howard, 2004). Appearance comparisons have therefore been found to moderate the impact of media exposure on body image (Dittmar and Howard, 2004, Vartanian & Dey, 2013). It is therefore necessary to examine how women's appearance comparison tendency moderates the impact of exposure to cosmetic surgery advertisements on body dissatisfaction and cosmetic intentions.

A Public Health Approach to Cosmetic Surgery Advertising

The population wide reach of cosmetic surgery advertisements (Austin, 2012) coupled with the potential serious impact of cosmetic surgery on an individual's health and wellbeing have resulted in public health researchers, clinicians, and members of private organisations exploring initiatives to regulate such advertisements (for example, the British Association of Aesthetic Plastic Surgeons have called for an outright ban). Public health initiatives are designed to improve the wellbeing of a population and are often implemented through social marketing campaigns or regulation such as law, policies and practice standards (Paxton, 2015; Austin, 2015). An example of this within the field of cosmetic surgery is France banning every type of cosmetic surgery advertisement.

There are numerous examples of effective public health initiatives within health psychology that target macro environments. For example, health warnings on tobacco packaging which is now mandatory in 77 countries and increased tax on cigarettes have had some success in reducing smoking initiation (Hammond, 2011, Austin, 2012). Indeed, in many sectors where there are potential risks to individuals, for example the financial services, tobacco, alcohol and fast food industries, there are legislations, regulations and restrictions in place (Department of Health, 2012). Macro environmental public health initiatives typically target these industries. Within the broader advertising and media industry, new initiatives are beginning to emerge (Paxton, 2015). For example, laws banning the use of unhealthy and excessively thin models in advertising and catwalks have been implemented in Israel and France. The Code of Non-Broadcast Advertising, Sales Promotion and Direct Marketing law was imposed in the UK to prevent the advertising industry from misleading consumers by overstating the results of a product (Committee of Advertising Practice, 2010). Consequently, a series of posters displayed on the London Underground depicting a woman before and after cosmetic surgery was considered a breach of responsible advertising and subsequently banned. Similarly, the American Medical Association's Code of Ethics (2001) restricts advertising that is misleading or false. Although this can to an extent help protect consumers from the advertising industry, they are not frequently utilised, and advertisements are only withdrawn following a complaint after appearing in public (Paxton, 2015).

Within the medical industry, legislation prevents prescription medicines from being advertised "*in order to avoid advertising practices conflicting with the health needs of patients"* (Department of Health, 2013 p.41). There are, however, no regulations on the advertising of surgical procedures or devices (i.e., breast implants) despite the increasing calls for an outright ban (e.g., BAAPS) or restrictions. One reason for the lack of a public

health initiative within the field of cosmetic surgery advertising is the omission of research in this area (Brunton et al, 2014). Indeed, in 2012, the Department of Health launched a review of the regulation of cosmetic interventions. The published report specifically acknowledged the concerning lack of research on the advertising of cosmetic surgery "*The use of body image in advertising is an issue of particular concern and it is an area that the committee would like to see researched more fully to understand the impact it has on vulnerable consumers*" (Department of Health, 2012 p.43).

Research examining the impact of exposure to cosmetic surgery advertisements is therefore required to help inform potential changes in policy and practice to improve population health. In line with this, the Prevention Maturation Schema, a framework developed to direct prevention research (Sallis, Owen & Fotheringham, 2000) describes the generation of evidence relevant to influence policy as the first step. The framework is based on the notion that improving public health requires the development of research (Austin, 2012). Specifically, research is required to establish a link between the risk behaviour (i.e., exposure to cosmetic surgery advertisements) and the health outcome (i.e., body dissatisfaction and cosmetic intentions) (Austin, 2015). To date, this research is lacking. Consequently, this study set out to generate novel research to begin developing a robust evidence base required to inform policy in relation to the advertising of cosmetic surgery.

Rationale for the Current Study: A Summary

Despite recent calls to ban or restrict cosmetic surgery advertising (e.g., the British Association of Aesthetic Plastic Surgeons), to date no studies have experimentally examined the impact of exposure to cosmetic surgery advertisements on women's body image and cosmetic surgery intentions. Instead, studies have focused on self-reported

exposure to cosmetic surgery featured on reality TV (Crockett et al, 2007; Nabi, 2009; Sharp et al, 2014; Sperry et al, 2009). Although television programmes are an important form of media influence to consider, people can to an extent choose to watch programs depicting cosmetic surgery. In comparison, consumers have less control over being exposed to advertisements (e.g., pop up adverts on social media, billboards). Studies that have examined the impact of cosmetic surgery media, including advertisements, have been predominantly correlational (Crockett et al, 2007; Nabi, 2009; Sharpe et al., 2014; Sperry et al, 2009), thus limiting the conclusions that can be drawn about causality. In order to begin to address the gaps in the current literature, an experimental study of the impact of cosmetic surgery advertisements is needed.

The Overall Aims

The aim of this study was to use an experimental design to ascertain if there is a causal relationship between brief exposure to cosmetic surgery advertising and increased state body dissatisfaction and intentions to undergo cosmetic surgery among women. This research focused specifically on women as they represent the core population (91%) contributing to the growth of the cosmetic surgery industry (BAAPS, 2014). First, to increase confidence in the ecological validity of the advertisements purposefully created for this study, the current study sought to replicate past health psychology research which has consistently found that exposure to advertising images featuring appearance ideal models compared to advertising images without models (i.e., products only) results in increased body dissatisfaction among women (Grabe et al., 2008). Specifically exposure to advertisements featuring a model (irrespective of product type) were compared to advertisements without models (irrespective of product type) on body dissatisfaction and intentions of undergoing cosmetic surgery. In accordance with meta-analyses of past

research experimentally examining appearance ideal media images on women's body image (e.g., Grabe et al., 2008), it was hypothesised that exposure to advertisements featuring idealised models, irrespective of the product being advertised, would be associated with greater body dissatisfaction than adverts featuring no models. Moreover, in line with previous correlational and experimental research, which has found that idealised media exposure is associated with cosmetic surgery intentions (Markey & Markey, 2011; Menzel et al, 2011; Nerini et al 2014; Swami, 2009), it was hypothesised that advertisements featuring models would be associated with greater cosmetic surgery intentions.

Second, this research aimed to examine the impact of cosmetic surgery advertising specifically in comparison to advertising for less invasive and permanent beauty products (e.g., make-up and skincare). We examined whether exposure to cosmetic surgery advertisements was associated with greater state body dissatisfaction and increased intentions of undergoing cosmetic surgery among women, in comparison to exposure to beauty product advertisements. It was hypothesised that exposure to cosmetic surgery advertisements would be associated with greater body dissatisfaction and intentions to undergo cosmetic surgery relative to exposure to beauty product advertisements. This is because cosmetic surgery is more permanent, dramatic and invasive in terms of its ability to alter appearance than beauty products such as make-up and tanning products which are temporary. Indeed, the purpose of cosmetic surgery is to permanently correct a perceived flaw in appearance.

Third, we investigated if effects were moderated by the extent to which women internalise beauty ideals and/or their tendency to make appearance comparisons. Based on previous research (Menzel et al., 2011; Sharpe et al., 2014; Dittmar and Howard, 2004), it was hypothesised that women who reported higher levels of internalisation of cultural

beauty ideals and greater tendencies towards making appearance comparisons would experience greater levels of body dissatisfaction and intentions to undergo cosmetic surgery post-exposure, compared to those with lower levels of internalisation and comparison tendencies at post-exposure.

Method

Design

To date, correlational studies have been instrumental in examining how exposure to the media depicting cosmetic surgery is associated with body image and attitudes to cosmetic surgery. These studies have made a crucial contribution to this field and shaped initial health psychology research in this area (Mullan, Todd, Chatzisarantis & Hagger, 2014). However, correlational research does not examine causal factors. For this reason correlational research only provides some of the information required for understanding the impact of exposure to cosmetic surgery related media on health outcomes and behaviour. Consequently, to improve the evidence base, research that provides an exploration of the causal mechanisms is required (Mullan et al., 2014; Grogan, 2007). Indeed, experimental studies have been described as providing a '*stepping stone'* between correlational research and the dissemination of interventions that target macro environments (Mullan et al., 2014, p.105).

There are examples of numerous public policy interventions which have been rolled out into practice prior to rigorous evaluation. Whilst these are often considered feasible and well-intended, when they are tested they can be found ineffective, unnecessary or harmful (Becker, 2011; Mullan et al., 2014). For example, the DARE prevention program designed to reduce substance abuse was rolled out across schools throughout the United States prior to testing. Research later found that the program did not significantly

reduce drug use. As a result, millions of dollars were wasted on the dissemination of an ineffective program (Becker, 2011). Health researchers and policy makers are therefore calling for high quality research evidence to inform effective population based interventions. Consequently, within the field of cosmetic surgery advertising, there is a need to establish an evidence base to inform the most effective public policy strategies. Given that the majority of research in this area is correlational, experimental studies are now required to fully understand the relationships between variables. This includes examining the psychological processes that may be involved thus providing a thorough evaluation of the causal factors (Grogan, 2007).

In order to build upon the research conducted in this area an online experimental study was conducted to examine causal relationships between exposure to cosmetic surgery advertisements and body image and cosmetic intentions, in line with the research questions. The principles of an experimental design conducted online are the same as those carried out in a laboratory (e.g. random allocation) (Reips, 2002). Indeed, research conducted via the Web has become increasingly popular. The volume of research conducted online (e.g., surveys and experiments) has grown exponentially since 1995 (Reips, 2007). The use of online survey platforms such as Survey Monkey and Qualtrics to conduct research are widely used and well-established tools for many researchers (Reips & Birnbaum, 2011). This is due to the numerous advantages of conducting research online. Laboratory based studies are often criticised for lacking external validity which can affect the generalizability of the results (Grogan 2007). Online experiments however enables participants to complete the study in a familiar place (e.g., at home) which reflects a more real life setting. Moreover, in contrast to the laboratory setting, participants are able to complete the study without being observed by the experimenter. The effects are therefore less likely to be attributed to the laboratory setting (Reips, 2002) and may reduce the risk

of demand characteristics (Robson, 1997). Furthermore, the presence and interaction of the experimenter with participants in a laboratory setting can lead to (often unintentionally) experimenter expectancy effects (Robson, 1997). As there was no experimenter – participant interaction (i.e., the presentation of the stimuli and set of instructions was automated) in this study, this particular bias was minimised. Online studies can also be more convenient for participants. They can participate at a time and place that suits them, making participation easier and consequently places fewer constraints on their choice to participate (Reips, 2002). Online research can also be cost-effective. For example, many participants can conduct the study simultaneously; as a result it is less resourceful on time, in regards to timetabling, scheduling and supervising participants.

Whilst online research methods have various advantages over laboratory based studies they also have a series of limitations that need consideration and addressing. First, although participants' lack of interaction with the researcher can reduce certain bias, it can also create potential problems. For example, in laboratory settings, experimenters are often present to answer participants' questions and verify any issues through direct communication, for example, if instructions are misunderstood (Reips, 2002). To address this potential issue, the study was pretested by nine work colleagues who were instructed to identify any grammatical and functional errors with the survey. They were also asked to provide their feedback on the clarity of the instructions displayed throughout the study. As a result of the pretesting phase, further information was included in the instructions presented to participants prior to exposure to the advertisements to inform them that each advertisement would be displayed on screen for 20 seconds. Second, in comparison to the laboratory setting, the experimenter has less control over the setting in which the experiment takes place when it is conducted online (Reips, 2002). Whilst this increases ecological validity, this is a particularly important issue given that participants were

expected to attend to and respond to stimuli presented in the study. In response to this potential disadvantage, a number of measures were put in place to encourage participants to focus on the stimuli and to measure whether or not participants attended to the advertisements (e.g., a recall task). These measures are described in detail in the procedure and discussion section. Third, online experiments are not suitable for all projects, given the nature of this study (e.g., it is not measuring participants' physiological reactions to exposure to the advertisements) and having closely considered and addressed the ethical implications (please see page 29) it was deemed suitable to be conducted online. Essentially, the methodological principles are the same online as they are in the laboratory. Furthermore, results from experimental studies conducted in a laboratory and online are, where comparable, often similar (Krantz & Dalal, 2000).

Participants

A community sample of women was recruited to participate in an online study through snowball sampling via social networking sites (i.e., Facebook and Twitter) and email. Specifically, women known to the researcher were invited to take part and were asked to forward the study website link and information to their female friends, relatives and work colleagues. Women proficient in English and aged 18 years and older were eligible to take part in this study. Given the increasingly diverse demographics of women presenting for surgery (Department of Health, 2013) and the range of age groups exposed to advertisements in the media it was important to recruit a more generalisable community sample of women in contrast to the majority of studies which focus on female undergraduate university students. Participants also had the chance of being entered into a prize draw to win a £30 shopping voucher on completion of the study as an incentive.

Materials

The advertisements were created by the researcher specifically for this study. The design was based on recent real-life advertisements for leading cosmetic surgery companies (e.g., *Make Yourself Amazing* and the *Hospital Group*) and beauty-related products commonly featured on the internet, in posters and magazines, in order to represent the various advertisements consumers are exposed to on a regular basis and through a range of media. Each condition contained seven advertisements, a number recommended in experimental research (Ata, Thompson & Small, 2013).

There tends to be two types of cosmetic surgery advertisements (Hennink-Kaminski et al., 2010), those that feature human models and those that feature only product images and text. Therefore, in order to provide a comprehensive assessment of the impact of cosmetic surgery advertising, we chose to examine the impact of cosmetic surgery advertisements featuring models and those featuring no models. In order to have suitable comparison conditions, two conditions were constructed for beauty products that are less invasive and permanent, such as make-up and tanning products. Beauty products were used in the comparison condition because previous research has shown that advertisements featuring appearance related products do not result in greater body dissatisfaction than advertisements featuring, neutral household products (Birkeland, Thompson, Herbozo, Roehrig, Cafri & van den Berg, 2005). Moreover, using neutral, household products could limit ecological validity given that advertisements of this nature are generally less evident in certain media (i.e., women's magazines, social media etc.) in comparison to advertisements for beauty products (Birkeland et al., 2005). For this reason beauty product advertisements, frequently encountered in the media, were considered to be more suitable comparison conditions. In addition, the use of completely neutral stimuli (e.g., a landscape) as a comparison could introduce numerous confounding variables, such as the design and

styling of the advertisement, which can limit the interpretation of findings (Diedrichs & Lee, 2011).

Specifically, one condition with beauty product advertisements featuring models was constructed and one condition featuring beauty products without models. The design and layout of the advertisements were identical across each condition to ensure only the product type (i.e., cosmetic surgery or beauty products) and the inclusion of a model differed between each condition. The models used in the advertisements were obtained from real-life cosmetic surgery adverts from 2013 onwards to increase ecological validity.

For the condition featuring cosmetic surgery and models (CosM), participants viewed advertisements featuring images of female models whose appearance conforms to current Western beauty ideals alongside text advertising cosmetic surgery procedures (e.g., breast augmentation) (Appendix B). For the cosmetic surgery without models condition (CosNM), the advertisements were identical to the previous condition; however, the models were removed (Appendix C). For the advertisements featuring beauty products and models (BeautyM), the model remained the same, however, the product was replaced with a less permanent and invasive beauty product (e.g., body moisturiser, lipstick, makeup, fake tan, skin foundation and body spray) (Appendix D). Finally, for the advertisements featuring beauty products without models (BeautyNM), the model was removed from the beauty product advertisements (Appendix E).

Pilot Study

In accordance with previous media exposure studies (e.g., Diedrichs & Lee, 2011), an online pilot study was conducted with 64 women to assess whether the advertisements designed specifically for this study were considered to be similar to genuine advertisements found in real-life media and were seen as '*professional-looking*'

advertisements. An opportunity sample of female undergraduate psychology students was recruited from the participant pool at the University of the West of England. The mean age of participants was 19.5 (*SD*= 1.40, age range: 18-24 years) and 73.4% identified as White British. Participants received course credit for taking part and were randomly assigned to view one of the four advertisement conditions, rating a total of 7 advertisements. They were asked to respond to the following questions (Diedrichs & Lee, 2011) regarding the advertisement using a 7-point Likert scale (*1= strongly disagree* to *7= strongly agree*); "*I think this advertisement is similar to those you would find in the media (i.e., women's fashion/health magazines, online)*", "*This advertisement is effective*" and "*This advertisement looks like the professional adverts you see in the media*".

A series of one-way between group analysis of variance (ANOVAs) were conducted to examine differences between the advertisement conditions on perceived "similarity" to advertisements in real media, in addition to how "professional looking" and "effective" the advertisements were. Means and standard deviations are displayed in Table 1. No significant differences were found between conditions in terms of advertisement effectiveness ($F(3,63) = 2.69$, $p<.06$). A statistically significant difference was found between conditions in terms of viewers' perception of how professional the advertisements were ($F(3,61) = 3.87$, $p<.05$.) Post hoc comparisons indicated that the advertisements in the condition featuring cosmetic surgery without models were perceived to be less professional looking than the advertisements in the condition featuring beauty products and model. Furthermore, a statistically significant difference in similarity scores for the conditions were found ($F(3,62)=3.73$, $p<.05$). Again, post hoc comparisons indicated that the cosmetic surgery with no model condition was perceived to be less similar looking to advertisements found in the media than the advertisements in the condition featuring beauty products and a model. To conclude, the only significant differences were found

between the cosmetic surgery advertisements with no model and the beauty products advertisements with a model. No direct comparisons between these conditions were necessary to address the study aims and hypotheses; therefore, all advertisements were retained for the main study.

Table 1: Pilot study: mean scores and standard deviations for ratings of advertisements' similarity to media, professional looking and effectiveness (n = 64).

	Similarity Mean (SD)	Professional Looking Mean (SD)	Effective Mean (SD)
Cosmetic Surgery Model	4.95 (0.81)	4.54 (0.89)	4.71 (0.83)
Cosmetic Surgery No Model	4.50 (1.10)	3.79 (0.94)	3.74 (1.10)
Beauty Products Model	5.72 (0.87)	4.96 (1.04)	4.57 (1.33)
Beauty Products No Model	4.80 (1.35)	4.02 (1.32)	4.02 (1.21)

The scores ranged from 1 ('*strongly disagree'*) to 7 ('*strongly agree'*).

Measures

Participants in the main study completed the following self-report measures, all of which have satisfactory internal reliability, psychometric properties and have been widely used by women aged 18 years and over.

State Body Dissatisfaction. Participants completed three Visual Analogue Scales (VAS) measuring state body dissatisfaction before and immediately after exposure to the 7 advertisements in their condition. Participants were required to indicate how satisfied they felt about their 1) weight, 2) appearance, and 3) size and shape 'right now' on a 100 mm horizontal line ranging from 'not at all' (0) to 'very much' (100). The items were; "*How satisfied do you feel about your weight right now?*", "*How satisfied do you feel about your appearance right now?*" and "*How satisfied do you feel about your size and shape right*

now?" A score for state body dissatisfaction was computed by averaging the three visual analogue scale measures (pre exposure *Cronbach's* α =.93; post exposure α = .94). Scores for state body dissatisfaction ranged from 0 to 100. Lower scores indicated greater body dissatisfaction (Appendix F). VAS have shown good construct validity (Heinberg & Thompson, 1995) and are frequently used in experimental media exposure studies because they can be administered quickly and measure changes in state body image reliably (Tiggemann, Slater, Bury, Hawkins & Frith, 2013). VAS are especially advantageous in studies where participants are required to complete the same measure multiple times as they cannot accurately recall where they made their initial mark (Tiggemann, et al., 2013).

Cosmetic Surgery Intentions. The Actual Consideration subscale from the Acceptance of Cosmetic Surgery Questionnaire (ACSS; Henderson-King & Henderson-King, 2005) was used to measure the post-exposure likelihood that participants would consider undergoing a cosmetic surgical procedure (Appendix G). This is a 5-item measure with a 7-point Likert scale (1 = *strongly disagree*; 7 = *strongly agree*). Items include "*In the future, I could end up having some kind of cosmetic surgery*" and "*I have sometimes thought about having cosmetic surgery*". Higher scores reflect greater intentions to undergo a cosmetic surgery procedure in future. Previous research has found that the scale has high internal consistency, reliability and good convergent validity in samples of women across a wide span of ages (Henderson-King & Henderson-King, 2005). It is frequently used in research of this nature (Markey & Markey, 2009; Slevec & Tiggemann, 2010). Cronbach's α for this sample was 0.88.

Internalisation of Cultural Beauty Ideals. The internalisation-general subscale of the Sociocultural Attitudes Towards Appearance Scale-3 (SATAQ-3; Thompson, van den

Berg, Roehrig, Guarda & Heinberg, 2004) was administered post-exposure to assess the extent to which participants have internalised current cultural ideals of beauty (Appendix H). The internalisation subscale includes 9 items (e.g., "*I would like my body to look like the models who appear in magazines*") measured with a 5-point Likert scale (1 = *definitely disagree*; 5 = *definitely agree*). Higher scores indicate greater internalisation of beauty ideals. The SATAQ-3 has been used extensively in the field of body image. In prior samples, the general internalisation subscale of the SATAQ-3 has demonstrated excellent internal reliability (α =0.96; Thompson et al., 2004). Internal consistency for the current sample was high α = 0.93.

Appearance Comparisons. The Upward Comparison Scale (O'Brien, Caputi, Minto, Peoples, Hooper, Kell & Sawley, 2009) was administered post-exposure to measure participants' tendency to make appearance-related comparisons (Appendix I). The scale consists of 10 items (e.g., "*When I see good looking people I wonder how I compare to them*" and "*When I see a person with a great body, I tend to wonder how I 'match-up' with them*") and measured with a 5-point Likert scale (1= *strongly disagree*; 5 = *strongly agree*). Higher scores reflect a greater tendency to make upward appearance comparisons. This measure has good internal consistency and construct validity among women (O'Brien et al., 2009) providing a psychometrically robust assessment of participants tendency to compare their appearance to individuals believed to be more attractive. Cronbach's α for this sample was 0.95.

Demographics. Participants were asked to self-report their age, ethnicity, relationship status, education, height, and weight. Self-reported height and weight were collected in order to calculate women's body mass index (BMI). Participants were also

asked whether they had an invasive cosmetic surgery procedure or a minimally invasive procedure in the past. Participants were asked to respond to these questions by circling '*yes'* or '*no'*. If participants circled '*yes'*, they were asked to specify what procedure(s) they had undergone.

Ethical Considerations

Ethical approval from the University of the West of England was obtained prior to participant recruitment (see Appendix J, K, L and M).

Withdrawing from the study. Participants were informed that they could withdraw from the study whenever they want and for whatever reason. If participants wished to withdraw once they had started completing the study they were informed to exit the survey which could be done by clicking the small cross at the top of the webpage to exit the survey. Participants were also informed that they could withdraw their data from the study within four weeks of taking part. To do this they were told to email the lead researcher quoting their unique participant identification code (which they generated prior to commencing the study) and their data would be deleted.

Confidentiality. The information provided by participants was treated with the highest level of confidentiality. As the study was completed online, participants generated their own unique participant identification code (the first three letters of their mother's maiden name and the day of their birthday) so that the researchers did not know the participant's identity.

Data storage. The data was downloaded straight from Qualtrics into SPSS. The database was kept in a password protected computer which remained in a locked office. The data was only accessible to those working on the project. The data were securely stored on the lead researcher's computer and will be saved for five years (in line with the regulations stated by the British Psychological Society). After five years the data will be destroyed. The lead researcher takes full responsibility for maintaining data protection.

*Psychological risks***.** Participants were informed that the study would include some questions that participants may find embarrassing or uncomfortable to answer and which could raise sensitive issues and lead to feeling mild levels of discomfort (e.g., questions in relation to body image). It was up to the individual participant to make an informed choice as to whether they carried on or stopped participating in the study. Their right to withdraw at any time and for any reason was emphasized at the beginning of the study. In addition, the measures included in this study were psychometrically established measures of body image, cosmetic intentions, internalisation of cultural beauty ideals and appearance comparison that are frequently used in research with adults. Prior research has found that using these scales that ask participants about body image are not associated with any negative outcomes (Celio, Bryson, Killen & Barr, 2003).

The advertisements used in this study were based on adverts currently available in the media and therefore considered suitable by the UK Advertising Standards Agency. The media images used were not potentially more harmful than the advertisements participants would encounter in normal day to day life (e.g., popping up on the internet or reading a fashion magazine). Furthermore, participants were informed at the beginning of the study that they would be exposed to a number of media images.

The actual nature of the study was not disclosed to participants until the end of the study. Participants were then fully debriefed and informed of the purpose of the research and outcomes. Participants were provided with a rationale for the use of deception i.e., that the purpose of the study was not disclosed to them at the beginning of the study because sometimes when participants are aware of the study's aims and objectives this can unintentionally affect the way they respond to stimuli and answer questions, which can affect the outcomes.

Procedure

The study was titled "*Women's opinions on Media and Advertising Images*" and was described as a study investigating the effects of media images on women's wellbeing, mood and perceptions of advertising effectiveness. In line with previous experimental media exposure studies (e.g., Halliwell & Dittmar, 2004), the aims of the study were masked in an attempt to reduce demand characteristics. The study was conducted online and hosted by Qualtrics, a secure, online survey platform. Participants completed the survey unsupervised, in a location of their choice.

Once participants consented, block randomisation was used to systematically assign individuals to one of the four experimental advertisement conditions. Participants completed a set of seven generic questions asking them about their media consumption (e.g., '*how many hours of television do you watch on an average day?*'). These questions supported the cover story and were not analysed. Participants also completed the pre-exposure state body image VAS questions and six mood items (e.g., happy, excited, upset, ashamed, confident and depressed) which were not analysed but included to disguise the focus on body image (Tiggemann et al., 2013). Participants were then sequentially shown

seven advertisements. Each advertisement was shown for 20 seconds to ensure that all participants were exposed to each advertisement for a specific length of time. Participants were asked to respond to each of the advertisements displayed using Tiggemann et al's., (2013) questions; "*If I saw this advertisement in the media it would catch my eye*", "*I like the layout of this advertisement*", "*This advertisement is creative*" and "*Overall, this advertisement is effective*". Again, these questions were intended to increase the credibility of the cover story and to make sure participants attended to each advertisement. However, at no point during exposure to the advertisements were participants instructed to attend to specific stimuli (i.e., the model).

Following exposure to the advertisements, participants completed the post-exposure VAS measures of body image (and mood), followed by the validated measures of cosmetic surgery intentions and the trait measures of moderating variables internalisation of the cultural beauty ideals and appearance comparison. Next participants completed a memory recall task whereby participants were instructed to write down everything they could remember about the advertisements they were shown at the beginning of the study. This was included to increase the credibility of the cover story and to assess if participants attended to the advertisements during the study. This was particularly important given that the study was conducted online, which meant that the researcher was not present to ensure participants were paying attention to the stimuli. As a manipulation check, participants were asked to write down what they thought the specific purpose of the study was to assess whether they were aware of the true nature of the study (Halliwell & Dittmar, 2004). None of the participants correctly identified the true purpose of the study; however, six participants across the four conditions failed to respond to both the memory recall task and the manipulation question, and were subsequently deleted from the data set. Of those that responded to the recall task, it was evident that participants had attended to the

advertisements in their condition. Four participants who had undergone a cosmetic procedure (breast augmentation *n*=3; pinnaplasty *n*=1) were removed from the data set to reduce this as a possible confound. Finally, demographic data were collected and participants were debriefed.

Results

Sample Characteristics

The final sample consisted of 193 women, 76% of whom identified as White British (10.9% as "White Other"; 13.1% as "Other"). The mean age of participants was 30.4 years (*SD* = 11.12), the median was 27.5 years and the age range was 18-69 years. Over 82% of the sample were under 40 years of age. The average BMI was 23.29 (*SD* = 4.25, range 15.2 = underweight to 45.20 = obese), which is characterised as 'healthy weight' according to the National Health Service (NHS, 2015). The sample included women who were single (22.8%), married (29%), cohabiting (22.3%), in a relationship but not living together (20.7%), divorced (1%) and separated (1%). Almost the entire sample (99.5%) had completed high school, and 72.5 % were educated to undergraduate or postgraduate level. Forty-seven women formed the cosmetic surgery with models (CosM) advertisement condition, 48 formed the cosmetic surgery advertisement without models (CosNM) condition, 49 formed the beauty products with models (BeautyM) condition, and 49 formed the beauty products without models (BeautyNM) condition. Table 2 provides a breakdown of sample characteristics according to condition.

Table 2: Sample characteristics according to experimental condition.

	Condition (number in each condition)			
Demographics	CosM (n=47)	CosNM (n=48)	BeautyM (n=49)	BeautyNM (n=49)
AGE				
Mean age (SD)	28.49 (11.50)	31.53 (10.90)	31.77 (12.51)	29.67 (9.36)
Min - max age	18 - 64	19 – 63	18 - 66	18 - 55
BMI				
Mean BMI (SD)	23.36 (4.18)	23.49 (4.76)	22.86 (3.95)	23.48 (4.16)
ETHNICITY				
White: British	78.7%	75%	72.9%	77.6%
White: Irish	-	4.2%	6.3%	-
White: Other	12.8%	10.4%	8.3%	12.2%
Mixed: White and Black Caribbean	4.3%	-	2.1%	-
Mixed: White and Black African	-	-	-	-
Mixed: White and Asian	-	4.2%	-	-
Mixed: Other mixed	-	-	-	2.0%
Asian or Asian British: Indian	-	2.1%	-	2.0%
Asian or Asian British: Pakistani	-	-	-	2.0%
Asian or Asian British: Bangladeshi	-	-	-	-
Asian or Asian British: Other	-	-	2.1%	4.1%
Black or Black British: Black Caribbean	2.1%	2.1%	-	-
Black or Black British: Black African	-	-	-	-
Black or Black British: Other Black	-	-	-	-
Chinese or Other Ethnic Group: Chinese	2.1%	-	-	-
Other	-	2.1%	8.2%	-
MARITAL STATUS				
Married	29.8%	22.9%	31.3%	32.7%
Civil partnership	-	-	-	-
Single, never married	23.4%	25%	16.7%	26.5%
Separated	-	2.1%	-	2.0%
Divorced	2.1%	2.1%	-	-
Cohabiting	19.1%	31.3%	22.9%	16.3%
In a relationship but not living together	23.4%	16.7%	22.9%	20.4%
Other	-	-	-	-
EDUCATION				
GCSE/O Level or equivalent	4.3%	2.1%	-	-
A Level or equivalent	27.7%	18.8%	10.4%	22.4%
Higher education certificate or diploma	4.3%	6.3%	6.3%	6.1%
Undergraduate degree (BSc, BA)	38.3%	37.5%	39.6%	32.7%
Masters degree	14.9%	25%	22.9%	22.4%
PhD or equivalent	10.6%	10.4%	20.8%	16.3%
No qualifications	-	-	-	-

Demographic and Baseline Equivalence of Conditions

One-way ANOVAs revealed that there were no significant demographic differences between the women across the four experimental conditions on age ($F(3, 142) = .714$, $p<.55$) or BMI ($F(3, 181) = .223$, $p<.88$). Kruskal-Wallis tests revealed that there were no significant differences across the experimental conditions on marital status ($X (3 = 192) = 1.234$, $p<.75$) or education level ($X (3 = 192) = 6.520$, $p<.09$). An ANOVA indicated there were also no differences between women across the four conditions on pre-exposure body image state ($F (3, 185) = .559$, $p<.64$).

Analysis plan

Conducting a MANCOVA was an option. However, because internalisation of the cultural beauty ideal and appearance comparisons were continuous variables, it would have been necessary to conduct a median split on the variables to categorise people into high and low internalisation and high and low on appearance comparison tendency in order to conduct a MANCOVA. There is concern with median splits in relation to issues associated with spurious effects and power (see Maxwell & Delaney, 1993). It was therefore decided that moderated multiple regression would be the preferential option which involved re-coding the advertisement condition. Indeed, numerous media exposure studies within the field of body image have used these analyses (e.g., Fardouley, Diedrichs, Vartarian & Halliwell, 2015).

Regression Analyses

To examine the impact of exposure to the advertisement conditions on women's post-exposure state body image and cosmetic surgery intentions, and the potential moderating effects of the extent to which women internalise cultural beauty ideals and make appearance comparisons, a series of hierarchical moderated multiple regression analyses were conducted. Baseline body image state was significantly correlated with post-exposure body image state and cosmetic surgery intentions, therefore mean-centred baseline body image state scores were entered as a covariate at Step 1 in all analyses. BMI was significantly correlated with post-exposure body image state (but not to cosmetic surgery intentions), therefore, mean-centred BMI scores were also entered as a covariate at Step 1 in the regression analyses investigating post exposure body image state.

A post-hoc power analysis was conducted using G* Power 3.1 with an alpha level of $p < .05$ (Faul, Erdfelder, Buchner & Lang, 2009). There was sufficient statistical power to detect medium (.98 ; f^2 =.15) and large (.99; f^2 =.35) effects, but insufficient power to detect small effects (.22 ; f^2 = .02) (Cohen, 1992).

Data Screening

The data were checked for normality, accuracy of data entry, missing values and outliers prior to the analyses. Maximum and minimum scores for each variable were within the correct range. Each variable had less than 5% of data missing, and Little's MCAR (Missing Completely At Random) test showed missing data was non-systematic. Missing data was therefore addressed with listwise deletion. The distributions for each variable were checked for univariate outliers and normality. Using a critical value of +/- 3.29, BMI was the only variable with significant skew and kurtosis. Two univariate outliers were

found and an inverse transformation was performed on BMI. To test for multivariate normality, Mahalanobis distances using regression was calculated. Three multivariate outliers were found; as they were not extreme scores they were retained for further analysis. Homoscedasticity, multicollinearity and singularity were satisfactory. All analyses were run with and without transformed data (i.e., BMI) and multivariate outliers, as no changes in the interpretation of the results were found, the untransformed data were retained and reported. Means and standard deviations for study variables are reported in Table 3.

Table 3: Mean baseline state body image, post exposure state body image, cosmetic surgery intentions, appearance comparisons and internalisation by condition.

Condition	Baseline Body Image State (SD)	Post exposure Body Image State (SD)	Cosmetic Surgery Intentions (SD)	Appearance Comparisons (SD)	Internalisation (SD)
CosM	53.28 (23.91)	50.34 (22.67)	2.95 (1.88)	2.95 (1.31)	24.85 (10.11)
CosNM	56.33 (25.99)	55.09 (28.20)	3.21 (1.57)	3.16 (0.90)	24.23 (8.48)
BeautyM	52.84 (27.32)	50. 40 (27.99)	3.03 (1.48)	3.33 (1.13)	26.96 (8.17)
BeautyNM	49.62 (22.68)	50.61 (23.51)	3.36 (1.75)	3.31 (0.96)	27.04 (10.04)

Impact of Exposure to Advertisements on Body Image

The first regression analysis was conducted to examine the impact of exposure to the advertisement conditions on women's state body image, and the potential moderating effects of internalisation of cultural beauty ideals. Table 4 displays the results from the regression analyses. Mean centred BMI and baseline body image state scores were entered as covariates at Step 1. Advertisement condition was dummy coded into planned contrasts

and entered at Step 2. Three advertisement comparisons were created to test the hypotheses. The first planned contrast examined the difference between exposure to advertisements featuring models (labelled 'Model' condition) vs. exposure to advertisements featuring no models (labelled 'No model' condition), irrespective of product type. The second and third planned contrasts were created to examine the impact of exposure to cosmetic surgery advertisements compared to exposure to beauty product advertisements. Specifically, the second contrast examined the difference between cosmetic surgery advertisements with models vs. beauty product advertisements with models. The third contrast investigated the difference between cosmetic surgery advertisements without models and beauty product advertisements without models. To examine the moderating effects of internalisation, mean-centred scores for internalisation were entered at Step 3, followed by interaction terms between each of the advertisement condition contrasts and internalisation at Step 4.

As can be seen in Table 4, baseline body image state and BMI accounted for a significant proportion of the variance in women's post-exposure body image state. Once BMI and baseline body image were controlled, exposure to the advertisements added to the variance in body image state but only marginally (p =.074). Internalisation also significantly accounted for variance in women's body image state, although the inclusion of the interaction terms between the advertisement contrasts and internalisation at Step 4 did not. The final model explained significant variance in body image state (R^2 = .88, adjusted R^2= .87, F(9, 165) = 128.56, P <.001). In the final model, while BMI no longer contributed to post exposure body image state, baseline body image state and internalisation continued to explain significant portions of the variance in women's post exposure body image state. Greater internalisation of the beauty ideals was associated with

poorer post-exposure body image state. Additionally, poorer baseline body state was associated with poorer post-exposure body image state.

As hypothesised, significant coefficients for planned comparisons indicated that women who were exposed to advertisements featuring models reported significantly greater body dissatisfaction (M = 50.37) at post-exposure than women exposed to advertisements without models (M= 52.85). However, contrary to the hypothesis, there was no significant difference in post-exposure body image state between women exposed to cosmetic surgery advertisements featuring models and women exposed to beauty product advertisements featuring models. Furthermore, there was no difference between women's body image state between those exposed to cosmetic surgery advertisements without models and those exposed to beauty advertisements without models. As such, the planned comparisons indicated that exposure to models was associated with increased body dissatisfaction, irrespective of product type. They also indicated that, irrespective of whether advertisements featured models or no models, exposure to advertisements featuring cosmetic surgery products did not result in greater body dissatisfaction relative to beauty product advertisements.

Contrary to our hypotheses, the coefficients for the interaction terms were not significant indicating that these effects were not moderated by internalisation. Furthermore, in the regression analysis that examined the moderating effects of tendency to make appearance comparisons, appearance comparison tendency was not a significant moderator of the observed effects (See Table 5).

Table 4: Hierarchical moderated regression analysis examining the impact of advertisement exposure condition and internalisation as a moderator on women's body image state.

Step and variable	*B*	*β*	*t*	95% Confidence interval for *B*		sr^2	R^2	Adj R^2	ΔR	*df*	ΔF
				Lower	*Upper*						
Step 1							.86	.86	.86	2,172	538.28***
Body Mass Index	.13	.02	.58	-.30	.55	.00					
Baseline Body Image	.94	.91	28.48***	.87	1.00	.61					
Step 2							.87	.86	.01	3,169	2.36
Model vs. NoModel (1)	3.54	.07	2.52*	.76	6.32	.00					
CosM vs.BeautyM (2)	2.23	.04	1.10	-1.76	6.21	.00					
CosNM vs. BeautyNM (3)	.74	.01	.36	-3.27	4.74	.00					
Step 3							.87	.87	.00	1,168	5.70*
Internalisation (Int)	-.30	-.11	-1.96*	-.60	.00	.00					
Step 4							.88	.87	.00	3, 165	1.35
1 x Int	.26	.07	1.67	-.05	.57	.00					
2 x Int	-.13	-.02	-.55	-.58	.32	.00					
3 x Int	-.20	-.04	-.92	-.64	.23	.00					

*Note. Reported B, β, t, sr^2 are from the final model. *p<.05. ***p<.001, CosM = cosmetic surgery with model, CosNM = cosmetic surgery with no model, BeautyM = beauty advertisement with model, BeautyNM = beauty advertisement with no model.*

Table 5: Hierarchical moderated regression analysis examining the impact of advertisement exposure condition and appearance comparisons as a moderator on women's body image state.

Step and variable	*B*	*β*	*t*	95% Confidence interval for *B*		sr^2	R^2	Adj R^2	ΔR	*df*	ΔF
				Lower	*Upper*						
Step 1							.86	.86	.86	2,173	540.08***
Body Mass Index	.21	.03	.97	-.21	.63	.00					
Baseline Body Image	.95	.93	29.52***	.89	1.02	.66					
Step 2							.87	.86	.01	3,170	2.35
Model vs. NoModel (1)	3.84	.08	2.74**	1.07	6.60	.01					
CosM vs. BeautyM (2)	1.57	.03	.77	-2.44	5.58	.00					
CosNM vs. BeautyNM (3)	.64	.01	.32	-3.30	4.59	.00					
Step 3							.87	.87	.00	1,169	4.39*
Appearance Comparisons (Comp)	-1.56	-.07	-1.33	-3.88	.75	.00					
Step 4							.87	.87	.00	3,166	1.12
1 x Comp	.99	.03	.73	-1.68	3.66	.00					
2 x Comp	-.78	-.02	-.45	-4.17	2.62	.00					
3 x Comp	-3.41	-.07	-1.59	-7.65	.83	.00					

*Note. Reported B, β, t, sr^2 are from the final model. *p<.05 ** p<.01***p<.001. CosM = cosmetic surgery with model, CosNM = cosmetic surgery with no model, BeautyM = beauty advertisement with model, BeautyNM = beauty advertisement with no model.*

Impact of Exposure to Advertisements on Cosmetic Surgery Intentions

A hierarchal moderated multiple regression was conducted to examine the impact of exposure to the advertisement conditions on women's intentions to have cosmetic surgery, and the potential moderating effects of internalisation. Table 6 provides a summary of this regression analysis. Baseline body image state was significantly associated with women's cosmetic surgery intentions. With baseline body image state controlled for, exposure to the advertisement conditions failed to contribute to the variance

accounted for in cosmetic surgery intentions, however, internalisation of beauty ideals significantly added to the variance. Furthermore, the inclusion of the interaction terms between the advertisement contrasts and internalisation did not significantly add to the variance explained in cosmetic intentions.

A significant proportion of the total variance in women's cosmetic intentions was accounted for in the final model (R^2 =. 19, *adjusted* R^2 = .15, F (8, 169) = 4.89, p <.001). Baseline body image state explained a significant proportion of the variance in cosmetic intentions. Higher levels of body dissatisfaction at baseline were associated with increased intentions for cosmetic surgery. Contrary to predictions, however, none of the coefficients for the advertisement contrasts were significant, suggesting that across all conditions exposure to the advertisements had no impact on women's intentions to have cosmetic surgery. In addition, the coefficients for the interaction terms were not significant implying that internalisation did not moderate the impact of exposure to advertisement type on women's cosmetic intentions.

Table 6: Hierarchical moderated regression analysis examining the impact of advertisement exposure condition and internalisation as a moderator on women's cosmetic intentions.

Step and variable	*B*	*β*	*t*	95% Confidence interval for *B*		sr^2	R^2	Adj R^2	ΔR	*Df*	ΔF
				Lower	*Upper*						
Step 1							.06	.06	.06	1,176	12.12**
Baseline Body Image	-.01	-.20	-2.80**	-.02	-.00	.04					
Step 2							.07	.05	.01	3,173	.37
Model vs. Nomodel (1)	.25	.07	1.07	-.21	.71	.05					
CosM vs. BeautyM (2)	-.13	-.03	-.38	-.78	.53	.00					
CosNM vs. BeautyNM (3)	-.18	-.05	-.52	-.84	.49	.00					
Step 3							.17	.14	.02	1,172	19.94***
Internalisation (Int)	.02	.11	.82	-.03	.07	.00					
Step 4							.19	.15	.02	3,169	1.45
1 x Int	.03	.12	1.17	-.02	.08	.02					
2 x Int	.06	.14	1.58	-.01	.13	.01					
3 x Int	.02	.07	.63	-.05	.09	.00					

*Note. Reported B, β, t, sr^2 are from the final model. **p<.01. ***p<.001.CosM = cosmetic surgery with model, CosNM = cosmetic surgery with no model, BeautyM = beauty advertisement with model, BeautyNM = beauty advertisement with no model.*

Finally, a further regression analysis examined the moderating effects of tendency to make appearance comparisons (instead of internalisation) on condition exposure and cosmetic surgery intentions. Appearance comparison tendency was not a significant moderator of the observed effects (See Table 7).

Table 7: Hierarchical moderated regression analysis examining the impact of advertisement exposure condition and appearance comparisons as a moderator on women's cosmetic intentions.

Step and variable	*B*	*β*	*t*	95% Confidence interval for *B*		sr^2	R^2	Adj R^2	ΔR	*df*	ΔF
				Lower	*Upper*						
Step 1							.07	.06	.07	1,177	12.31**
Baseline Body Image	-.02	-.22	-2.95**	-.03	-.01	.04					
Step 2							.07	.05	.01	3,174	.37
Model vs. Nomodel (1)	.23	.07	.96	-.24	.71	.00					
CosM vs. BeautyM (2)	-.06	-.01	-.16	-.74	.63	.00					
CosNM vs. BeautyNM (3)	-.03	-.01	-.08	-.71	.65	.00					
Step 3							.11	.09	.04	1,173	7.91**
Appearance Comparisons (Comp)	.12	.08	.61	-.26	.49	.00					
Step 4							.13	.09	.01	3,170	.92
1 x Comp	.10	.04	.45	-.35	.55	.00					
2 x Comp	.39	.13	1.35	-.18	.96	.01					
3 x Comp	.31	.09	.87	-.40	1.03	.00					

*Note. Reported B, β, t, sr^2 are from the final model. **p<.01. CosM = cosmetic surgery with model, CosNM = cosmetic surgery with no model, BeautyM = beauty advertisement with model, BeautyNM = beauty advertisement with no model.*

Discussion

There have been calls from health professional bodies and advocacy groups to regulate and ban cosmetic surgery advertising due to concerns about increasing rates of elective cosmetic surgical procedures that are often accompanied by substantial financial, medical and psychological costs. The aim of this study was to investigate the impact of brief exposure to cosmetic surgery advertising on women's state body dissatisfaction and cosmetic surgery intentions relative to exposure to beauty product advertising, and to examine whether the extent to which women internalise beauty ideals and make appearance comparisons moderated these effects. As hypothesised women exposed to

advertisements featuring models, irrespective of the product type depicted, reported significantly greater state body dissatisfaction at post-exposure than women exposed to advertisements without models. These finding are in line with Birkeland et al (2005) who found that advertisements featuring models produced higher levels of body dissatisfaction than advertisements featuring both neutral and appearance-related products. These findings along with an enormous body of evidence demonstrate that exposure to idealised media images can have a negative impact on body image, at least in the short-term (Grabe et al., 2008). Contrary to prediction, however, there were no significant differences in post-exposure body image state between women exposed to cosmetic surgery advertisements and those exposed to beauty product advertisements, irrespective of whether models were present or not. These findings suggest that the effect of exposure to advertisements on body image was specific to the presence of a model, with no additional effect gained by cosmetic-surgery product stimulus. In other words, the adverse effect on state body image occurred irrespective of whether models were featured alongside cosmetic surgery products or less invasive and permanent beauty products such as make-up. Future research may benefit from using a body site specific measure or an open ended state measure of body dissatisfaction (e.g., the Self-Discrepancy Index (Dittmar, Beattie, & Friese, 1996; Halliwell & Dittmar, 2006)) as these measures may be more sensitive to the impact of cosmetic surgery advertising, such that, advertising may make women more dissatisfied with a particular area of their body but not with their overall body dissatisfaction.

With respect to the impact of advertising on cosmetic surgery intentions, contrary to hypotheses, exposure to advertisements had no impact on women's cosmetic surgery intentions across all conditions. Of particular interest, brief exposure to cosmetic surgery advertisements specifically had no impact on women's intentions for cosmetic surgery, nor did exposure to beauty product advertisements. These findings are surprising given that

previous research, albeit mainly correlational, has found that cosmetic surgery media exposure is associated with increased cosmetic surgery intentions (e.g., Swami; 2009; Nerini et al 2014), and more specifically that self-reported exposure to cosmetic surgery advertisements is positively correlated to cosmetic surgery attitudes (Sharp et al., 2014). It may be that past correlational studies have shown a relationship because women who want to have cosmetic surgery may be more likely to seek out this type of media and advertising, whereas the current study suggests that simply viewing the advertisements does not causally increase cosmetic surgery intentions at least in the short term. Indeed, it may also be that the amount of exposure in this study was too little and too brief to influence surgical intentions, or, advertisements with little context and models unknown to participants have no effect. Experimental research looking at the impact of exposure to cosmetic surgery reality television shows has found that this type of media exposure increases surgical intentions (Menzel et al, 2011; Markley & Markey, 2011). This could be because this type of media is longer (i.e., episodes usually last for 60 minutes, with multiple episodes in one season). Additionally, as opposed to the brief exposure to one-dimensional people in advertisements in this study, viewers of cosmetic surgery reality TV programs are exposed to lengthy narratives characterised by emotive personal life stories and extreme transformations, which imply that cosmetic surgery has unequivocally and positively transformed the life and confidence of the individual. Although this study found no direct effect of brief exposure to cosmetic surgery advertisements on women's cosmetic intentions, it is plausible that increased levels of body dissatisfaction and positive attitudes towards cosmetic surgery may occur after repeated exposure to surgery advertisements featuring models over a longer period of time, which may later lead to increased intentions to undergo cosmetic surgery. Further research is needed to examine the longer-term and cumulative effect of exposure to cosmetic surgery advertising in more naturalistic settings.

Contrary to prediction, the extent to which women internalise beauty ideals and make appearance comparisons did not moderate the effect of exposure to advertisements on body dissatisfaction or cosmetic intentions. This is despite research demonstrating that internalisation moderates the effect of exposure to media (e.g., advertisements) on body image and attitudes to cosmetic surgery (e.g., Diedrichs & Lee, 2010; Sharp et al., 2014). These current findings are somewhat in line with Sharp et al. (2014) who found that appearance comparisons did not play a significant role when examining the relationship between media exposure, body dissatisfaction and attitudes to cosmetic surgery. Further research with a larger sample size is required to replicate the current findings, and to more fully understand the role of internalisation of beauty ideals and appearance comparisons within the context of cosmetic surgery advertising.

Implications for Health Psychology and Major Contributions

The findings of the current study have some important practical implications. Exposure to the cosmetic surgery advertisements had no impact upon women's body image state or cosmetic surgery intentions, relative to exposure to beauty product advertising. However, exposure to cosmetic surgery and beauty product advertisements with models did increase state body dissatisfaction. This study therefore adds to the compelling evidence base that exposure to idealised media images negatively impacts women's body image (e.g., Grabe et al., 2008). Given that body dissatisfaction is associated with increased risk for disordered eating (Stice, 2002), depression (Paxton, Neumark-Sztainer, Hannan & Eisenberg, 2006) and self-harm (Muehlenhamp & Brausch, 2012) a number of public health initiatives are emerging around the world to tackle the negative impact of idealised media images on body image (Paxton, 2015). For example, in Israel it is now illegal to use models in advertising and fashion with a body mass index of less than 18.5

(Paxton, 2015). In addition, the British Government support the 'Body Confidence Awards' which recognise and reward positive body image initiatives carried out by industry, including the advertising, media and beauty sectors (Government Office, 2013). As a result of these awards, Boots, a company that sells cosmetics, won an award for their decision to stop using airbrushed models in their advertisements and Debenhams, a retailer, won an award for using models with a diversity of appearance (Paxton, 2015).

In relation to the cosmetic industry, the UK government's review of cosmetic interventions recommended that a new ethical code of practice for advertising standards should be created, in part, to combat the use of potentially misleading images in advertisements that can be digitally altered and consequently depict an unrealistic result (Department of Health, 2013). The British Association of Plastic Reconstructive and Aesthetic Surgeons (BAPRAS) support the notion of a code of advertising practice to protect consumers from irresponsible and potentially misleading advertisements. In line with this recommendation and given the findings from this study, an initial step towards better regulation of cosmetic surgery advertising could be to consider regulations on the inclusion of models in cosmetic surgery advertisements. However, a continuing need for more research is required to investigate the impact of cosmetic surgery advertisements.

Whilst the current study was an important first step, replication and additional research assessing the impact of exposure to cosmetic surgery advertisements is required within the field of health psychology. Additional research, in line with the Prevention Maturation Schema framework (Austin, 2012; Sallis et al., 2000), will help continue to build an evidence base to inform recommendations regarding the regulation of cosmetic surgery advertising. For example, research is needed to examine the impact of risk perception and specific marketing strategies, such as discounts and special offers. Furthermore, given that exposure to cosmetic surgery and beauty product advertisements

with models did increase state body dissatisfaction, the potential longer-term negative consequences if women are regularly and repeatedly exposed to this type of advertising must also be examined. In addition, whilst experimental and correlational studies are critical to the uptake of public health initiatives, public support is also crucial to their success. Therefore consumer opinion in relation to cosmetic surgery advertisements and regulation should be an important consideration (Puhl, Neumark-Sztainer, Austin, Luedicke, & King, 2014). It has become apparent that research within the field of cosmetic surgery warrants further attention and focus in health psychology, particularly given the potential for serious physical and psychological harm.

A major contribution of this study is that it is the first to experimentally examine the impact of short-term exposure to cosmetic surgery advertisements on women's body image and cosmetic surgery intentions. Indeed, this study was conducted at a time when research is needed to help inform decisions concerning regulations on cosmetic surgery advertisements. Indeed, experimental research is critical prior to the roll out of policy interventions. For example, within the broader body image field a popular social policy approach to ease the negative impact of exposure to idealised media images was to include a disclaimer (i.e., a warning or label) on digitally altered media images. This strategy was promoted by various advocacy groups (e.g., Girlguiding UK) and recommended by the British All Party Parliamentary Group on Body Image (APPG, 2012). However, in contrast to advocates' beliefs about the positive impact of including a disclaimer on airbrushed images, the vast majority of experimental evidence found that disclaimers do not ameliorate the negative impact of exposure to idealised media images on women's body image (Ata et al., 2013, Tiggemann et al., 2013; Tiggemann, Slater & Smyth, 2014). Although one study found some benefits (Slater, Tiggemann, Firth & Hawkins, 2012), a further study found that exposure to certain types of disclaimers increased body

dissatisfaction for women high in appearance comparison tendencies (Tiggemann et al., 2013). This example emphasises the importance of experimental research in developing a robust evidence base that can inform the most appropriate and effective policy guidelines and recommendations.

A further strength of this study is the use of a community sample of women providing a less restricted sample than the majority of studies to date which have focused on female undergraduate students. A community sample takes into consideration the range of women exposed to such advertisements and the findings are therefore more generalisable. Indeed cosmetic surgery advertisements have a population wide reach (Austin, 2012). As people presenting for cosmetic surgery are increasingly diverse (Department of Health, 2013), examining whether a certain demographic (e.g., men or younger/older individuals) and more ethnically diverse samples are more susceptible to the exposure of such advertisements will be important.

Limitations

Future research could improve on the current study in a number of ways. Specifically, the methodology used in this study to expose participants to advertisements does not reflect most real life situations (for example, glimpsing at an advertisement while interacting with friends, or walking past a billboard), which may impact on how individuals respond to advertising. In addition, whilst every effort was made to replicate genuine advertisements found in the media, future studies may benefit from exposing participants to professional advertisements. Furthermore, the online nature of the study may have some limitations. Participants were not supervised during the study. Factors, such as technical issues with the computer or the conditions under which participants were responding (e.g., watching television or talking to a friend/work colleague at the same time

as completing the study), may have impacted the level of attention paid to the stimuli. However, measures were put in place in an attempt to reduce these potential problems, for example, study instructions emphasised the importance of completing the study in one sitting and a recall task was put in place to ascertain participants' attention to the advertisements. Results of the recall task indicated that participants were indeed attending to the advertisements. Furthermore, the replication of the common finding that women exposed to advertisements featuring models had greater body dissatisfaction than those exposed to advertisements without models increases confidence in the validity of the current findings. Nonetheless, future research may benefit from adopting more controlled settings.

In addition, this research only examined the immediate short term effects of exposure to the different advertisement conditions. The findings from this experimental study do not discount the notion that the cumulative effect of exposure to cosmetic surgery advertisements may increase intentions to have cosmetic surgery and worsen body image.

Finally, this research only focused on women. Whilst women account for the vast majority of the population who present for cosmetic surgery, the number of men undergoing cosmetic procedures is steadily increasing (BAAPS, 2015). As men are equally exposed to advertisements, it is important that future research considers the impact of exposure to cosmetic surgery advertisements on men's body image and intentions to undergo cosmetic surgery.

Conclusion

To conclude, this is the first study to experimentally examine the impact of brief exposure to cosmetic surgery advertisements on women's state body image and cosmetic surgery intentions. The results demonstrate that exposure to advertisements featuring

models negatively effects women's state body image in comparison to viewing advertisements without models. However, exposure to advertisements featuring cosmetic surgery products does not appear to be more detrimental to body image than advertisements featuring less invasive and permanent beauty products. Brief exposure to cosmetic surgery and beauty product advertisements does not appear to increase cosmetic surgery intentions at least in the short-term. Furthermore, internalisation of beauty ideals and appearance comparisons did not moderate these effects. Further experimental research is needed to replicate these findings and to extend our understanding of the impact of cosmetic surgery advertisements, in order to guide policy makers towards the most effective strategies involving this form of advertising.

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Appendices

Appendix A: Systematic Review

Risk Factors for Negative Body Image among Children: A systematic review of Experimental and Longitudinal Studies.

ABSTRACT

Research shows that negative body image is prevalent among preadolescent children. Given the serious health outcomes associated with negative body image, including low self esteem and eating disorders, it is important to identify the risk factors. This article provides the first extensive systematic review of studies examining risk factors for the development of negative body image in children. Twenty relevant articles were identified (15 longitudinal and five experimental studies) providing 10 potential risk factors; body mass, socio-cultural influences (media, peer, parental) and individual characteristics (self esteem, negative affect, depressed mood, perfectionism, autonomy and appearance schemas). A narrative synthesis was conducted and the findings provided mixed evidence for the impact of these risk factors. Increased body mass, peer teasing, parental and media influences all significantly predicted aspects of negative body image. There was less evidence concerning individual characteristics. Implications for prevention programmes are discussed and recommendations for future research are provided.

INTRODUCTION

Body image refers to how individuals think, feel and behave in relation to their appearance and body (Thompson, Heinberg, Altabe & Tantleff-Dunn 1999). Negative body image is defined by negative perceptions of one's physical appearance and can encompass a range of constructs including body dissatisfaction, weight and shape concern and muscle dissatisfaction (Wertheim & Paxton, 2011). A large body of evidence now stipulates that

individuals with higher levels of negative body image are at a greater risk for developing a number of serious public health problems including depression (Stice & Bearman, 2001), low self esteem (Paxton, Eisenberg & Neumark-Sztainer, 2006) and disordered eating (Neumark-Sztainer, Wall, Guo et al, 2006). Although it is widely acknowledged that adolescence is the crucial time at which negative body image is heightened; it is very likely that the foundations of negative body image are laid much earlier in childhood (Clark & Tiggemann, 2008).

Research shows that negative body image is evident in very young children with some studies finding children as young as 6 years old displaying body dissatisfaction (Dohnt & Tiggemann, 2004). Studies typically report that about 40-50% of children are dissatisfied with some aspect of their body (Smolak, 2011). Girls usually want to be thinner and boys worry about being too small and too heavy (Ricciardelli, McCabe, Mussap, & Holt, 2009; Wertheim, Paxton, & Blaney, 2009). Although most research to date has focused on negative body image in girls there is evidence to suggest that the risk factors for the development of negative body image may be similar for boys (Paxton et al, 2006; McCabe & Ricciardelli, 2003). This review will therefore examine the risk factors for the development of negative body image in both girls and boys. It is necessary to identify empirically based risk factors for this age group in order to confidently target these in prevention programs before children reach adolescence when negative body image becomes normative.

A risk factor is a variable that significantly increases the chances of a detrimental outcome, such as negative body image (Smolak, 2009; Stice et al, 2002). To identify a *causal* risk factor it must show temporal precedence to the outcome variable (Kraemer, 1997). This requires longitudinal studies that have controlled for initial levels of body image (i.e., the outcome variable). In addition a causal risk factor can be demonstrated using experimental

methodology; whereby manipulating the levels of the risk factor will significantly alter the level of the outcome variable (Kreamer, 1997). This review will only include longitudinal studies that have controlled for initial body image outcomes and experimental studies.

Theoretical models

Research suggests that the same factors that lead to the development of negative body image in adolescents' and adults have been found with children. The theoretical models used to explain the development of negative body image in children are therefore similar to those used with older samples (Smolak, 2011). Socio-cultural theories are often used to explain the development of negative body image (Smolak & Levine, 2001). Socio-cultural influences include the mass media, peer and parental influences and are widely acknowledged to play a crucial role in determining children's standards of beauty (Tiggemann, 2005). The mass media (e.g. television), including toys (e.g. Barbie) portrays an overrepresentation of unrealistic appearance ideals that emphasise the importance of the thin ideal for girls (by promoting thinness), the muscular ideal for boys (by promoting leanness and muscularity) and emphasising the importance of attractiveness (Smolak, 2011). Exposure to the thin- and muscular-ideal images depicted in the media has been found in both experimental and longitudinal studies to consistently contribute to the development of negative body image (Dittmar, Halliwell & Ive, 2006; Grabe, Hyde & Ward, 2008). Parents and peers can have an impact on a child's body image. Children may model their parent's or peers' behaviours and attitudes relating to body weight and shape (i.e., dieting). In addition, parents and peers can also make comments about the child's body shape and give subtle messages about their appearance (Smolak, 2011). Teasing or appearance-related criticism can also have a detrimental impact on an individual's body image (Keery, Boutelle, van den Berg & Thompson, 2005; Neumark-Sztainer, Bauer, Friend et al., 2010).

Other potential risk factors that contribute to the development of negative body image include biological and physical factors such as body mass index (BMI). Negative body image can develop when an individual's body shape and size do not fit in with the culturally defined norms of attractiveness (Wertheim et al, 2009). Increased body mass deviates the individual away from these ideals of beauty and can therefore contribute to the development of negative body image (Littleton and Ollendick, 2003).

Individual characteristics can also help explain why some individuals are at a higher risk for developing negative body image. These include cognitive, personality and psychological processes such as placing high value on thinness (thin internalisation), negative affect and self esteem (Wertheim, Paxton, & Blaney, 2004).

Multi-factorial models are used to explain how factors interact to contribute to the development of negative body image. The Tripartite Model of Influence (Thompson, Coovert,& Stormer, 1999) is a well researched and supported model for the development of negative body image among adults and adolescents (Keery et al 2005; Shroff & Thompson, 2006). However, in order to gain a better understanding of the impact of biological, socio-cultural, and individual influences on the development of negative body image, many studies have explored these factors separately. This review will therefore examine all risk factors located in the search as independent agents, in order to derive conclusions about which risk factors are important in the development of negative body image among children.

Measuring negative body image

The majority of body image researchers use a range of measures to capture the different components of body image. In this review the majority of included studies provided more than one measure to assess negative body image (for example, body esteem, muscle

preoccupation, drive for thinness, and drive for muscularity). This is in order to gain further insight into the different constructs (Blond, 2008). For example, one study found that appearance teasing predicted body esteem attrition, but not body esteem weight or appearance (Lunde, Frisen & Hwang, 2007). Omitting one of these outcome variables would exclude important information from this review and therefore data from all relevant body image outcomes were included.

Aims

To the author's knowledge, the literature examining the experimental, prospective and longitudinal development of negative body image in children has never been synthesised. This review is therefore important because current understanding about risk factors for children's body image is limited and relies heavily on findings from cross-sectional studies in which you cannot infer causality (Ricciardelli & McCabe, 2001). The first aim of this review is to increase our understanding of the risk factors for the development of negative body image in children by using longitudinal and experimental studies. The second aim is to discuss the practical implications of the results from this review in terms of body image prevention and intervention programmes. The third aim to identify gaps in the literature in an attempt to promote future research in these particular areas.

METHODS

Search strategy for identification of studies

This systematic review was conducted in accordance with the procedures outlined in the Cochrane Handbook for Systematic Reviews (Higgins & Green, 2009). To obtain research that is relevant for this review a number of search strategies were conducted. First, ten computerised databases were searched; MEDLINE (1975-May 2012) EBSCO (1947-May

2012), OVID (1946-June 2012), CINAHL (1947-May 2012), AMED (1947-May 2012), Wiley Online Library (1999- June 2012), ERIC (1975-May 2012), The Cochrane library, Web of Knowledge (1950-June 2012) and PsycINFO (1947-May 2012) supplemented with searches on Google scholar. These databases were chosen to ensure maximum coverage of the literature. The following search terms with truncations were used*: "Body image", "negative body image", "body dissatisfaction", "body satisfaction", "body ideals", "children", "pre –teen", "pre-adolescent", "young", "paediatric", "elementary", "longitudinal", "prospective", and "experimental"*. In order to reduce the likelihood of publication bias, the search was not restricted by date, language or publication status. In addition, body image researchers were identified and contacted directly by the lead author in an attempt to obtain recent or unpublished studies. Second, one journal shown to produce high numbers of relevant studies was hand searched (*Body Image: An international Journal of Research*). Third, the reference lists of all included studies were examined for studies that met the inclusion criteria. Finally, citations of all of the included studies were checked in order to identify further relevant studies.

Inclusion and exclusion criteria for selecting studies for this review

Inclusion and exclusion criteria were applied to titles and abstracts. Full length articles were retrieved for the studies that appeared to meet the criteria or where there was inadequate information to be sure.

Studies were excluded on the basis of any of the following criteria; (a) the article did not describe an empirical study; (b) the article did not report the findings of a primary study or secondary analysis; (c) the article was not published in English. Only studies that were written in English were included in the review, although there was no restriction on the countries in which the studies were conducted; (d) the article used cross sectional,

retrospective or qualitative methodology; (e) the article did not contain a measure of body image; (f) the article did not measure a possible risk factor; (g) participants were a high risk sample (i.e., preselected based on a clinical diagnosis); (h) participants were not within the traditional definition of childhood (1-12 years of age). If the age range extended beyond these boundaries, the average age must be between 1 and 12 years or the data must be analysed separately for this age group; and (i) the article did not demonstrate temporal precedence. All longitudinal studies had to control for baseline levels of the outcome measure. In addition, the experimental studies were only included if they had a control group.

Data extraction

Data was extracted from all identified studies by two reviewers (the first and second author) using a standardised data extraction form. This form was supplemented with specific questions related to the focus of this review and the methods used. The data from studies were extracted according to study type (longitudinal, prospective, experimental), the focus of the study, the country in which the research was conducted and the study population (e.g., gender, age range, mean age). Data extraction also captured information on participant recruitment, the validity and reliability of measures used, potential confounding variables, attrition rate, data collection methods and statistical analysis (p value, confidence intervals, odds ratio, beta values, t values, F values, r values). For studies that included multiple follow up assessments, data was only extracted from the longest follow up period as this is considered to be a more methodologically rigorous design (Ricciardelli, McCabe, Lillis & Thomas, 2006).

Assessing the methodological quality of studies

The methodological quality of each study was assessed independently by two reviewers (the first and the second author) following the principles set out for appraising primary studies in Systematic Reviews by the Centre for Reviews and Dissemination (2009). Any disagreements among reviewers were resolved in a consensus meeting.

A standardised checklist of 13 predefined quality criteria was used to assess the longitudinal studies. This was a modified version of the checklists used by Kuijpers et al (2004) and Luppino et al (2010). The criteria were based on those proposed by Wong et al (2008) for assessing the quality of correlational research. The checklist covers aspects of internal and external validity, bias (attrition and reporting), generalisability, reporting, confounding variables and data collection and analysis (Altman, 2001, Wong et al 2008). The experimental studies were quality assessed using the Evidence for Policy and Practice Information and Co-ordinating Centre's modified version of the Cochrane tool for intervention evaluation studies (O'Mara-Eves, Brunton, McDaid, 2012). The quality assessment covers aspects of selection bias, attrition bias, selected reporting bias, experimental allocation and type of control.

Studies were not assigned a numerical quality score as these are often misleading (Juni, Witschi, Bloch et al., 1999). Instead the methodological quality of the included studies will be discussed and compared throughout the review based on the criteria described above.

Statistical analysis

A narrative synthesis was conducted due to the heterogeneity of included studies (in terms of their methodology, follow up periods and measures). This meant quantitative synthesis through meta-analysis was not appropriate.

RESULTS

Results of the search

The initial search identified 5209 references, after the removal of duplicates, 3048 references were excluded in the preliminary screen as irrelevant (Fig. 1, Appendix A). The remaining 1325 abstracts were double reviewed and 76% were excluded. The reasons are provided in Fig.1. In total, 324 full length papers were obtained and the review procedure led to a final sample of 20 articles that met the inclusion criteria comprising of 15 longitudinal studies and 5 experimental studies from 13 different journals. This resulted in the inclusion of samples from six countries (England, United States, Australia, Sweden, Belgium, The Netherlands) and resulted in a total of 12,996 participants; 7361 girls and 5034 boys. The mean age reported in the studies ranged from 4.4 to 10.59 years at baseline. For the longitudinal studies, the duration of the follow up ranged from 10 months to 48 months and retention rates varied from 70% to 97%. A summary of characteristics for the longitudinal studies can be found in Table 1. A summary of characteristics for the experimental studies can be found in Table 5 on page 13. For a detailed list of the risk factor measures please refer to Appendix B.

Table 1. Summary of characteristics for the longitudinal studies: risk factors and negative body image.

Author and country	Follow up from baseline(months)	Participants			Response rates		Risk Factors	BI/BD outcome	Measure (validated)	Y-yes N-No
		Age at baseline	No in analysis	Sex	Baseline	Follow- up. (Attrition rate %)				
Allen et al (2008) Australia	12	8-13	132 127	F M	277	259 (94)	BM, ME , PA, SE, DM	BD BDist WSC O	CBIS CBIS ChEDE ChEDE	Y Y Y Y
Clark et al (2008) Australia	12	10.28	150	F	214	150 (70)	BM, ME, A, AS	DFT BE	CFRS BES	Y Y
Davison et al (2010) USA	24	9.34	138	F	183	177 (97)	PA	WC	WCS	Y
Dohnt et al (2006) Australia	12	6.91	97	F	128	97 (76)	BM, ME, PE, SE	DFT AS	CFRS PF	Y N
Ericken et al (2003) USA	12	9.67 9.84	47 58	F M	-	-	BM, PA	BD	CFRS	Y
Field et al (2001) USA	12	9-14	4966 3662	F M	9039 7843	7299 (81) 5653 (72)	BM, ME, PE, PA	BD	MRFS	Y
Goossens et al (2012) Belgium	12	9.05	601	M/F	688	601 (87)	PA	WC SC	ChEDE ChEDE	Y Y

Harrison & Bond (2007) USA	12	8.77	181	M	-	-	ME	DFM PBS	DMS PS-P	N N
Harrison & Hefner (2006) USA	12	8.72	257	F	-	-	ME	PBS CBI FBI	CFRS CFRS PS-F	Y Y N
Lunde et al (2007) Sweden	36	10.36	474 400	F M	960	874 (91%)	BM, PE	BE (App/Att/We)	BESAA	N
McCabe et al (2005) Australia	16	9.24 9.26	201 193	F M	507	461 (91)	BM, ME, PE, PA	MD MI* WD WI*	SIQ-PB SIQ-PB SIQ-PB SIQ-PB	N N N N
Ricciardelli et al (2006) Australia	16	9.25	199	M	237	199 (84)	BM, PA, SE, NA	BD MI* WI*	CFRS SIQ-PB SIQ -PB	Y N N
Salafia et al (2011) USA	12	10.59	85	F	102	85 (83)	PE, PA	BD	EDI	N
Saling et al (2005) Australia	10	9.14 9.24	150 176	F M	326	275 (85)	BM,PE, PA,SE, NA, P	MP	ChEAT BCI	Y N
Shunk et al (2004) USA	48	5.4	153	F	197	153 (78)	BM	BD WC	BES WCS	Y N

Follow up from baseline. Sex; F=female, M=male, M/F =mixed (number not reported separately for males and females). *did not supply complete information therefore the numbers included in the analyses are less.

Risk Factors: BM=Body mass, ME=media, PE=Peers, PA=Parental, SE=Self Esteem, NA=Negative Affect, DM=Depressed Mood, P=Perfectionism, A=Autonomy, AS=Appearance Schemas.

BD/BI Outcomes: BD=Body Dissatisfaction, BDist=Body distortion, WSC=Weight and Shape concern, O=Overvaluation, DFT=Drive for thinness, BE=Body Esteem appearance/attrition/weight, AS=Appearance Satisfaction, WC=Weight concerns, SC=Shape concerns, DFM=Drive for Muscularity, PBS=Perceived Body Shape, CBI=Current body ideal, FBI=Future Body Ideal, MP=Muscle Preoccupation, MI=Muscle importance, WI=Weight importance

Measures: CBIS=The Children's Body Image Scale (Truby & Paxton, 2002), ChEDE= Children's Eating Disorder Examination Questionniare (Bryant-Waugh et al, 1996)PF=Pictorial Format, MRFS=McKnight Risk Factor Survey (Shisslak et al, 1999), DMS=Drive for Muscularity Scale (McCreary & Sasse, 2000), CFRS-Children's Figure Rating Scale (Collins, 1991),PS-F=Pictorial Scale-Female adults (Stunkard et al, 1983) BESAA=Body Esteem Scale for Adolescents and Adults (Mendelson et al, 2001), CFD= Children Figure Drawings (Collins, 1991), SIQ-PB=Single item question purpose built (Ricciardelli et al, 2003), EDI =Eating Disorders Inventory Body Dissatisfaction subscale (Garner, 1984), ChEAT = The Children's Eating Attitudes Test (Smolak & Levine, 1994), BCI =Body Change Inventory (Ricciardelli & McCabe, 2002), BES=Body Esteem Scale (Mendelson & White, 1982) WCS=Weight Concern Scale (Killen et al 1994).

*How important to you is the size of your muscles

*How important to you is your weight?

*How happy are you with your weight

*How happy are you with your muscle size

Risk Factors

Ten risk factors were identified from the search. The results section is structured to review each risk factor among girls and then boys.

Elevated body mass

In all of the studies Body Mass Index (BMI) was calculated by measuring participant's height and weight and then computing BMI using the formula: BMI = Kg/m^2 . The validity and reliability of BMI for use in children has been confirmed (Dwyer and Gibbons, 1994).

Girls:

Nine out of the fifteen longitudinal studies (60%) reviewed body mass index as a risk factor for negative body image in young girls (Table 2) with one study including both boys and girls (Allen et al., 2008). The studies found that elevated levels of body mass predicted subsequent increases in body dissatisfaction at 12 month follow up (Field, Camargo, Taylor et al., 2001; Allen, Byrne, McLean et al., 2008; Clark et al., 2008; Ericksen, Markey & Tinsley, 2003), 36 month follow up (Lunde et al., 2007) and 48 month follow up (Shunk & Birch, 2004) with the average age at baseline ranging from 5.4 years (Shunk et al., 2004) to 10.36 (Lunde et al., 2007). Increased body mass also prospectively predicted the desire for thinness (Dohnt et al., 2006, Clark et al., 2008) and increased weight concern in young girls (McCabe & Ricciardelli, 2005; & Shunk et al., 2004). However, some of these findings were not replicated. Allen et al (2008) found that BMI did not predict weight and shape concerns in 8-13 year olds at 12 month follow up. This could be explained by a floor effect on weight and shape concerns as almost 50% of their participants scored zero on this measure suggesting that for this sample, weight and shape related concerns only affected the minority. Body mass did not predict global appearance

satisfaction (Dohnt et al., 2006) and there was also conflicting evidence concerning muscle dissatisfaction (Saling, Ricciardelli & McCabe, 2005; McCabe et al., 2005). The measures used to assess muscularity were not validated and may in part explain these discrepancies. BMI did not predict Body Esteem-Attribution (the belief about others opinions of their body shape), however, Lunde et al (2007) found that girls aged 10 who perceived themselves as being too heavy (irrespective of their actual body mass) were significantly more body dissatisfied three years later (partial r = -.099, beta -.11, $p < .05$, $F = 7.15$, P <.001).

Although there are some inconsistencies with certain aspects of body image, collectively this evidence suggests that body mass is a risk factor for the development of negative body image in girls with the majority of findings consistent across different age groups (7 – 10.36 years) and time periods (10 – 46 months).

Table 2. Initial elevated body mass and subsequent negative body image (BI) in girls; summary of results

Author	**BI Outcome**	**Main findings**	**p**
Allen et al., 2008	BD	Higher BMI significantly predicted increased body dissatisfaction with children desiring a smaller body at 12 months follow up. BMI accounted for 12% variance in T2 dissatisfaction. F(2,229)= 61.19. Partial r^2 .12	.001
	BDist	Higher BMI significantly predicted body distortion at 12 month follow up. BMI accounted for 5% variance in T2 body distortion. F(2,229) = 18.64, Partial r^2 -.05	.001
	WSC	BMI did not significantly predict weight and shape concern at 12 months follow up.	-
Clark et al., 2008	DFT	Girls with a larger BMI at Time 1 were more likely to desire a thinner body at 12 month follow up. Beta .18, R2 change .022, F change 4.65	.05
	BE	Girls with a higher BMI at Time 1 had poorer body esteem at 12 month follow up. Beta -.16, R2 change .021, F change 4.40	.05
Dohnt et al., 2006	DFT	Heavier girls at Time 1 were more likely to desire a thinner body at 12 month follow up. Beta .27, R2 change .06, F change 7.19.	.05

	AS	No significant associations between BMI at Time 1 and the development of appearance satisfaction at 12 month follow up.Beta -.16, R2 change .02, F change 2.39	-
Ericksen et al 2003	BD	Girls with larger BMI at Time 1 were significantly more likely to develop body dissatisfaction at 12 month follow up. r =.45, Beta .73, S.E.*B* .08, *B* .30	.01
Field et al., 2001	BD	Elevated body mass at baseline predicted subsequent increases in body dissatisfaction at 12 month follow up OR 1.2-1.4, 95% CI 1.1-1.3	.01
Lunde et al 2007	BE-App	Heavier girls at baseline (10.36 years) displayed greater body dissatisfaction with general appearance at 36 month follow up (Partial r = -.012) Beta -.12, *B* -.04, R2 change .02, *F* = 11.41, P < .001.	.05
	BE-Att	BMI did not significantly contribute to the development of BE-Att three years later. Beta -.03, *B* -.01.	-
	BE - We	Higher level of BMI at age 10 was negatively related to body weight dissatisfaction three years later (partial r = -.24) Beta -.22, *B* -.10, R2 change .05, *F* = 23.79, P <.001.	.001
McCabe et al 2005	WD	Girls with a higher BMI at baseline were significantly more likely to report weight dissatisfaction 16 months later. Beta .28, t-value 3.61	.001
	WI	Girls with a higher BMI at baseline were significantly more likely to report weight importance 16 months later. Beta .19, t-value 2.48	.01
	MD	BMI did not prospectively predict muscle dissatisfaction for girls. Beta .10, t-value 1.25	-
	MI	BMI did not prospectively predict muscle importance for girls. Beta .04, t-value .47	-
Saling et al., 2005	MP	Higher scores on BMI significantly predicted muscle preoccupation 10 months later. Beta 0.31, R2 Change .12, p<.01.	.001
Shunk et al,. 2004	BD	Girls with a higher BMI at aged 5 had significantly higher levels of body dissatisfaction by the age of 9. F =13.27	.001
	WC	Girls with a higher BMI at aged 5 had significantly higher levels of weight concern by the age of 9. F=17.03	.0001

Boys

Six longitudinal studies specifically examined the influence of body mass index on preadolescent boys' negative body image (Table 3). Findings indicated that higher initial levels of body mass predicted prospective body dissatisfaction at 12 months (Field et al., 2001 & Ericken et al., 2003) and 16 month follow up (Ricciardelli et al., 2006). Higher

BMI predicted greater importance placed on muscles at 16 months (McCabe et al., 2005, Ricciardelli, et al., 2006) but had no impact on muscle dissatisfaction or preoccupation. Similar to the findings with girls, the impact of BMI on concerns with muscularity for boys is inconsistent. This may be due in part to the lack of validated measures used and the reliance on single item measures. In contrast to the girls, Lunde et al., (2007) found that body mass did not predict body esteem for the boys. Instead Lunde et al., (2007) found that boys who believed they were too heavy-built at the age of 10 were significantly more dissatisfied with their general appearance (partial r = -.13), body esteem attribution (partial r = -.099) and weight related aspects of their body esteem (partial r = -.21) three years later. This emphasises the importance of taking into account young boys' own perceptions about their weight. Body mass did not predict prospective weight or shape concerns in any of the included studies (Ricciardelli et al, 2006 & McCabe et al, 2005).

Overall, there were fewer studies examining body mass as a risk factor for negative body image in boys and the findings present a mixed picture. BMI seems to be a risk factor for body dissatisfaction and muscle importance aspects of body image but not for body esteem, weight importance or dissatisfaction and muscle preoccupation or dissatisfaction.

Table 3. Elevated body mass at baseline and subsequent negative body image in boys; summary of results

Author	**BI Outcome**	**Main findings**	**P**
Ericken et al., 2003	BD	Boys with larger BMI at baseline, mean age 9.84 years, were significantly more likely to develop body dissatisfaction at 12 month follow up. r=.63, Beta .52, S.E.*B*.04, *B*.16	.01
Field et al., 2001	BD	Increased body mass predicted subsequent increases in body dissatisfaction at 12 month follow up. OR 2.2 -2.6 95% CI 1.7-3.0	.001

Lunde et al., 2007	BE-App	BMI was not significantly associated with body esteem appearance three years later. Beta -.06, *B* .02	-
	BE-Att	BMI was not significantly associated with body esteem attribution three years later. Beta .01, *B* .00	-
	BE-We	BMI was not significantly associated with weight related body dissatisfaction three years later. Beta -.03, *B* -.01	-
McCabe., 2005	WD	BMI did not prospectively predict weight dissatisfaction at 16 month follow up. Beta .11, t-value 1.38	-
	WI	BMI did not prospectively predict weight importance at 16 month follow up. Beta .04, t-value .50	-
	MD	BMI did not prospectively predict muscle dissatisfaction at 16 month follow up. Beta .06, t-value .63	-
	MI	Higher BMI was associated with increased muscle importance at 16 month follow up. Beta -.22, t-value -2.62	.01
Ricciardelli et al., 2006	BD	A higher BMI was associated with higher levels of body dissatisfaction 16 months follow up. Beta 0.36, R2 Change 0.15, p<.001	.001
	WI	BMI was not significantly associated with weight importance at 16 month follow up. Beta 0.00, R2 Change 0.10, p<.001	-
	MI	A lower BMI significantly predicted the greater importance placed on muscles at 16 month follow up. Beta -0.17, R2 Change 0.10, p<.001	.05
Saling et al., 2005	MP	BMI did not significantly predict muscle preoccupation at 10 months follow up. Beta -0.03	-

Socio-cultural influences

The mass media

Girls

Six longitudinal studies examined the impact of the media on the development of negative body image in young girls (Table 4). Media influence was measured in multiple ways including perceived pressure to look like the images seen in the media (Field et al, 2001, McCabe et al, 2005), media exposure (Harrison & Bond, 2006, Dohnt et al, 2006) and awareness and internalisation of the media ideal (Allen et al, 2008 & Clark et al, 2008).

Perceived pressure from the media to lose weight at 9.24 years old was found to significantly increase weight and muscle importance in young girls 16 months later (McCabe et al, 2005). Girls aged 9-14 years who reported making a lot of effort to look like the same sex figures in the media were more likely to be dissatisfied with their body 12 months later (Field et al, 2001). Perceived messages from the media to increase muscles had no impact on prospective weight or muscle dissatisfaction or importance (McCabe et al, 2005).

The findings on the longitudinal effects of media exposure are mixed. Higher levels of self reported television viewing at baseline, aged 8-12 years, was associated with a thinner future body ideal one year later but not a current ideal body (Harrison et al, 2006). Similarly, increased viewing of appearance focused television in a younger sample aged 5-8 years old was associated with decreased appearance satisfaction one year later (Dohnt et al, 2006) but not a desire for thinness. In addition, self-reported magazine exposure to different genres including health and fitness, fashion and sports, had no long term impact on current or future body ideals (Harrison et al., 2006). The majority of studies fail to provide adequate information on the content of the media viewed and rely heavily on self report measures. All of these studies used samples from Australia restricting the generalizability of these findings to other Western populations.

Greater awareness and internalisation of the media ideal at ages 8-13 and 10.28 at baseline predicted greater weight and shape concerns, desire for thinness and body esteem at 12 month follow up (Allen et al, 2008 & Clark et al, 2008) but not body dissatisfaction or body overvaluation (Allen et al, 2008).

In summary, the heterogeneity of the types of media influence examined and the different components of body image assessed makes it difficult to draw any firm conclusions about

the role of the media as a risk factor for negative body image among girls from the longitudinal studies.

Table 4. The influence of the mass media on negative body image in girls; summary of results

Author	BI Outcome	Media Measure	Main findings	P
Allen et al.,2008	WSC	MMIS	Girls reporting greater media influences aged 8-13 years at baseline had greater weight and shape concerns at 12 month follow up. t(231) =2.11, p<.05, beta = .48	.05
	O	MMIS	Media influences did not significantly predict overvaluation at 12 month follow up.	-
	BD	MMIS	Media influences did not significantly predict body dissatisfaction at 12 month follow up.	-
Clark et al.,2008 **Australia**	DFT	IMIS	Girls with greater internalisation of the media ideals at baseline had a greater desire for a thin body at 12 month follow up. Beta .20, R2 Change .034, F change 7.29	.01
	BE	IMIS	Girls with greater internalisation of media ideals at baseline had poorer body esteem at 12 month follow up. Beta -.21, R2 Change .028, F change 6.19	.05
Dohnt et al.,2006	DFT	ATE	Initial appearance television exposure did not significantly predict desire for thinness at 12 month follow up. Beta -.05, R2 Change .002, F change 0.23	-
	AS	ATE	Initial appearance television exposure predicted a decrease in appearance satisfaction at 12 month follow up. Beta -.24, R2 Change .06, F change 5.85	.05
Field et al., 2001	BD	MRFS	Girls who reported making a lot of effort to look like the same sex figures in the media were more likely to become dissatisfied with their body at 12 month follow up OR:1.9; 95% CI:1.1-3.1)	.05
Harrison, et al., 2006	CBI	T.V exposure	Exposure to T.V at baseline did not significantly predict current body ideals at 12 month follow up. Beta -0.06	-
	CBI	Magazine exposure	Exposure to magazines at baseline did not significantly predict current body ideals at 12 month follow up.	-
	FBI	T.V exposure	Increased television viewing at baseline was significantly associated with the prospective desire to be thinner 12 months later. Beta -0.14, R2 Change 0.01	.05
	FBI	Magazine exposure	Exposure to magazines at baseline did not significantly predict future body ideals at 12 month follow up.	-
McCabe et	WD	SIBIBCQ	Perceived pressure from the media to lose weight did not predict weight	-

al., 2005			dissatisfaction at 16 month follow up. Beta -.05, t-value .53	
	WD	SIBIBCQ	Perceived pressure from the media to increase muscles did not predict weight dissatisfaction at 16 month follow up. Beta .14, t-value 1.43	-
	WI	SIBIBCQ	Perceived pressure from the media to lose weight was associated with increased weight importance at 16 month follow up. Beta -.19, t-value -2.01	.01
	WI	SIBIBCQ	Perceived pressure from the media to increase muscles did not predict weight importance at 16 month follow up. Beta .02, t-value .21	-
	MD	SIBIBCQ	Perceived pressure from the media to lose weight did not predict muscle dissatisfaction at 16 month follow up. Beta -.05, t-value -.46	-
	MD	SIBIBCQ	Perceived pressure from the media to increase muscles did not predict muscle dissatisfaction at 16 month follow up. Beta .13, t-value 1.20	-
	MI	SIBIBCQ	Perceived pressure from the media to lose weight was associated with increased muscle importance at 16 month follow up. Beta -.26, t-value -2.71	.01
	MI	SIBIBCQ	Perceived pressure from the media to increase muscles did not predict muscle importance at 16 month follow up. Beta .08, t-value .73	-

Experimental research (Table 5) has provided some evidence that brief exposure to the media ideals can impact young girls body image (Dittmar & Halliwell, 2006, Anschutz, Spruijt-Metz, Van Strien et al., 2011), although two studies found no impact (Anschutz & Engels 2010; Hayes & Tantleff-Dunn, 2010) and one study found the opposite effect (Anschutz, Engels & Van Strien, 2012). Dittmar et al,(2006) found that girls experienced increased body dissatisfaction after exposure to Barbie doll images and this effect was larger in girls aged 6.5 -7.5 years. Girls over the age of 7.5 reported a greater desire to be thin when adults after exposure to a picture of a realistically sized doll. However in a replication study, girls' body esteem and actual-ideal body size discrepancy was not significantly changed after playing with thin dolls in comparison to an average sized doll (Anschutz et al, 2010). The studies differed in their type of media exposure with Dittmar et al (2006) exposing girls to images of Barbie whereas Anschutz et al (2010) gave girls real Barbies to play with.

Hayes et al, (2010) found that animated video clips containing appearance related messages did not affect body dissatisfaction in very young girls aged 3-6 years old. Anschutz (2011) found that older girls aged 11-12 years showed an increase in body dissatisfaction after watching a thin ideal television clip. However 10-11 year olds showed lower body dissatisfaction after watching the thin ideal television clip and body image in girls aged 9-10 years did not change.

Girls who internalised the thin ideal were more satisfied with their body after exposure to thin ideal characters than after exposure to characters (animated or real) with no ideal features (Anschutz, 2012).

Table 5. Experimental exposure to media ideals for girls; summary of characteristics and results

Author/date/location	**Experimental condition**	**Control conditions**	**Age**	**Outcome (validated)**	**No**	**Main Findings**
Anschutz et al., 2012 The Netherlands	Thin ideal animated characters	1.Animated non thin children's programme 2.Real non thin ideal children's programmes	6-8	Body Satisfaction VAS (N)	51	High levels of thin ideal internalisation showed higher body satisfaction after exposure to the thin ideal than after exposure to either control condition F (1,47) = 4.00, p=0.05, r=0.28.
Anschutz et al, 2011 The Netherlands	Video clip focusing on the thin ideal Duration: 20 minutes	1. Contained thin models but no explicit focus on the thin ideal (soap opera) 2.Neutral in content (migratory birds)	9-11	Body dissatisfaction CFRS (Y)	60	Body dissatisfaction significantly differed by age groups between the thin ideal television clip condition and neutral condition F (2,55) =8.28, p=.001, n2=0.23. Girls aged 11.18 years showed greater body dissatisfaction when they were exposed to the thin ideal television clip than when exposed to the neutral television clip. Girls aged 10.05 years showed opposite effect and girls aged 9-10 years had equal body dissatisfaction over conditions.

Anschutz et al., 2010 The Netherlands	Play with thin doll (Barbie and Tyler) for 10 minutes	1.Average sized doll- Emme doll, 2.Lego - control	8.04	Body Esteem Actual-Ideal Body Size Discrepancy BES (N)	117	Body esteem did not differ between the three conditions F(2, 110)=.24, P=.71, Cohen's F =.08 The same findings were found for body size discrepancy.
Dittmar et al., 2006 UK	Images of thin Barbie doll in picture book for 15 minutes	1.Images of Emme doll 2.Control – neutral pictures without bodies	5-8	Body esteem R-BES (Y) Body shape dissatisfaction CFRS Adult ideal body shape FRS	162	For girls aged 5.5-6.5 years; Barbie doll exposure significantly worsens overall body esteem (beta -.29, .05),increases actual- ideal body size discrepancies (beta -.21, .05) and girls desire more extreme thinness after seeing Barbie doll images than after seeing other images. No impact on adult ideal body shape. For girls aged 6.5- 7.5 years; Barbie doll exposure decreases body esteem (beta-.41, .05), increases actual-ideal dissatisfaction in direction of wanting to be thinner (beta-.29, .05) and discrepancy between actual and ideal body when adult (beta-.30, .01) desire more thinness when older. For girls aged 7.5-8.5 years; Barbie doll exposure has no direct effect on body image. A negative effect of exposure to the Emme doll was found (beta -.23, .05) resulting in an increased discrepancy between actual and adult body size with girls desiring a more extreme thin body size when grown up.
Hayes et al.,2010 USA	Video of appearance related clips from animated children's movies containing appearance related	1.Control – neutral montage of clips from 7 animated films that did not contain any appearance related	4.44	Behavioural observation -appearance versus non appearance related behaviours (N)	121	Results failed to reveal any differences between the exposure conditions. There were no differences in body image or appearance related behaviours.

	messages	messages	
	Duration 14 minutes		Appearance satisfaction – VAS (N) Body dissatisfaction CFRS

The evidence from the experimental research is mixed and needs to be interpreted with caution due to various limitations. The evidence relies heavily on the work conducted by one author introducing the potential for bias (Anschutz et al., 2010, 2011, 2012). Only one study explicitly stated that random allocation was conducted (Hayes et al, 2010) and two studies used a within-subjects design. Although a within-subjects design reduces the potential problem of individual differences confounding a between-subjects design, there is a higher risk for carry over effects and experimental fatigue. The experimental media exposure studies only measured the short term effect of thin ideal media influence on body image. It is therefore unclear from these studies if these effects continue over time. In addition, these experimental designs do not take into consideration the daily bombardment of media images. It therefore seems plausible that the experimental data underestimates the power of these media images on young girls' body image (Smolak, 2011).

Boys

Four longitudinal studies examined the effects of the media on boys' body image (Table 6). Similar to the girls, the included studies measured different aspects of media influence making it difficult to draw comparisons. Field et al (2001) found that, like the girls, boys who reported making a lot of effort to look like same sex figures in the media were more likely to become dissatisfied with their body. McCabe et al (2005) found that perceived

pressure from the media to lose weight predicted weight dissatisfaction in boys and that perceived pressure from the media to increase muscles predicted the importance placed on weight (McCabe et al, 2005). Boys' body image tends to be influenced by both perceived messages from the media about weight and muscle. However, perceived messages from the media did not predict boys' muscle dissatisfaction or importance.

Harrison & Bond (2007) found that white boys who reported reading more gaming magazines displayed a greater drive for muscularity one year later whereas Black boys who reported reading more gaming magazines at baseline reported having a heavier body shape prospectively. In contrast, reading fashion, health and fitness and sports magazines had no impact on boys' body dissatisfaction (Harrison et al., 2007).

In comparison to the girls in this study, Allen (2008) found that media influence did not significantly predict weight and shape concerns in boys suggesting that there is a potential gender difference here. However, like girls, body dissatisfaction and overvaluation in boys was not significantly predicted by media influence.

Table 6. The influence of the mass media on prospective negative body image in boys; summary of results

Author	BI Outcome	Media Measure	Main findings	P
Allen et al., 2008 (8-13)	WSC	MMIS	Media influences did not predict weight and shape concern in boys at 12 month follow up t(231) =.26, p =8.0, beta =.02	-
	BD	MMIS	Media influences did not predict body dissatisfaction at 12 month follow up.	-
	O	MMIS	Media influence did not predict overvaluation at 12 month follow up.	-
Field et al., 2001 (9-14)	BD	MRFS	Boys who reported making a lot of effort to look like the same sex figures in the media were more likely to become dissatisfied with their body at 12 month follow up. OR:2.7; 95% CI:1.1-6.4)	.05
Harrison et al., 2007	DFM	Magazine exposure	Magazine exposure at baseline did not prospectively predict drive for masculinity at 12 month follow up for Black boys (n = 104)	-

(8.77)				
	PBS	Magazine exposure	Black boys who reported reading more gaming magazines at baseline reported having a significantly heavier body shape at 12 month follow up. Beta .17, t(101)=2.03	.05
	DFM	Magazine exposure	White boys who reported reading more gaming magazines at baseline displayed a significantly greater drive for muscularity 1 year later (n=77), beta .26, R2 Change .10, p<.05	.01
	PBS	Magazine exposure	Gaming magazine exposure at baseline did not prospectively predict perceived thinness/adiposity at 12 month follow up for White boys. Beta .02, t(76)=0.21	-
McCabe et al., 2005	WD	SIBIBCQ	Perceived pressure from the media to lose weight significantly predicted increased weight dissatisfaction 16 months later. Beta .17, t-value 1.92	.05
	WD	SIBIBCQ	Perceived pressure from the media to increase muscles did not predict weight dissatisfaction at 16 month follow up. Beta .01, t-value .10	-
	WI	SIBIBCQ	Perceived pressure from the media to lose weight did not predict weight importance at 16 month follow up Beta .01 t-value .15	-
	WI	SIBIBCQ	Media muscles 16 months Beta .21, t-value 2.31	.05
	MD	SIBIBCQ	Perceived pressure from the media to lose weight did not predict muscle dissatisfaction at 16 month follow up Beta .01, t-value .07	-
	MD	SIBIBCQ	Perceived pressure from the media to increase muscles did not predict muscle dissatisfaction at 16 month follow up. Beta -.08, t-value -.81	-
	MI	SIBIBCQ	Perceived pressure from the media to lose weight did not predict muscle importance at 16 month follow up Beta .10, t-value 1.01	-
	MI	SIBIBCQ	Perceived pressure from the media to increase muscles did not predict muscle importance at 16 month follow up. Beta .10, t-value .97	-

Collectively, there is some evidence that media messages and images influence boy's body image. However, the findings from the longitudinal studies, irrespective of sample size or length of follow up are inconsistent and only based on four studies.

Peer influences:

Girls:

Six longitudinal studies examined the association between peer influences and negative body image in girls (Table 7). Peer influences were operationalised in a number of ways

including peer modelling, positive peer relations and peer teasing. Fours studies examined the impact of peer modelling, i.e., perceived peer pressure to be thin or lose weight. Field et al (2001) found that the importance of thinness to peers, did not predict body dissatisfaction. Likewise, McCabe et al., (2005) found that perceived peer influence to lose weight or gain muscles did not predict girls body dissatisfaction 16 months later. In contrast, Dohnt et al., (2006) found that perceived peer desire for thinness predicted a significant increase in girls' own desire for thinness and decreases in appearance satisfaction one year later. Likewise, Salafia & Gondoli, (2011) found that both direct pressure to be thin and indirect discussion of dieting from peers in fifth grade (10.59 years, SD = 0.52) were strongly related to girls' body dissatisfaction in sixth grade and in fact found peers to be a stronger influence than mothers and fathers.

A single study examined positive peer relations. Saling et al., (2005) found that muscle preoccupation was significantly predicted by higher scores on the peer relations measure suggesting that more positive peer relationships predicted high muscle preoccupation.

Finally, one study conducted in Sweden looked at the impact of peer teasing on negative body image. Lunde et al., (2007) found that a higher frequency of age 10 exposure to peer victimisation (for example, teasing and social exclusion) prospectively predicted girls' lower levels of weight related body esteem (partial r =-.15) although appearance teasing specifically did not predict body esteem. It is unclear however what the peer victimisation consisted of i.e., weight or something else as the authors did not measure this.

Table 7. Peer influences on prospective negative body image in girls; summary of results

Author	**BI Outcome**	**Peer influences Measure**	**Main findings**	**P**
Dohnt et al., 2006	DFT	CFRS	Girls who initially believed their peers desired a thinner ideal body subsequently wanted to be thinner themselves 1 year later Beta .27, R2	.05

			Change .06, F change 6.12.	
	AS	CFRS	Girls who initially thought their peers desired a thin body were subsequently less satisfied with their appearance 1 year later. Beta -.32, R2 Change .11, F change 9.79	.01
Field et al., 2001	BD	MRFS	The importance of thinness to peers did not predict the development of body dissatisfaction in girls 12 months later. OR 1.5; 95% CI:.3-7.3	-
Lunde et al., 2007	BE-App	VI	Peer victimization experiences at age 10 had no prospective influence on general appearance at a 36 month follow up. Beta .04, *B* .11,R2 Change .01, *F* = 19.17, P< .001	-
	BE-Att	VI	Peer victimization experiences at age 10 had no impact on girls' beliefs about how others view their appearance prospectively. Beta .06, *B* .12,R2 Change .00, *F* = 10.60, P <.001	-
	BE-We	VI	Peer victimization experiences at age 10 were not significantly related to girls long term weight related body esteem. Beta .09, *B* .27,R2 Change .02, *F* =35.86, P<.001	-
	BE-App	TVS	Peer victimization experiences at age 10 had no prospective influence on general appearance. Beta -.08, *B* -.04, R2 Change .01, *F* =19.17, P<.001	-
	BE-Att	TVS	Peer victimization experiences at age 10 had no impact on girls' beliefs about how others view their appearance prospectively. Beta -.03, *B* -.02,R2 Change .00, *F* = 10.60, P <.001	-
	BE-We	TVS	A higher exposure to peer victimization reported on the victim scale at age 10 prospectively predicted girls' lower levels of weight related body esteem. Beta -.16, *B* -.10,R2 Change .02, *F* =35.86, P<.001	.001
	BE-App	AT	Appearance teasing experiences at age 10 had no long term influence on girls' satisfaction with their general appearance. Beta .01, *B* .03, R2 Change .01, *F* = 19.17, P< .001	-
	BE-Att	AT	Appearance teasing experiences at age 10 had no long term influence on girls' beliefs about how others view their appearance. Beta -.03, *B* -.09, R2 Change .00, *F* = 10.60, P <.001	-
	BE -We	AT	Appearance teasing experiences at age 10 were not significantly related to girls long term weight related body esteem Beta -.04, *B* -.20, R2 Change .02, *F* =35.86, P<.001	-
McCabe et al., 2005	WD	SIBIBCQ	Perceived pressure from friends to lose weight did not predict weight dissatisfaction over 16 months. Beta -.05, t-value -.51	-
	WD	SIBIBCQ	Perceived messages from friends to increase muscles did not predict weight dissatisfaction over 16 months. Beta .14, t-value -1.12	-
	WI	SIBIBCQ	Perceived pressure from friends to lose weight did not predict weight importance at16 months follow up. Beta -.07, t-value-.88	-

	WI	SIBIBCQ	Perceived messages from friends to increase muscles did not predict weight importance at 16 months follow up. Beta -.05, t-value -.60	-
	MD	SIBIBCQ	Perceived pressure from friends to lose weight did not predict muscle dissatisfaction over 16 months Beta .06, t-value -.75	-
	MD	SIBIBCQ	Perceived messages from friends to increase muscles did not predict muscle dissatisfaction at 16 months follow up. Beta -.15, t-value -1.50	-
	MI	SIBIBCQ	Perceived pressure from friends to lose weight did not predict muscle importance over 16 months Beta -.08, t-value -1.00	-
	MI	SIBIBCQ	Perceived messages from friends to increase muscles did not predict muscle importance at 16 months follow up. Beta .07, t-value .77	-
Salafia et al., 2011	BD	MRFS	Direct pressure from peers to be thin in fifth grade (10.59 years) was strongly related to girls' body dissatisfaction 12 months later. Path coefficient .54	.05
	BD	PDD	Peer discussion of dieting in fifth grade (10.59 years) was strongly related to girls' body dissatisfaction 12 months later. Path coefficient .49	.05
Saling et al., 2005	D	PR-SDQ-1	Peer relations did not predict dieting at 10 month follow up. Beta 0.06, R2 0.52, P<.001	-
	MP	PR-SDQ-1	Higher scores on peer relations significantly predicted muscle preoccupation at 10 months follow up. Beta 0.33, R2 Change .12, p<.01	.001

Overall, the longitudinal findings concerning the effect of peer modelling and peer teasing on negative body image during childhood are inconsistent (Field et al., 2001, McCabe et al., 2005, Dohnt,et al., 2006 & Salafia et al., 2011, Lunde et al., 2007). In addition there is some evidence to support the importance of positive peer relations, however this is based on the findings of a single study (Saling et al, 2005). More prospective research is needed to address the influence of peers on body image.

Boys

Four longitudinal studies examined the impact of peer influences on boys' negative body image (Table 8). Two studies explored the impact of peer modelling. Field (2001) found that peer importance of not being fat was not predictive of becoming body dissatisfied in boys 12 months later. Similarly, McCabe et al (2005) found that perceived messages from

friends to lose weight or increase muscles in boys aged 9.26 years did not predict weight or muscle dissatisfaction or importance in boys 16 months later.

A single study examining the impact of positive peer relations failed to find an effect on muscle preoccupation at 10 month follow (Saling et al, 2005) .This study however, used a relatively short follow up period reducing the power of the analyses (Leon, Fulkerson, Perry et al, 1999).

Finally peer teasing and victimisation was examined in one study. Appearance teasing significantly predicted body esteem attrition in Swedish boys (Lunde et al, 2007). Frequently occurring appearance teasing at the age of 10 was significantly associated with lower levels of boys body esteem attribution three years later (partial r = -.11). The author noted that appearance teasing may be linked to long term beliefs about how others view them. Interestingly, appearance teasing did not predict body esteem weight or body esteem appearance in boys. Likewise, exposure to bullying and higher levels of peer victimisation did not prospectively predict body esteem for boys (Lunde et al, 2007).

Table 8. Peer influences on prospective negative body image for boys; summary of results

Author	**BI Outcome**	**Peer influences Measure**	**Main findings**	**P**
Field et al., 2001 (9-14)	BD	MRFS	The importance of not being fat to peers did not predict the development of body dissatisfaction in boys 12 months later. OR 1.2; 95% CI:.4-3.8	-
Lunde et al 2007 (10.36)	BE-App	VI	Peer victimization experiences at age 10 had no prospective influence on general appearance 36 months later. Beta .08, *B* .19,R2 Change .01, *F* = 12.65, P< .001	-
	BE-Att	VI	Peer victimization experiences at age 10 had no prospective influence on boys' beliefs about how others view their appearance prospectively. Beta .02, *B* .06,R2 Change .01, *F* = 9.44, P< .001	-
	BE-We	VI	Peer victimization experiences at age 10 had no prospective influence on boys' weight related body esteem. Beta -.09, *B* .24,R2 Change .01, *F* = 20.02, P< .001	-
	BE-App	TVS	Peer victimization experiences at age 10 had no prospective influence on general appearance. Beta -.08, *B* -.03,R2 Change .01, *F* = 12.65, P< .001	-

	BE-Att	TVS	Peer victimization experiences at age 10 had no prospective influence on boys' beliefs about how others view their appearance prospectively. Beta -.03, *B* -.01,R2 Change .01, *F* = 9.44, P< .001	-
	BE-We	TVS	Peer victimization experiences at age 10 had no prospective influence on boys' weight related body esteem. Beta -.03, *B* -.01, R2 Change .01, *F* = 20.02, P< .001	-
	BE-App	AT	Appearance teasing experiences at age 10 had no prospective influence on boys' general appearance. Beta -.03, *B* -.12, R2 Change .01, *F* = 12.65, P< .001	-
	BE-Att	AT	A higher exposure to appearance teasing at the age of 10 was significantly associated with lower levels of body esteem attrition three years later. Beta -.11, *B* -.43, R2 Change .01, *F* = 20.02, P< .001	.05
	BE-We	AT	Appearance teasing experiences at age 10 had no prospective influence on boys' weight related body esteem. Beta -.03, *B* -.14, R2 Change .01, *F* = 20.02, P< .001	-
McCabe et al, 2005 (9.26)	WD	SIBIBCQ	Perceived pressure from friends to lose weight did not predict weight dissatisfaction over 16 months Beta .05, t-value .63	-
	WD	SIBIBCQ	Perceived messages from friends to increase muscles did not predict weight dissatisfaction over 16 months Beta .05, t-value .52	-
	WI	SIBIBCQ	Perceived pressure from friends to lose weight did not predict weight importance over 16 months Beta .11, t-value 1.28	-
	WI	SIBIBCQ	Perceived messages from friends to increase muscles did not predict weight importance over 16 months Beta -.06, t-value -.61	-
	MD	SIBIBCQ	Perceived pressure from friends to lose weight did not predict muscle dissatisfaction over 16 months Beta .02, t-value .18	-
	MD	SIBIBCQ	Perceived messages from friends to increase muscles did not predict muscle dissatisfaction over 16 months Beta .01, t-value .13	-
	MI	SIBIBCQ	Perceived pressure from friends to lose weight did not predict muscle importance over 16 months Beta -.05, t-value -.52	-
	MI	SIBIBCQ	Perceived messages from friends to increase muscles did not predict muscle importance over 16 months Beta .08, t-value .82	-
Saling et al.,2005 (9.24)	D	PR- SDQ-1	Peer relations did not predict dieting at 10 months follow up. Beta -0.12, R2 Change 0.06, p<.01	-
	MP	PR- SDQ-1	Peer relations did not predict muscle preoccupation at 10 month follow up. Beta -0.03, R2 0.23, p< 0.00	-

There are several methodological problems that hinder the ability to draw any firm conclusions. First there are a small number of longitudinal studies examining the relationship between peer influence and body image in boys. Second, the four included

studies focus on different aspects of peer influence making it difficult to compare the findings. The evidence provided indicates that perceived messages from peers do not predict body dissatisfaction or weight dissatisfaction (Field et al, 2001, McCabe et al, 2005). Positive peer relations do not predict muscle preoccupation (Saling et al, 2005), however, appearance teasing significantly predicts body esteem attrition 36 months later, but not body esteem weight or appearance (Lunde et al, 2007). It is interesting to note that the study with the longest follow up of 36 months (Lunde et al, 2007) was the only study to find an effect on body image, implying that future studies should use longer follow up periods to increase the power of the analyses.

Parental influences:

Girls

Eight longitudinal studies investigated parental influences on the development of negative body image in girls (Table 9). Similar to media and peer influences, parental influence was measured in multiple ways using a host of different body image measures. Five studies examined the impact of parental comments. Mothers' and fathers' direct encouragement to lose weight and indirect discussion about dieting in fifth grade girls aged 10.59 years were related to body dissatisfaction in sixth grade (Salafia et al, 2011). Likewise, Field et al, (2001) found that perceived pressure from either parent to be thin predicted increases in body dissatisfaction in girls suggesting that parental influences were predictive of becoming highly concerned with weight. Davison & Deane (2009) found that girls aged 9.34 years whose parents encouraged them to be active for weight loss reported higher prospective concern about weight two years later aged 11. In addition, McCabe et al (2005) found that perceived messages from mothers to lose weight significantly predicted weight dissatisfaction and perceived messages from father to increase muscles predicted the

importance of weight among young girls. Interestingly these messages relate to both weight loss as well as increased muscle, which may suggest that girls are striving for a slim, toned body.

Two studies examined the prospective impact of parental relationships on body image. Goossens, Braet, Durme et al (2012) found that girls and boys who reported a less secure attachment towards their mother, but not their father, significantly predicted increases in children's shape and weight concerns one year later. Being female was predictive for significantly higher increases in weight concerns at follow up than boys (beta .08, t = 2.13, R2 Change .02, $p<.05$). However, Saling et al (2005) found that positive parent relations did not longitudinally predict girls dieting or muscle preoccupation. Finally, Ericksen et al (2003) found that girls' body dissatisfaction was not related to their mothers or fathers self reported body dissatisfaction.

Table 9. Parental influence on prospective negative body image in girls; summary of results

Author	**BI Outcome**	**Parental influence measure**	**Main findings**	**P**
Allen et al., 2008	WSC	CFOWS	Overweight related comments about weight or shape did not significantly predict weight and shape concern 12 months follow up.	-
	BD	CFOWS	Overweight related comments about weight or shape did not significantly predict body dissatisfaction at 12 month follow up.	-
	O	CFOWS	Overweight related comments about weight or shape did not significantly predict overvaluation at 12 month follow up.	-
	BDist	CFOWS	Overweight related comments did not significantly predict body distortion at 12 month follow up.	-
Davison et al., 2009	WC	EPAWL	Increased parental encouragement for weight loss at age 9 significantly increased girls' weight concerns 24 months later. Beta .27, t-value 2.65	.01
Ericksen et al., 2003	BD	Mothers BD	Mothers self reported body dissatisfaction did not significantly predict boys' body dissatisfaction at 12 month follow up. Beta -.26, S.E. *B* .37, *B*-.44	-
	BD	Fathers	Fathers self reported body dissatisfaction did not significantly predict boys'	-

		BD	body dissatisfaction at 12 month follow up. Beta -.02, S.E. *B*.19, *B* -.02	
Field et al.,2001	BD	MRFS	Girls who reported that it was important to either parent that they were thin were significantly more likely to become dissatisfied with their bodies 12 months later OR:2.1; 95% CI:1.1-4.0	.05
Goossens et al 2012	WC	SS	Perceptions of a less secure attachment towards their mother significantly predicted increases in children's weight concerns 12 months later. Beta -.13, t = -3.46,	.001
	SC	SS	Perceptions of a less insecure attachment towards the mother significantly predicted increases in children's shape concerns 1 year later. Beta -.08, t = -2.28,	.05
	WC	SS	Perceived attachment towards the father did not significantly predict children's weight concern 1 year later. Beta -.03, t = -.92	-
	SC	SS	Perceived attachment towards the father did not significantly predict children's shape concern 1 year later. Beta -.05, t = -1.41	-
McCabe et al 2005	WD	SIBIBCQ	Perceived pressure from mothers to lose weight significantly predicted weight dissatisfaction 16 months later. Beta=.26, t-value 2.69	.01
	WD	SIBIBCQ	Perceived pressure from fathers to lose weight did not predict weight dissatisfaction over 16 months Beta -.17, t-value -.1,78	-
	WD	SIBIBCQ	Perceived messages from mothers to increase muscles did not predict weight dissatisfaction over 16 months Beta -.10, t-value-1.11	-
	WD	SIBIBCQ	Perceived messages from fathers to increase muscles did not predict weight dissatisfaction over 16 months Beta .02, t-value .26	-
	WI	SIBIBCQ	Perceived pressure from mothers to lose weight did not predict weight importance over 16 months. Beta .18, t-value 1.85	-
	WI	SIBIBCQ	Perceived pressure from fathers to lose weight did not predict weight importance over 16 months Beta .09, t-value .88	-
	WI	SIBIBCQ	Perceived messages from mothers to increase muscles did not predict weight importance over 16 months Beta -.05, t-value -.52	- 0
	WI	SIBIBCQ	Perceived messages from fathers to increase muscles significantly predicted weight importance over 16 months beta .22, t value 2.28,	.05
	MD	SIBIBCQ	Perceived pressure from mothers to lose weight did not predict muscle dissatisfaction over 16 months Beta .07, t-value .72	-
	MD	SIBIBCQ	Perceived pressure from fathers to lose weight did not predict muscle dissatisfaction over 16 months Beta -.13, t-value -1.22	-
	MD	SIBIBCQ	Perceived messages from mothers to increase muscles did not predict muscle dissatisfaction over 16 months Beta -.02, t-value -.21	-
	MD	SIBIBCQ	Perceived messages from fathers to increase muscles did not predict muscle dissatisfaction over 16 months Beta .18, t-value 1.72	-
	MI	SIBIBCQ	Perceived pressure from mothers to lose weight did not predict muscle	-

			importance over 16 months Beta .09, t-value .87	
	MI	SIBIBCQ	Perceived pressure from fathers to lose weight did not predict muscle importance over 16 months Beta .07, t-value .67	-
	MI	SIBIBCQ	Perceived messages from mothers to increase muscles did not predict muscle importance over 16 months Beta .13, t-value 1.27	-
	MI	SIBIBCQ	Perceived messages from fathers to increase muscles did not predict muscle importance over 16 months Beta .12, t-value 1.21	-
Salafia et al., 2011	BD	FHES	Direct encouragement from mothers to lose weight in fifth grade (10.59) was significantly related to girls' body dissatisfaction 12 months later. Path coefficients .23	.05
	BD	PDD	Mothers' discussion of dieting in fifth grade was significantly related to girls' body dissatisfaction 12 months later. Path coefficients .23	.05
	BD	FHES	Direct encouragement from fathers to lose weight in fifth grade was significantly related to girls' body dissatisfaction 12 months later. Path coefficients .36	.05
	BD	PDD	Fathers' discussion of dieting in fifth grade was significantly related to girls' body dissatisfaction 12 months later. Path coefficients .38	.05
Saling et al., 2005	D	PR-SDQ-1	Parental relations did not significantly predict dieting in girls at 10 months follow up. Beta 0.01, R2 0.52, p< .001	-
	MP	PR-SDQ-1	Parental relations did not significantly predict muscle preoccupation at 10 month follow up. Beta 0.10, R2 Change .12, p<0.01	-

To summarise, there is some convincing evidence to suggest that parental comments prospectively predicted girl's negative body image at 12, 16 and 24 month follow up with the majority of these studies reporting these effects for both mothers and fathers. The two studies examining the impact of parental relationships on girl's body image found conflicting results (Goossens et al , 2012 & Saling et al, 2005) suggesting more research is needed in this area.

Boys

Six studies examined the influence of parents on boy's negative body image (Table 10). There is some longitudinal evidence to suggest that both mothers and fathers influence their son's body image. Ericksen et al (2003) found that fathers self reported body

dissatisfaction was associated with boy's prospective body dissatisfaction and McCabe et al., (2005) found that perceived messages from mothers to increase muscles predicted muscle dissatisfaction in boys longitudinally. However, Field et al (2001) found that boy's prospective body dissatisfaction was unrelated to the perceived importance to their mother or the father that they should not be fat. Similar to girls, Saling et al., (2005) found that positive parental relations did not prospectively predict muscle preoccupation in boys aged 9.24 years.

Table 10. Parental influence on prospective negative body image in boys; summary of results

Author	**BI Outcome**	**Parental influence measure**	**Main findings**	**P**
Allen et al., 2008	WSC	CFOWS	Overweight related comments did not significantly predict weight and shape concern at 12 months follow up.	-
	BD	CFOWS	Overweight related comments did not significantly predict body dissatisfaction at 12 month follow up.	-
	O	CFOWS	Overweight related comments did not significantly predict overvaluation at 12 month follow up.	-
	BD	CFOWS	Overweight related comments did not significantly predict body distortion at 12 month follow up.	-
Ericken et al.,2003	BD	Mothers BD	Mothers self reported body dissatisfaction did not significantly predict boys' body dissatisfaction at 12 month follow up. Beta .08, S.E. *B*.14, *B* .08	-
	BD	Fathers BD	Fathers self reported body dissatisfaction significantly predicted increases in boys' body dissatisfaction at 12 month follow up. (r= .37, p <.01) Beta .27, S.E.*B* .09, *B* .22	.05
Field et al., 2001	BD	MRFS	The importance of not being fat to both parents was unrelated to the development of body dissatisfaction 12 months later OR:.6; 95% CI:.2-1.5	-
McCabe et al., 2005	WD	SIBIBCQ	Perceived pressure from mothers to lose weight did not predict weight dissatisfaction over 16 months Beta -.04, t-value -.41	-
	WD	SIBIBCQ	Perceived pressure from fathers to lose weight did not predict weight dissatisfaction over 16 months Beta .00, t-value .06	-
	WD	SIBIBCQ	Perceived messages from mothers to increase muscles did not predict weight dissatisfaction over 16 months Beta .15, t-value 1.60	-

	WD	SIBIBCQ	Perceived messages from fathers to increase muscles did not predict weight dissatisfaction over 16 months Beta .00, t-value .00	-
	WI	SIBIBCQ	Perceived pressure from mothers to lose weight did not predict weight importance over 16 months Beta -.02, t-value -.20	-
	WI	SIBIBCQ	Perceived pressure from fathers to lose weight did not predict weight importance over 16 months Beta .04, t-value .44	-
	WI	SIBIBCQ	Perceived messages from mothers to increase muscles did not predict weight importance over 16 months Beta -.07, t-value -.76	-
	WI	SIBIBCQ	Perceived messages from fathers to increase muscles did not predict weight importance over 16 months Beta .12, t-value 1.29	-
	MD	SIBIBCQ	Perceived pressure from mothers to lose weight did not predict muscle dissatisfaction over 16 months Beta -.08, t-value -.81	-
	MD	SIBIBCQ	Perceived pressure from fathers to lose weight did not predict muscle dissatisfaction over 16 months Beta -.11, t-value -1.14	-
	MD	SIBIBCQ	Perceived messages from mothers to increase muscles significantly predicted muscle dissatisfaction over 16 months Beta .21, t-value 2.05	.05
	MD	SIBIBCQ	Perceived messages from fathers to increase muscles did not predict muscle dissatisfaction over 16 months Beta .10, t-value 1.00	-
	MI	SIBIBCQ	Perceived pressure from mothers to lose weight did not predict muscle importance over 16 months Beta .03, t-value .33	-
	MI	SIBIBCQ	Perceived pressure from fathers to lose weight did not predict muscle importance over 16 months Beta .03, t-value .37	-
	MI	SIBIBCQ	Perceived messages from mothers to increase muscles did not predict muscle importance over 16 months Beta -.05, t-value -.51	-
	MI	SIBIBCQ	Perceived messages from fathers to increase muscles did not predict muscle importance over 16 months Beta .14, t-value 1.44	-
Ricciardelli et al., 2006	BD	SIBIBCQ	Perceived pressure to lose weight from a combination of sources (mother, father, best friend and the media) at baseline did not predict body dissatisfaction 16 months later. Beta -0.02, R2 Change 0.15, p<.001	-
	WI	SIBIBCQ	Perceived pressure to lose weight at baseline did not predict weight importance 16 months later. Beta 0.11, R2 0.17, p<.001.	-
	MI	SIBIBCQ	Perceived pressure to lose weight at baseline did not predict muscle importance 16 months later. Beta 0.07, R2 Change 0.10, p<.001	-
	BD	SIBIBCQ	Perceived pressure to increase muscles from a combination of sources (mother, father, best friend and the media) at baseline did not predict body dissatisfaction 16 months later. Beta 0.05, R2 Change 0.15, p<.001	-
	WI	SIBIBCQ	Higher levels of perceived pressure to increase muscles at baseline significantly predicted greater weight importance 16 months later. Beta 0.17, R2 0.17, p<.001	.05
	MI	SIBIBCQ	Higher levels of perceived pressure to increase muscles at baseline significantly predicted greater muscle importance 16 months later. Beta	.01

			0.22,R2 Change 0.10, p<.001	
Saling et al., 2005	D	PR-SDQ-1	Positive parental relations did not significantly predict dieting at 10 month follow up. Beta 0.01, R2 Change 0.06, p<0.01	-
	MP	PR-SDQ-1	Positive parental relations did not significantly predict muscle preoccupation at 10 month follow up. Beta -0.07, R2 0.23, p<0.00	-

Perceived pressure to increase muscles and lose weight did not predict body dissatisfaction in boys (Ricciardelli et al, 2006). Similarly, perceived pressure to lose weight had no impact on prospective weight or muscle dissatisfaction. In contrast, perceived pressure to increase muscles was a significant long term predictor of weight importance and muscle importance in boys. However, the measure used in this study combines perceived pressure from mother, father, media and best friend so it is impossible to say what the strongest socio-cultural predictor is (Ricciardelli et al., 2006). Similarly, Allen et al (2008) looked at the impact of overweight related comments from a number of sources including parents, friends and the media and combined them together to form a measure of sociocultural influences. The authors found that this did not significantly predict weight and shape concern, body dissatisfaction, overvaluation or body distortion in a mixed sample of girls and boys.

Individual characteristics

Low self esteem

Girls

Three longitudinal studies examined the influence of low self esteem on the development of negative body image in girls (Table 11). The findings from the longitudinal studies are mixed with the majority of findings not providing evidence for a relationship between self esteem and the development of negative body image (Dohnt et al, 2006, Saling et al, 2005, Allen et al, 2008). However, Saling et al (2005) found that lower self esteem predicted

muscle preoccupation 10 months later and Allen et al (2008) found that low self esteem prospectively predicted weight and shape concern in girls 12 months later. Both studies used measures validated for use with preadolescents. However the studies all used Australian samples restricting the generalizability of these findings.

Table 11. Low self esteem and prospective negative body image in girls; summary of results

Author	BI Outcome	Self Esteem Measure	Main findings	P
Allen et al., 2008	WSC	GSWS-SPPC	Low self esteem at baseline significantly predicted girls weight and shape concern at 12 month follow up t(231) = -5.80, p<.01 beta = -.45.	.01
	BD	GSWS-SPPC	Self esteem did not significantly predict body dissatisfaction at 12 months follow up.	-
	O	GSWS-SPPC	Self esteem did not significantly predict overvaluation at 12 month follow up.	-
Dohnt et al., 2006	DFT	GSWS-SPPC	Self esteem at baseline (6.91 years) did not significantly predict change in desire for thinness at 12 month follow up. Beta -.07, R2 Change .004	-
	AS	GSWS-SPPC	Self esteem at baseline did not significantly predict appearance satisfaction at 12 month follow up. Beta .21, R2 Change .04	-
Saling et al., 2005	D	GS – SDQ-I	Self esteem did not significantly predict dieting at a 10 month follow up. Beta 0.03, R2 0.52, p<0.001	-
	MP	GS – SDQ-I	Lower self esteem scores at the age of 9 significantly predicted muscle preoccupation at a 10 month follow up. Beta -0.19, R2 Change .12, p<0.01	.05

Boys

Three longitudinal studies examined the influence of low self esteem on prospective body dissatisfaction in boys (Table 12). Results from the small number of studies do not provide support for a relationship between low self-esteem and the development of negative body image (Allen et al, 2008, Saling et al, 2005, Ricciardelli et al, 2006). None of the included studies found self esteem to prospectively predict body dissatisfaction. These findings were consistent across the different lengths of follow up (10, 12 and 16 months), different ages

at baseline and despite the studies using validated and non-validated measures of self esteem.

In sum, self esteem was found to predict muscle preoccupation and weight and shape concern in girls but not boys providing some insight into possible gender differences (Allen et al, 2008, Saling et al, 2006). The measures used in these studies however may not be sensitive enough to accurately measure self esteem in young children, particularly boys.

Table 12. Low self esteem and prospective negative body image in boys; summary of results

Author	BI Outcome	Self Esteem Measure	Main findings	P
Allen et al., 2008	WSC	GSWS-SPPC	Self esteem did not predict weight and shape concern at 12 month follow up: t(231)=1.11, p = .26, beta =.09	-
	BD	GSWS-SPPC	Self esteem did not prospectively predict body dissatisfaction at 12 month follow up.	-
	O	GSWS-SPPC	Self esteem did not prospectively predict overvaluation at 12 month follow up.	-
Ricciardelli et al, 2006	BD	SDQ-I	Self esteem did not predict body dissatisfaction at 16 month follow up Beta -0.09, R2 Change 0.15, p<.001	-
	WI	SDQ-I	Self esteem did not predict weight importance at 16 month follow up. Beta 0.00, R2 0.17, p<.001	-
	MI	SDQ-I	Self esteem did not predict muscle importance at 16 month follow up. Beta 0.05, R2 Change 0.10, p<.001	-
Saling et al., 2005	D	GS-SDQ-I	Self esteem did not predict dieting at a 10 month follow up. beta -0.13, R2 Change 0.06, p<0.01	-
	MP	GS-SDQ-I	Self esteem did not predict muscle preoccupation at 10 month follow up. Beta -0.01, R2 0.23, p<0.00	-

Due to the small number of studies examining the prospective influence of individual differences on body image they have been summarized together in Table 13.

Negative affect

Girls and boys

Only two prospective studies were found that addressed the relationship between negative affect and body image. Despite using a validated outcome measure, Saling et al (2005) found that negative affect did not predict boys' prospective muscle preoccupation. In comparison, higher reported negative affect predicted muscle preoccupation in girls (Saling et al, 2005). Similarly, Ricciardelli et al., (2006) found that for boys aged 9.25 years, negative affect did not significantly predict body dissatisfaction or weight or muscle importance at 16 months follow up using a purpose built, single item measure. A possible explanation for these results may be the lack of sensitive scales used because both studies reported a low variance in children's negative affect scores (Ricciardelli et al 2006 & McCabe et al, 2009). This was particularly true of the boys (Ricciardelli, McCabe et al 2009).

Depressed mood

The single longitudinal study to measure depressed mood found that depressive mood did not predict weight and shape concern, body dissatisfaction, body distortion or overvaluation in boys or girls (Allen et al, 2008).

Perfectionism

The single longitudinal study found that higher perfectionism scores at baseline predicted greater muscle preoccupation in preadolescent boys but not girls (Saling et al, 2005).

Autonomy

Lower autonomy predicted a greater desire for thinness but not body esteem for girls (Clark et al, 2008). This was the only study examining this risk factor and replication is needed before firm conclusions can be drawn.

Appearance schemas

The finding that the development of appearance schemas was temporally antecedent to body esteem shows that girls with greater investment in appearance as a measure of self-worth are more likely to feel worse about their bodies in general (Clark et al., 2008). Interestingly, appearance schemas did not predict desire for thinness. These findings need replicating.

Table 13. Individual characteristics and prospective negative body image in girls and boys; summary of results

Author	BI Outcome	Measures	Main findings	P	G
NEGATIVE AFFECT					
Ricciardelli et al., 2006	BD	PANAS-C	Negative affect did not predict body dissatisfaction at 16 months follow up. Beta 0.08, R2 Change 0.15, p<.001	-	2
	WI	PANAS-C	Negative affect did not predict weight importance at 16 month follow up. Beta 0.04, R2 0.17, p<.001	-	2
	MI	PANAS-C	Negative affect did not predict muscle importance at 16 month follow up. Beta 0.09, R2 Change 0.10, p<.001	-	2
Saling et al., 2005	D	PANAS-C	Negative affect did not prospectively predict dieting at 10 month follow up. Beta 0.02, R2 0.52, p<0.001	-	1
	MP	PANAS-C	Higher negative affect scores at baseline significantly predicted muscle preoccupation 10 months later. Beta 0.16, R2 Change .12, p<0.01	.05	1
	D	PANAS-C	Negative affect did not prospectively predict dieting at 10 month follow up. Beta -0.00, R2 Change 0.06, p<0.01	-	2
	MP	PANAS-C	Negative affect did not prospectively predict muscle preoccupation at 10 month follow up. Beta 0.11, R2 0.23, p<0.001	-	2
DEPRESSION					
Allen et al., 2008	WSC	CDI	Depression did not prospectively predict weight and shape concern at 12 months follow up.	-	3
	BD	CDI	Depression did not prospectively predict body dissatisfaction at 12 months follow up.	-	

	BDist	CDI	Depression did not prospectively predict body distortion 12 months follow up.	-	
	O	CDI	Depression did not prospectively predict overvaluation 12 months follow up.	-	
PERFECTIONISM					
Saling et al., 2005.	D	CAPS	Perfectionism did not predict dieting 10 months later. Beta 0.09, R2 0.52, p<0.001	-	1
	MP	CAPS	Perfectionism did not predict muscle preoccupation 10 months follow up. Beta 0.14, R2 Change .12, <0.01	-	1
	D	CAPS	Higher scores at baseline significantly predicted greater dieting 10 months later. Beta 0.18, R2 Change 0.06, p<.01	.01	2
	MP	CAPS	Higher scores at baseline significantly predicted greater muscle preoccupation 10 months later. Beta 0.20, R2 0.23, p<0.00	.05	2
AUTONOMY					
Clark et al., 2008	DFT	Nomms EAAA	Girls with lower autonomy at Time 1 were more likely to desire a thinner body at 12 month follow up. Beta -.16, R2 Change .024, F change 5.05	0.5	1
	BE	Nomms EAAA	Autonomy did not predict body esteem at 12 month follow up. Beta .01, R2 Change .000, F change 0.02	-	1
APPEARANCE SCHEMAS					
Clark et al., 2008	DFT	CAS	Appearance schemas did not prospectively predict desire for a thinner body at 12 month follow up. Beta .04, R2 Change .002, F change 0.39	-	1
	BE	CAS	Girls with greater appearance schemas at Time 1 had poorer body esteem at follow up. Beta -.16, R2 Change .025, F change 5.36	.05	1

G; Gender 1 = female, 2=male, 3=mixed

Overall, the findings examining individual characteristics as risk factors for the development of negative body image in children need to be interpreted with caution. This is due to the small number of studies which have investigated this relationship and also due to the overreliance on white, middle class Australian samples which significantly reduces the generalisability of these findings.

DISCUSSION

Main findings

This systematic review aimed to establish risk factors for the development of negative body image in children. Ten risk factors were identified; elevated body mass, socio-cultural influences (media, peers, parental) and individual differences (low self esteem, negative affect, depressed mood, perfectionism, autonomy, appearance schemas). A number of inconsistencies were found in the results. This is unsurprising considering the heterogeneous nature of the studies included in this review and will be discussed below.

Higher levels of body mass predicted subsequent increases in body dissatisfaction in both boys and girls. Collectively the findings concerning body mass are consistent with research conducted with adolescents and stipulate the importance of body mass in the development of body dissatisfaction (Paxton et al, 2006; Eisenberg, Neumark-Sztainer & Paxton, 2006). Many of the findings examining increased body mass were significant despite the variety of measures used. This implies that increased body mass can have a negative impact on a range of body image constructs. However, it is important to note that there were some discrepancies in the findings especially in relation to the impact of BMI on muscle dissatisfaction.

The evidence for the impact of socio-cultural influences on the development of negative body image in children is mixed. To date, the prospective impact of parental influence on negative body image has received the most attention. Although there were a number of discrepancies in the findings, overall the research suggests that both mothers and fathers tend to play a significant role in the development of body image concerns in children, in particular their young girls. These findings are consistent with the body of research conducted with adolescents which frequently shows that parents can influence their boys

and girls body image through direct comments, encouragement to lose weight and indirect discussions about dieting (Ata, Ludden & Lally, 2007; Keery et al, 2005). There was less evidence for the impact of parental relations and attachment on the development of body dissatisfaction.

There was some evidence to show that the media can influence young girls' and boys' body image prospectively through perceived pressure to look like the images in the media, internalisation of the media ideals and direct exposure to the appearance ideals portrayed in the media. The experimental research was mixed and only focused on girls. Collectively, however the findings on media influences were inconclusive.

The influence of peers on children's' body image has received the least amount of attention. Similar to the findings with the media and parental influences, the results for peer influences were mixed. There was some evidence to suggest that peer victimisation and appearance teasing can contribute to body dissatisfaction in children. In addition some studies found that peer pressure to be thin contributed to body dissatisfaction in girls. It has been suggested that peer influences are more important among adolescents than preadolescents (Field et al, 2001).

Collectively, very little research has examined the prospective impact of individual characteristics on the development of body image concerns in children. In this review, the impact of depressed mood, perfectionism, autonomy and appearance schemas have only been explored in a single study. The prospective support for low self esteem and negative affect as a risk factor for negative body image in children is mixed. There is however some evidence for the role of autonomy and appearance schemas in the development of body dissatisfaction, however these findings come from a single study and only focus on young girls. Further research is needed to replicate these findings.

Methodological issues

Overall, the stringent inclusion criteria ensured that the studies selected for this review were of adequate quality. However the studies do suffer from a variety of limitations which may in part explain the inconsistent findings. The overall lack of sensitive and appropriate measures assessing both the risk factors and body image constructs in these studies are problematic. The measures used with children have often been developed for adolescents. This is a serious limitation given the considerable differences between children's and adolescents' psychological and cognitive states (Smolak, 2011). The measures of negative body image used in these studies varied considerably in terms of their validity and reliability. Many measures had not been validated with children (Saling et al, 2005; Ricciardelli et al, 2006; McCabe et al, 2005; Lunde et al, 2007; Dohnt et al, 2008) and some authors built their own scales, adapted measures designed for adolescents (i.e., lowered the response ratings or simplified the language) and used single item measures. The studies also relied on self-report measures with only two of the twenty studies using data collected from parents in addition to the children (Erickson et al, 2003; Davison et al, 2010).

Another important issue is the variety of body image measures and risk factor measures used across the studies, which really hindered the ability to make direct comparisons between the studies. For example, looking at the media as a risk factor, the studies all define media influence differentially; including exposure to media ideals, perceived messages from the media, internalisation, and awareness of the media. In addition the studies also looked at these influences using different outcomes (e.g., body esteem, body dissatisfaction, weight concern, shape concern and muscularity concern). The discrepancies in the findings between the studies could be an artefact of the fact that the studies have all measured different things.

The studies included in this review predominantly involved white children from middle class families (based on geographical location or parental income) restricting the ability to generalise the findings to children from different ethnic and socio-economic backgrounds. The majority of findings are based on American and Australian samples. Research, albeit limited, has shown that children from non-western cultures experience body dissatisfaction (Nobakht & Dezhkam, 2000; Huon, Mingyi, Oliver & Xiao, 2002).

Another important methodological consideration is controlling for variables that may impact the differences found in body image scores. Previous research has shown that certain factors can influence negative body image such as socioeconomic status (Paxton et al, 2006) and ethnicity (Schooler, Ward, Merriwether & Caruthers, 2004). It is important for studies to control for these potential confounding variables in the analyses. Although all of the longitudinal studies controlled for baseline outcome measures, not all of the included studies reported controlling for other variables. In addition, the vast majority of studies did not report effect sizes or provide the information to calculate them. This significant omission has practical implications as it makes it difficult to prioritise risk factors in terms of the strength and size of the association.

To gain a greater understanding of the development of negative body image in children, this review considered risk factors as independent agents. It is important to note that this review does not take into account the mediating or moderating factors that interact together to predict negative body image. It is highly likely that influences combined together (i.e., media, peer and parental) are much stronger and powerful predictors of negative body image than any single one (Dunkley, Wertheim, & Paxton, 2001). However the majority of studies included in this review only focused on the impact of individual factors on the development of body dissatisfaction. This could, in part, explain some of the mixed findings or lack of effects as childhood is a period of change in which numerous factors are

likely to interact together to impact body image. Multi-factorial models such as the tripartite model (Thompson et al, 1999) may be more appropriate and useful in explaining the development of negative body image in children (Stice et al, 2004).

Strengths of this review

Steps were taken to reduce the likelihood of bias. Researchers in the field of body image were contacted by the lead author to enquire about relevant studies or unpublished research for the review. In addition dissertations were included in the original search to minimise the "file drawer" problem and reduce selection and publication bias. Only prospective studies examining temporal precedence were included in the review to prevent the possibility of reverse causality and recall bias. For the majority of studies, the focus of the research was to investigate either experimentally or longitudinally the predictors of negative body image in children reducing the risk of reporting bias.

Practical implications of this review

A greater understanding of the development of negative body image in children will lead to more effective prevention programs that can address body image concerns before they become fixed (Smolak & Levine, 2001). The results from this review, although mixed, do provide some useful insight into the risk factors that should be targeted in prevention programs for children. These include, increased body mass, peer teasing, social-cultural pressures to be thin or muscular, modelling and media exposure. Prevention programs that can provide children with the skills to resist the social pressures to look a certain way would be of great benefit. For example, media literacy programs which help children build skills to resist appearance pressure from the media have been found to successfully reduce body dissatisfaction in adolescents aged 13 years old (Wilksch & Wade, 2009). From a developmental perspective, a focus on healthy growth and body acceptance by normalising

bodily changes that occur when approaching puberty may also contribute to improving children's body image.

Future directions

First, researchers need to plan a more co-ordinated and strategic approach to examining body image in children. There are currently many different measures for body image available however researchers would benefit from working together to agree on a smaller set of validated and age appropriate scales that would allow researchers to accurately measure body image and make cross-study comparisons (Steiner-Adair et al., 2002).

Second, to date the majority of research on children has focused on biological and socio-cultural risk factors. More research is needed to examine the role of individual characteristics. This is particularly important because multi-factorial models that explain how factors lead to the development of negative body image typically include individual characteristics as important moderators and mediators (Wertheim, Paxton & Blaney, 2009). In addition, more randomised experiments are needed to provide greater confidence in the conclusions drawn from longitudinal studies.

Finally, a large proportion of studies were excluded from the review because they did not establish temporal precedence. It is essential that authors conducting longitudinal research control for initial levels of the outcome variable (i.e., body image) so that analyses are predicting a change in body image.

Conclusions

In summary, this review has identified several potential risk factors which contribute to the development of negative body image in children. To strengthen the evidence-base there is a need for a more strategic and co-ordinated approach to designing and conducting

research in this area. This will provide a greater understanding of the factors that influence the development of negative body image in children and inform future prevention and intervention programs.

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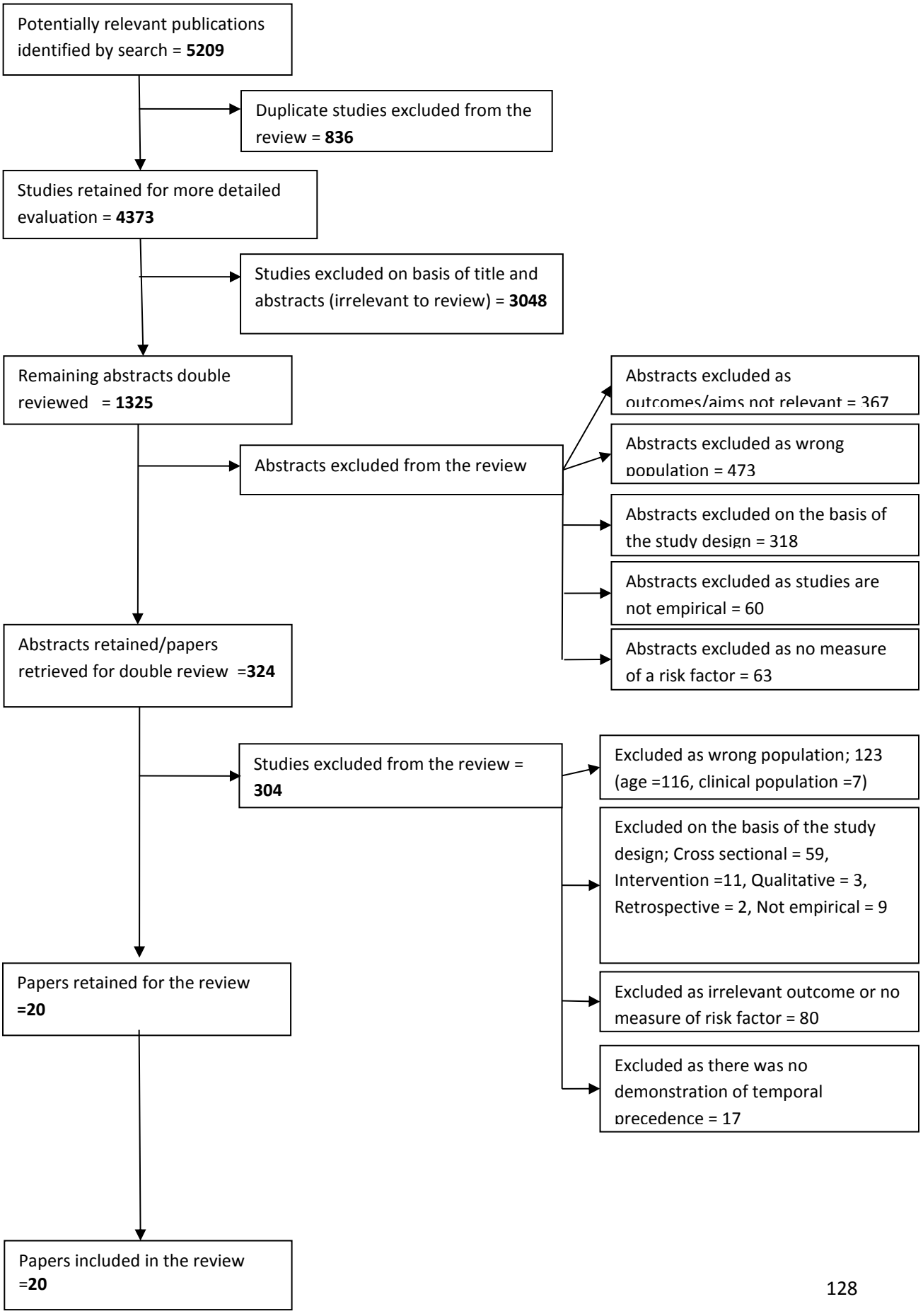
Appendix A: Fig 1 Flowchart of the review process



Appendix B: Measures

Abbreviation	Media Measures
MMIS	The Multidimensional Media Influence Scale (Cusumano & Thompson, 2001) N
IMIS	Internalisation of the media ideals scale (Jones et al, 2004) N
ATE	Appearance Television exposure (Dohnt et al 2006) N
MRFS	McKnight Risk Factor Survey (Shisslak et al 1999) Y
SIBIBCQ	The Sociocultural Influences on Body Image and Body Change Questionnaire (McCabe and Ricciardelli, 2001) N

N =measure is not validated with children, Y = measure has been validated for use with children

Abbreviation	Peer Influence Measures
CFRS	Children's Figure Rating Scale (Tiggemann &Wilson-Barrett, 1998) N
MRFS	McKnight Risk Factor Survey (Shisslak et al 1999) Y
VI	Victimization Index (Rigby, 1999) N
TVS	The Victim scale (Rigby, 1999) N
AT	Appearance Teasing "How often have you been teased over appearance" Purpose built N
SIBIBCQ	The Sociocultural Influences on Body Image and Body Change Questionnaire (McCabe and Ricciardelli, 2001) N
PDD	Peer Discussion of Dieting (Shisslak et al, 1999) N
PR-SDQ-1	Peer relations subscale in the Self Description Questionnaire-I (Marsh, 1990) Y

N =measure is not validated with children, Y = measure has been validated for use with children

Abbreviation	Parental Influence Measures
CFOWS	Comments from Others About Weight or Shape (Allen et al, 2008) Purpose built N
EPAWL	Encouragement of Physical Activity for Weight Loss (Davison et al, 2010) Purpose built N
Mothers BD	Contour Drawing Rating Scale (Thompson and Gray, 1995) N
Fathers BD	Contour Drawing Rating Scale (Thompson and Gray, 1995) N
MRFS	McKnight Risk Factor Survey (Shisslak et al 1999) Y
SS	Security Scale (Kerns et al, 1996) Y
SIBIBCQ	The Sociocultural Influences on Body Image and Body Change Questionnaire (McCabe and Ricciardelli, 2001) N
FHES	Family History of Eating Survey (Moreno & Thelen, 1993) N

PDD	Parental discussion of dieting (Salafia, 2011) N Purpose built
PR- SDQ-1	Parental relations subscale in the Self Description Questionnaire-I (Marsh, 1990) Y

N =measure is not validated with children, Y = measure has been validated for use with children

Abbreviation	**Self Esteem Measures**
GSWS-SPPC	Global Self-Worth Scale of the Self Perception Profile for Children (Harter & Pike, 1984) Y
GS – SDQ-I	General Self subscale of the Self Description Questionnaire-I (Marsh, 1990) Y
SDQ-I	Self Description Questionnaire-I (Marsh,1990) Y

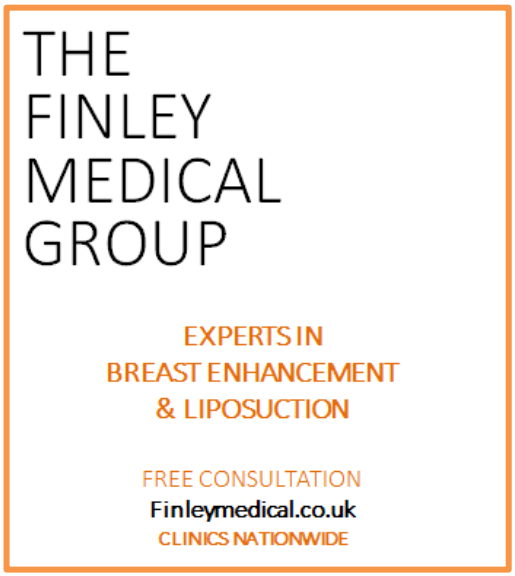
N =measure is not validated with children, Y = measure has been validated for use with children

Abbreviation	**Individual characteristic Measures**
PANAS-C	Positive and Negative Affect Schedule for Children (Joiner et al., 1996) Y
CDI	The Child Depression Inventory (Kovacs 1992) Y
CAPS	Child and Adolescent Perfectionism Scale (Flett et al, 1992) Y
Nomms EAAA	Emotional Autonomy among adolescents (Noom et al, 2001) N
CAS	Children's Appearance Schemas (Clark & Tiggemann, 2007) N

N =measure is not validated with children, Y = measure has been validated for use with children

Appendix B: Example of an advertisement from the cosmetic surgery and model condition **(CosM).**

Appendix C: Example of an advertisement from the cosmetic surgery with no model condition **(CosNM).**



Appendix D: Example of an advertisement from the beauty product with model condition **(BeautyM).**

Appendix E: Example of an advertisement from the beauty product no model condition (BeautyNM).

Appendix F: State Body Dissatisfaction measure

1**.** How satisfied do you feel about your weight right now?

0 100
Not at ——————————————————— Very much
All

2. How satisfied do you feel about your appearance right now?

0 100
Not at ——————————————————— Very much
All

3. How satisfied do you feel about your size and shape right now?

0 100
Not at ——————————————————— Very much
All

Appendix G: Cosmetic Surgery Intentions measure

	Strongly Disagree 1	2	3	4	5	6	Strongly Agree 7
1. In the future, I could end up having some kind of cosmetic surgery.							
2. If I could have a surgical procedure done for free I would consider trying cosmetic surgery.							
3. If I knew there would be no negative side effects or pain, I would like to try cosmetic surgery.							
4. I have sometimes thought about having cosmetic surgery.							
5. I would never have any kind of plastic surgery.							

Appendix H: Internalisation of Cultural Beauty Ideals measure.

	Definitely Disagree 1	Mostly Disagree 2	Neither agree nor disagree 3	Mostly Agree 4	Definitely Agree 5
1. I do not care if my body looks like the body of people who are on TV.					
2. I compare my body to the bodies of people who are on TV.					
3. I would like my body to look like the models who appear in magazines.					
4. I compare my appearance to the appearance of TV and movie stars.					
5. I would like my body to look like the people who are in movies.					
6. I do not compare my body to the bodies of people who appear in magazines.					
7. I wish I looked like the models in music videos.					
8. I compare my appearance to the appearance of people in magazines.					
9. I do not try to look like the people on T.V.					

Appendix I: Appearance Comparisons measure.

	Strongly Disagree 1	2	3	4	Strongly Agree 5
1. I compare myself to those who are better looking than me rather than those who are not.					
2. I tend to compare my own physical attractiveness to that of magazine models.					
3. I find myself thinking about whether my own appearance compares well with models and movie stars.					
4. At the beach or athletic events (sports, gym, etc.) I wonder if my body is as attractive as the people I see there with very attractive bodies.					
5. I tend to compare myself to people I think look better than me.					
6. When I see a person with a great body, I tend to wonder how I 'match up' with them.					
7. When I see good-looking people I wonder how I compare to them.					
8. At parties or other social events, I compare my physical appearance to the physical appearance of the very attractive people.					
9. I find myself comparing my appearance with people who are better looking than me.					
10. I compare my body to people who have a better body than me.					

Appendix J: Ethics Approval Letter

University of the West of England
BRISTOL

Faculty of Health & Applied Sciences
Glenside Campus
Blackberry Hill
Stapleton
Bristol BS16 1DD

Tel: 0117 328 1170

UWE REC REF No: HAS/13/11/141

Date: 27th November 2013

Nicole Paraskeva
The Centre for Appearance Research
University of the West of England
Frenchay Campus, Coldharbour Lane
Bristol, BS16 1QY

Dear Nicole

Application title: An experimental study examining the impact of exposure to cosmetic surgery advertising on women's body image and intentions to undergo cosmetic surgery.

Your ethics application was considered by the Faculty Research Ethics Committee and, based on the information provided, has been given ethical approval to proceed.

You must notify the committee in advance if you wish to make any significant amendments to the original application using the amendment form at

http://www1.uwe.ac.uk/hls/research/researchethicsandgovernance.aspx

Please note that any information sheets and consent forms should have the UWE logo. Further guidance is available on the web:
http://www1.uwe.ac.uk/aboutus/departmentsandservices/professionalservices/marketingandcommunications/resources.aspx

The following standards conditions also apply to all research given ethical approval by a UWE Research Ethics Committee:

1. You must notify the relevant UWE Research Ethics Committee in advance if you wish to make significant amendments to the original application: these include any changes to the study

protocol which have an ethical dimension. Please note that any changes approved by an external research ethics committee must also be communicated to the relevant UWE committee.

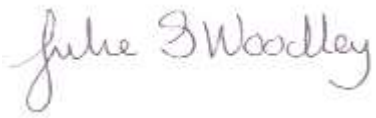
2. You must notify the University Research Ethics Committee if you terminate your research before completion;

3. You must notify the University Research Ethics Committee if there are any serious events or developments in the research that have an ethical dimension.

Please note: The UREC is required to monitor and audit the ethical conduct of research involving human participants, data and tissue conducted by academic staff, students and researchers. Your project may be selected for audit from the research projects submitted to and approved by the UREC and its committees.

We wish you well with your research.

Yours sincerely



Dr Julie Woodley
Chair
Faculty Research Ethics Committee

c.c. Di Harcourt

Appendix K: Information sheet

Women's Opinions on Media and Advertising Images

You are being invited to take part in this study. Before you decide if you would like to participate, it is important for you to understand why the research is being done and what it will involve.

Please take your time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

Who is carrying out the research?

This project is being carried out by researchers at the University of the West of England.

What is the purpose of the study?

The purpose of this study is to investigate and evaluate the effects of media images on women's well-being, mood and perceptions of advertising effectiveness. It also aims to investigate consumer opinions about media imagery and advertising.

What will participation involve and how long will it take?

If you agree to take part in the study you will be required to fill in an online survey. The survey will take approximately 20 minutes of your time. It is really important that you complete the survey in one sitting so please ensure that you have enough time to complete this survey now. As part of the study you will be asked to view a number of media images and then answer questions about the images.

You will also be asked some questions about yourself (e.g., questions about social – cultural pressures) and your opinions about media images.

What about confidentiality?

The information you give us will be treated with the highest level of confidentiality. As the survey is completed online, you will be assigned a unique participant identification code. However, your name and identity will never be connected to your responses. Information that would make it possible to identify you or any other participant will never be included in any sort of report.

Your responses will be written up and the data may be published in an academic journal or elsewhere and although direct quotes from you may be used in a paper or report, your name and identifying information will be kept anonymous. The data will only be accessible to those working on the project.

Do I have to complete the whole survey?

Your participation in this research is entirely voluntary. You have the right to answer as many or as few questions asked as you wish. You also have the right to withdraw from the study up to four weeks after you have completed the survey. Should you wish to withdraw you will need to inform us by email, quoting your participation identification code which you will generate before beginning the study. This will enable us to identify all the material that needs to be deleted due to your withdrawal from the project.

Alternatively if you decide you no longer want to take part in the survey please click on the cross at the top of the webpage and this will close the survey and immediately withdraw you from the study.

What are the potential disadvantages and risks of taking part?

Any participation in research can raise sensitive issues or painful emotions but also positive insights. It is entirely your choice as to what you want to share with the researchers via the survey. We would also like to reassure you that there are no right or wrong answers and no judgements will be made on the basis of what you write.

What are the potential benefits of taking part?

Positive benefits of completing this survey include understanding about some very important areas of research concerning media and advertising images. The findings may also contribute to policy change regarding advertising. Participants will also have the opportunity to be entered into a prize draw to win a £30 Amazon voucher.

Name of the lead researcher

Miss Nicole Paraskeva
University of the West of England
Faculty of Health and Applied Sciences
Department of Psychology
Frenchay Campus, Bristol, BS16 1QY.

Nicole.Paraskeva@uwe.ac.uk

Please feel free to contact the researcher with any questions you might have.

Appendix L: Statement of Consent

Before you take part in the survey, we would like to make sure that you have understood the information we have given so far. Please answer all the following questions honestly.

1.	Do you understand that by consenting to take part in this study you are still able to withdraw at any time without having to give any reasons?	Yes	No
2.	Do you understand that you can ask questions about the study after you have completed the study?	Yes	No
3.	Do you understand that you will never be personally identified in any report or write up that stems from this research and that your name will be replaced by a number so that all the data can remain confidential?	Yes	No
4.	Do you confirm that you are over the age of 18?	Yes	No
5.	Do you consent to taking part in this study?	Yes	No

Appendix M: Debrief

This study was designed to examine the impact of media and advertising images on consumers' wellbeing. We were specifically interested in examining the impact of advertising cosmetic surgery on women's body image and intentions to have surgery. Recently, the advertising of cosmetic surgery in the media has generated widespread political, media and consumer attention. There have been calls for tighter regulations concerning the advertising of cosmetic procedures with some individuals and organisations calling for an outright ban, as is the case in France. However, to date there have been no studies looking at the impact of cosmetic surgery advertising on women's body image and intentions to have cosmetic surgery.

To explore these issues, participants were randomly assigned to view either cosmetic surgery advertisements or different types of advertisements. All participants were asked the same questions. The specific purpose of this research was not disclosed to you at the beginning of the study because sometimes when participants are aware of the study's aims and objectives this can unintentionally affect the way they respond to stimuli and answer questions. This can affect the outcomes of a study.

Would you like to find out more about the topics in this survey?

There are a number of useful links from medical information to support groups/charities set up to help people affected by different body or appearance-related conditions. However, if you have any concerns at all about any aspect of your appearance or about your self-esteem in general, it is always best to start by talking to your GP who can advise you on finding the help you need.

USEFUL LINKS:

1. Centre for Appearance Research
http://www1.uwe.ac.uk/hls/research/appearanceresearch

A centre for psychological and interdisciplinary research in appearance, disfigurement, body image and related studies.

2. The Succeed Foundation http://www.succeedfoundation.org/

A UK charity which aims to promote positive body image and the prevention of eating disorders.

3. OCD Action - Body Dysmorphia http://www.ocdaction.org.uk/support-info/related-disorders/body-dysmorphia/

Information on body dysmorphia from the largest UK charity focusing on Obsessive Compulsive Disorder

4. Mind http://www.mind.org.uk/

The leading mental health charity for England and Wales.

5. BEAT: The Eating Disorders Association www.b-eat.co.uk

A UK charity for people with eating disorders and their families.

6. Changing Faces https://www.changingfaces.org.uk/Home

A UK charity which supports anyone with a disfigurement.

7. NHS Choices – Cosmetic Surgery http://www.nhs.uk/Conditions/Cosmetic-surgery/Pages/Introduction.aspx

Information about cosmetic surgery from the NHS.

Want to contact the researchers?

Please feel free to contact Nicole Paraskeva with any further questions you might have.

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Thank you for your participation