

**Sexualized Media and Self-Objectification in Women and
Adolescents:
A Multi-Method Approach**

by

Marika Skowronski

Doctoral Dissertation

submitted for the Degree of Doctor of Philosophy

to the Faculty of Human Sciences

University of Potsdam

November 2020

Scientific discipline: Psychology

Date of the oral defense: 19.05.2021

First supervisor: Prof. Dr. Barbara Krahé

Second supervisor: Dr. Robert Busching

Reviewers: Prof. Dr. Barbara Krahé, Prof. Dr. Friederike Eyssel

Published online on the

Publication Server of the University of Potsdam:

<https://doi.org/10.25932/publishup-50892>

<https://nbn-resolving.org/urn:nbn:de:kobv:517-opus4-508926>

Danksagung

Mehr als drei Jahre Arbeit gehen nun zu Ende. An dieser Stelle frage ich mich: Wer hat diese Dissertation möglich gemacht? Ohne wen wäre ich an dem einen oder anderen Punkt gescheitert – oder hätte gar nicht erst damit begonnen? Diesen Menschen möchte ich in diesem Abschnitt meine Anerkennung zum Ausdruck bringen. Großer Dank gebührt an erster Stelle Frau Prof. Dr. Barbara Krahe, die von Beginn bis Schluss eine exzellente Betreuung meines Projekts geleistet hat. Mit Scharfsinn, theoretischem Know-How, außerordentlich viel Unterstützung und Zuverlässigkeit hat sie mir ein optimales Arbeitsumfeld ermöglicht. Ausdrücklich hervorheben möchte ich an dieser Stelle ihre Fairness und Gleichbehandlung gegenüber allen Mitarbeiter*innen auf wissenschaftlicher und persönlicher Ebene, die mich sehr beeindruckt haben.

Dann ist da natürlich mein Zweitbetreuer Robert. Wo soll ich hier nur anfangen? Robert stand mir stets mit methodischem wie auch emotionalem Rat zur Seite, hat mir geduldig Programme und Verfahren erklärt und mir wertvolles Feedback gegeben. Am wichtigsten war für mich jedoch, dass er immer für mich da war, selbst wenn die Kinder auf seinem Rücken turnten und den Badezimmerspiegel vollschmierten. Er war für mich nicht nur ein Betreuer, sondern ist auch ein guter Freund geworden. Vielen Dank für die Zeit, die du in mich investiert hast! Ich werde es sehr vermissen, nicht mehr im gemütlichen Chaos-Büro vorbeizuschauen.

Ebenso möchte ich meinen Kolleg*innen Johannes, Paulina, Isabell, Julie, Ariane, Jeanette, Dorle und Emily danken – für eure tatkräftige Unterstützung, die ein oder andere Bälleschlacht sowie die schöne gemeinsame Zeit im Büro und unterwegs.

Darüber hinaus bin ich der Friedrich-Ebert-Stiftung für die dreijährige Förderung meines Projekts dankbar, die es mir erlaubte, mich voll und ganz auf meine Promotion zu konzentrieren und inspirierende Menschen auf Seminaren kennenzulernen.

Forschungsergebnisse sollten für alle frei zugänglich sein – doch dies sind sie leider nicht. Wissenschaftsverlage nutzen ihre Monopolstellung und die Abhängigkeit der Wissenschaftler*innen von Zeitschriftenreputationen, um Raubtier-Kapitalismus zu betreiben. Deswegen danke ich an dieser Stelle Alexandra Elbakyan, Gründerin von Sci-Hub. Nur durch sie können Wissenschaftler*innen aller akademischen Grade ihre Arbeit machen.

Ich danke zudem der Feministin Anita Sarkeesian, durch die ich die Hoffnung bekommen habe, dass sich die Medienlandschaft vielleicht irgendwann etwas ändert. Nicht zuletzt hat sie die Themenwahl dieser Dissertation inspiriert.

Mein großer Dank gebührt außerdem meinen Eltern Sigrun und Matthias, die mir in jahrelanger Erziehungsarbeit die nötigen Eigenschaften mit auf den Weg gegeben haben, um das Durchziehen einer Dissertation überhaupt erst möglich zu machen. Vielen Dank, dass ihr mich stets unterstützt habt, sei es finanziell oder emotional, und ich mich immer an euch wenden darf. Auch meinen Geschwistern Alexa, Felix und Moritz bin ich für Beistand dankbar und dafür, dass ich mich jedes Jahr wieder auf Weihnachten freuen darf.

Ebenso danke ich meinem Partner und Freund Jens, der sich gemeinsam mit mir über Erfolge gefreut, mir in zahlreichen Tiefen beigestanden und mir immer wieder Mut gemacht hat, wenn die Motivation im Keller war. Mit seiner gelassenen und rationalen Art konnte er meinen Emotions-Vulkan in den allermeisten Fällen eindämmen. Und in den anderen Fällen wusste ich, dass er trotzdem an meiner Seite war. Vielen Dank dafür!

Zuletzt möchte ich mich bei meinen lieben Freund*innen Amelie, Anna, Anne, Bernhard, Janis, Kristina, Paul, Sann, Seppi, Sophie, Toschka und Zak dafür bedanken – dafür, dass ihr so erfrischend verschieden und wertvoll seid und mir jeweils auf eure Art geholfen habt, mit beiden Beinen im Leben zu bleiben. Ich schätze euch alle für eure Vielfalt, eure Ideen und eure Eigenheiten. Schön, dass es euch gibt!

The present PhD thesis is based on the following articles:

1. Skowronski, M., Busching, R., & Krahe, B. (2021). The effects of sexualized video game characters and character personalization on women's self-objectification and body satisfaction. *Journal of Experimental Social Psychology*. Advance online publication. <https://doi.org/10.1016/j.jesp.2020.104051>.
2. Skowronski, M., Busching, R., & Krahe, B. (in press). Women's exposure to sexualized television, self-objectification, and consideration of cosmetic surgery: The role of age. *Psychology of Popular Media*.
3. Skowronski, M., Busching, R., & Krahe, B. (in press). Links between exposure to sexualized Instagram images and body image concerns in girls and boys. *Journal of Media Psychology*.
4. Skowronski, M., Busching, R., & Krahe, B. (2021). Predicting adolescents' self-objectification from sexualized video game and Instagram use: A longitudinal study. *Sex Roles*, 84, 584-598. <https://doi.org/10.1007/s11199-020-01187-1>.

Table of Contents

Abstract.....	7
1 Introduction	8
2 Theoretical Background	11
2.1 <i>Sexualization</i>	11
2.1.1 Definition	11
2.1.2 Prevalence of Sexualization in the Media	12
2.2 <i>Sexualized Media and Self-Objectification</i>	13
2.2.1 Objectification Theory	13
2.2.2 Sexualized Media and Self-Objectification.....	16
2.2.3 Mediators and Moderators	18
2.2.4 Further Outcomes of Sexualized Media	20
3 Aims of the Doctoral Research	23
3.1 <i>Superordinate Goals</i>	23
3.2 <i>Study Overview and Specific Goals</i>	24
3.2.1 Study 1.....	24
3.2.2 Study 2.....	25
3.2.3 Study 3.....	26
3.2.4 Study 4.....	27
4 Study 1: The effects of sexualized video game characters and character personalization on women’s self-objectification and body satisfaction	29
5 Study 2: Women’s exposure to sexualized television, self-objectification, and consideration of cosmetic surgery: The role of age	60
6 Study 3: Links between exposure to sexualized Instagram images and body image concerns in girls and boys	81
7 Study 4: Predicting adolescents’ self-objectification from sexualized video game and Instagram use: A longitudinal study	98
8 General Discussion	131
8.1 <i>The role of interactive and social media in the relation between sexualized media and self-objectification</i>	131

8.1.1	Interactive media	132
8.1.2	Social media	133
8.2	<i>Relations between sexualized media and self-objectification among males as well as females beyond college age</i>	134
8.2.1	Males	134
8.2.2	Females beyond college age	135
8.3	<i>Mediators of the relation between sexualized media and self-objectification</i>	136
8.3.1	Thin-ideal internalization	137
8.3.2	Muscular-ideal internalization.....	138
8.3.3	Appearance comparisons.....	138
8.4	<i>Implications for Practice and Future Research</i>	140
8.5	<i>Strengths and Limitations</i>	142
8.6	<i>Conclusion</i>	143
9	References	145

Abstract

Background: A growing body of research has documented negative effects of sexualization in the media on individuals' self-objectification. This research is predominantly built on studies examining traditional media, such as magazines and television, and young female samples. Furthermore, longitudinal studies are scarce, and research is missing studying mediators of the relationship. The first aim of the present PhD thesis was to investigate the relations between the use of sexualized interactive media and social media and self-objectification. The second aim of this work was to examine the presumed processes within understudied samples, such as males and females beyond college age, thus investigating the moderating roles of age and gender. The third aim was to shed light on possible mediators of the relation between sexualized media and self-objectification.

Method: The research aims were addressed within the scope of four studies. In an experiment, women's self-objectification and body satisfaction was measured after playing a video game with a sexualized vs. a nonsexualized character that was either personalized or generic. The second study investigated the cross-sectional link between sexualized television use and self-objectification and consideration of cosmetic surgery in a sample of women across a broad age spectrum, examining the role of age in the relations. The third study looked at the cross-sectional link between male and female sexualized images on Instagram and their associations with self-objectification among a sample of male and female adolescents. Using a two-wave longitudinal design, the fourth study examined sexualized video game and Instagram use as predictors of adolescents' self-objectification. Path models were conceptualized for the second, third and fourth study, in which media use predicted body surveillance via appearance comparisons (Study 4), thin-ideal internalization (Study 2, 3, 4), muscular-ideal internalization (Study 3, 4), and valuing appearance (all studies).

Results: The results of the experimental study revealed no effect of sexualized video game characters on women's self-objectification and body satisfaction. No moderating effect of personalization emerged. Sexualized television use was associated to consideration of cosmetic surgery via body surveillance and valuing appearance for women of all ages in Study 2, while no moderating effect of age was found. Study 3 revealed that seeing sexualized male images on Instagram was indirectly associated with higher body surveillance via muscular-ideal internalization for boys and girls. Sexualized female images were indirectly linked to higher body surveillance via thin-ideal internalization and valuing appearance over competence only for girls. The longitudinal analysis of Study 4 showed no moderating effect of gender: For boys and girls, sexualized video game use at T1 predicted body surveillance at T2 via appearance comparisons, thin-ideal internalization and valuing appearance over competence. Furthermore, the use of sexualized Instagram images at T1 predicted body surveillance at T2 via valuing appearance.

Conclusion: The findings show that sexualization in the media is linked to self-objectification among a variety of media formats and within diverse groups of people. While the longitudinal study indicates that sexualized media predict self-objectification over time, the experimental null findings warrant caution regarding this temporal order. The results demonstrate that several mediating variables might be involved in this link. Possible implications for research and practice, such as intervention programs and policy-making, are discussed.

1 Introduction

“Looking at those images totally made me feel and want to be, you know, either super tall, super thin, just you know, I had to be gorgeous in order to have this total package of happiness.” – with these words, a female participant expresses her reaction to images of women in the media in a qualitative study (Randazzo et al., 2015, p. 110). Feminist media critics and sociologists have long criticized the media for being a major source for body image concerns by displaying images of appearance standards that are impossible to meet for most people. An extensive body of research over the past decades has shown that the media can have a negative impact on how people see themselves and feel about their body (for reviews, see Barlett et al., 2008; Grabe et al., 2008; G. Holland & Tiggemann, 2016). Since the late 1990s, researchers have begun to address a specific but pervasive component of mainstream media: The sexualization of women, that is the emphasis of women’s sexual appearance and sexual appeal to others (APA Task Force on the Sexualization of Girls, 2007). This phenomenon can be observed in virtually all types of media (Ward, 2016), and content analyses demonstrate that the sexualization of women in the media has increased over the past decades (Graff et al., 2013; Hatton & Trautner, 2011). For example, estimations indicate that female characters are sexualized in 71% of music videos (Frisby & Aubrey, 2012). Notably, researchers also documented an increase of men’s sexualization especially in social media (Deighton-Smith & Bell, 2018), though at a much lower rate compared to women’s (e.g., Carrotte et al., 2017; Hatton & Trautner, 2011). For example, 16.32% of women and 9.42% of men wore sexualized clothing when examining popular fitspiration images on social media (Deighton-Smith & Bell, 2018). These high prevalence rates have caused the American Psychological Association (APA) to commission a task force on the topic as there were concerns about the impact of sexualization on women, girls, and society as a whole. As a result, a widely read report on the sexualization of girls was published (APA Task Force on the Sexualization of Girls, 2007), which has sparked research on the relation of sexualized media to body image concerns after its release. The umbrella term “body image” describes individuals’ perception of their physical self and the resulting positive and negative thoughts, beliefs, feelings, and behaviors towards their body (Cash, 2004). One important component of body image is self-objectification. This term describes that people view themselves as an object to be evaluated based upon appearance (Fredrickson & Roberts, 1997), and is conceptualized in this dissertation as valuing one’s body appearance over competence and body surveillance. Because sexualization is argued to deliver the message of women being an object, self-objectification is discussed as a direct outcome of sexualized media in the original research by Fredrickson and Roberts (1997) and again in the

2007 APA report (APA Task Force on the Sexualization of Girls, 2007). Since then, a growing body of evidence suggests that sexualization in the media is linked to self-objectification among young women and men as well as adolescent girls and boys (for a meta-analysis, see Karsay et al., 2018; for a review, see Ward, 2016). However, as many factors concerning this link remain understudied, the present PhD thesis was designed to fill several of these research gaps to gain a better understanding of the conditions under which the relation between sexualized media and self-objectification holds. Moreover, mediators and moderators of this link were investigated that were discussed in the literature but not yet examined.

The research showing that sexualized media is connected to self-objectification is predominantly built on studies examining traditional media, such as magazines and television (Ward, 2016). However, media use has changed substantially in the past decades especially for young people: Television use is declining, print magazines are barely read anymore, and social and interactive media are gaining massive popularity (ARD/ZDF, 2020; Twenge et al., 2019). At the same time, these new media have features that set them apart from traditional media: Interactive media offer users the possibility to control their media characters, which might possibly lead people to identify more with them (Konijn et al., 2007), eventually intensifying media effects on body image concerns. Social media, on the other hand, represents a “unique combination of factors including peer interactions, popularity of photo-sharing, and the accessibility of mobile technology” (Cohen et al., 2017, p. 183). Despite these facts, studies examining sexualization in interactive and social media are rare. To address this lacuna, one goal of the present PhD thesis was to investigate the links between sexualized social media (Study 3, Study 4) and interactive media (Study 1, Study 4) to body image concerns.

A second shortcoming of the previous studies on the topic is its focus on female samples of adolescent or young adult age. No known study has included women beyond college age – it is therefore unknown whether the proposed relations between media use and self-objectification hold for older women, and it is unknown whether age functions as a moderator in this link, like some researchers discuss (Ward, 2016). Furthermore, some first studies have begun to connect sexualization to various variables of men and boys’ negative body image (Fatt et al., 2019; Mulgrew et al., 2014; Vandenbosch et al., 2017; Vandenbosch & Eggermont, 2013, 2015, 2016), but research is still needed in this area bearing in mind the growing presence of male sexualization in the media. As such, a major aim of this PhD thesis was to examine the relations between sexualized media and self-objectification among women across a broader age spectrum (Study 2), and among males (Study 3 and 4).

While the media–body image link has been tested extensively at least among female samples, less is known about mediators and moderators of the relation between the two constructs. For whom is the link most powerful? Do interactive media possess features that intensify or diminish the effect? Hence, examining these questions presents a third goal of this PhD thesis. Specifically, it was investigated whether character personalization is a moderator of the proposed effect of sexualized video game use on self-objectification and body satisfaction (Study 1). Furthermore, it was examined whether the link between sexualized media and self-objectification is moderated by age (Study 2) and gender (Study 3, Study 4). Finally, the role of appearance comparisons, thin-ideal and muscular-idea internalization as mediators between sexualized media use and self-objectification were explored (Study 4).

The present dissertation is divided into the following chapters: After the *Introduction*, *Chapter 2* provides the theoretical background of the present research by giving an overview of the relevant constructs and introducing the theoretical background. In Section 2.1, the term sexualization is defined, and a snapshot about the prevalence of sexualization in the media is given. In addition, Section 2.2 introduces objectification theory as the theoretical framework and gives an overview of the research on the link between sexualized media and self-objectification, its mediators and moderators, as well as further outcomes of sexualization.

After the theoretical background, *Chapter 3* presents the major aims of this dissertation. Moreover, this chapter gives an overview of the four studies presented in this thesis and specifies the research goals of each study. The following chapters present the four empirical studies composing this PhD thesis. *Chapter 4* covers the first study which investigated the effect of sexualization and personalization of video game avatars on young women's body image concerns in an experimental design. The second study, included in *Chapter 5*, examines the role of age in the cross-sectional link between sexualized television use and self-objectification in a sample of women across a broad age spectrum. *Chapter 6* includes the third study, which was concerned with the role of gendered sexualized images on Instagram and its cross-sectional relation to self-objectification in a sample of male and female adolescents. In *Chapter 7*, the fourth and final study is displayed which investigated longitudinal relations between sexualized video game and Instagram use and self-objectification among a sample of male and female adolescents.

Finally, *Chapter 8* provides a summary of the four studies and a discussion of the main findings with respect to previous evidence. Additionally, the theoretical and practical implications of the empirical studies as well as their strengths and limitations are discussed.

2 Theoretical Background

2.1 Sexualization

2.1.1 Definition

Early definitions of the concept of sexualization originated within research examining media portrayals of women (Ward, 2016). This research criticized the depiction of women in the media as objects for the pleasure of others, labelling this phenomenon *sexual objectification*. The term objectification describes when people appraise individuals as bodies and behave toward them as objects rather than persons (Fredrickson & Roberts, 1997). In the late 1990s, two research teams began to investigate causes and consequences of sexual objectification within a wider societal framework (Fredrickson & Roberts, 1997; McKinley & Hyde, 1996). While their approaches to the topic were slightly different, both teams framed sexual objectification not only as an isolated media phenomenon but as a general characteristic of Western cultures. These theoretical advances eventually caused the APA to release a report on the sexualization of girls, framing sexual objectification as being only one part of *sexualization*. According to the APA Task Force on the Sexualization of Girls (2007), sexualization occurs when (a) a person's value comes only from his or her sexual appeal or behavior while ignoring other characteristics, (b) when a person is held to a standard that equates physical attractiveness with being sexy, (c) when a person is treated as a sexual object, and/or (d) when sexuality is inappropriately imposed upon a person (e.g., in the case of children). Any one of these conditions is a sufficient indicator for sexualization, thus defining sexualization as a broad cultural phenomenon that not only includes media portrayals but also social interactions, for example. Due to the developments in terminology, a lot of literature used the terms *sexual objectification* and *sexualization* interchangeably until researchers began to encourage scholars to clarify the definition of the terms in their work (e.g., Ward, 2016). Research shows that sexualized persons are more likely to be processed and categorized as objects by others, that they are perceived as having less humanlike traits compared to nonsexualized persons, and that they are more likely to be socially excluded (Bernard et al., 2020). As such, sexualization of individuals leads to the objectification of these individuals, with possibly grave consequences.

Because women experience more sexualization than men in their everyday life via the media, comments and actions of other people, a lot of research has investigated the effects of sexualization on women (E. Holland et al., 2017; Swim et al., 2001; Ward, 2016). However, it has been argued that the APA definition of sexualization (2007) can also be applied to describe sexualization for males, although there might be other cultural standards of appearance for men

compared to women (Vandenbosch & Eggermont, 2013). For example, sexualized men in the media usually have a toned, muscular body and are not shown in a subordinated and passive but rather dominant and active way (Gill, 2009). In the course of this development, the past years have seen an increase in research on the prevalence and consequences of sexualization of males, although evidence is limited so far (Gill, 2009; Hatton & Trautner, 2011; Pope et al., 2001; Vandenbosch & Eggermont, 2013, 2015).

2.1.2 Prevalence of Sexualization in the Media

The media are one of the major source for sexualized messages (Fredrickson & Roberts, 1997), which is why it is important to get a snapshot of the prevalence of female and male sexualization in the media landscape. Sexualized portrayals of women appear frequently in all types of media: Content analyses reveal that female characters are depicted in a sexualized way in 71% of music videos (Frisby & Aubrey, 2012), 45.5% of prime-time television (S. L. Smith et al., 2012), 50% of reality shows (Flynn et al., 2015), and 22% of television commercials featuring women in the United States (Messineo, 2008). Sexualized images of women can be found further in over 50% of magazine ads (Stankiewicz & Rosselli, 2008). An analysis of girls' magazines found that sexualized images of girls have increased and childlike images have decreased over the past decades (Graff et al., 2013). Going beyond traditional media, sexualization is also common in video games. Female characters are strongly underrepresented, but if they are present, they are heavily sexualized: Downs and Smith (2010) found that in the 20 US top-selling games of 2003, only 14% of the characters were female, and 41% of these characters appeared in sexually revealing clothing and 43% partially or fully nude. Several content analyses document similar prevalences of sexualized female characters (Beasley & Collins Standley, 2002; Burgess et al., 2007; Dill & Thill, 2007). Together, these numbers clearly demonstrate that sexualization of women is a common feature of mainstream media. Probably for this reason, research on the topic has in a large part focused on women's sexualization and its effect on female consumers. However, men are often depicted in a sexualized way as well, and the numbers seem to increase: In video games, 5.8% of men appear sexualized (Burgess et al., 2007). In the analysis mentioned above, Downs and Smith (2010) found that 11% of male characters wore sexually revealing clothing. An analysis of music videos revealed that men were sexualized in 2.4% of the scenes featuring men alone and 11.2% of the scenes featuring men and women at the same time (Vandenbosch et al., 2013). Furthermore, 5.02% of Belgian (Verhellen et al., 2016) and 6.6% of Philippine television advertisements (Prieler & Centeno, 2013) have been shown to feature suggestively dressed men. Hatton and Trautner (2011) examined the cover images of the popular magazine *Rolling*

Stone over four decades and found that sexualized images of men tend to increase, pointing to a trend. In summary, these numbers show that sexualization of men is on the rise, although women are still sexualized at a much higher rate. Research on social media, which has increased rapidly in the past decade, confirms this trend: Content analyses document frequent sexualization of both men and women (Carrotte et al., 2017; Davis, 2018; Tiggemann & Zaccardo, 2018). For example, an analysis of fitspiration images, a fitness trend providing social media content that should inspire people to exercise, revealed that 47.7% of female and 29% of male pictures feature elements of sexualization (Carrotte et al., 2017). The majority of the current most popular influencers on the social medium Instagram are models, fitness coaches and beauty bloggers (Hopper, 2019), who often post sexualized images of their bodies (Liu & Suh, 2017).

As can be discerned from these data, sexualization is ubiquitous in contemporary mainstream media. At the same time, people use media constantly: On average, German citizens over 14 spend more than seven hours per day using media, with numbers rising (ARD/ZDF, 2020). Real-time and nonlinear television make up the biggest part (ARD/ZDF, 2020). Yet especially among the youth, social media has become an integral part of people's lives, with adolescents spending over 3 hours per day on social media (DAK-Gesundheit, 2017). Bearing these numbers in mind, it can be reasoned that people are exposed frequently to sexualized portrayals of men and especially women in their everyday life. As sexualized media put an emphasis on the body and its appearance in line with very narrow beauty ideals (Fredrickson & Roberts, 1997), this raises the question whether this exposure has consequences for people's body image.

2.2 Sexualized Media and Self-Objectification

2.2.1 Objectification Theory

A well-supported dominant framework for understanding the relations between sexualized media use and body image concerns is *objectification theory* (Fredrickson & Roberts, 1997). According to this theory, women in Western societies learn from an early age that their body is looked at and evaluated by others – that they are objectified. Objectification happens through various processes, for example through treating women as tools for sexual pleasure (Anslinger, 2019), through sexualized gazing, sexualized comments and sexualized media. Cite Fredrickson and Roberts (1997) argue that women are then treated as bodies that exist for the pleasure and use of others. Being aware of the pressure to care about physical appearance and the disadvantages that women face for being deemed unattractive, women then

gradually internalize cultural beauty standards as their own. As a result, they are socialized to take an observer's perspective of their bodies. This means that women to some degree view themselves as objects evaluated by others. The authors call this effect *self-objectification*, which can be understood as an acculturated trait. Yet through certain situations or cues, e.g. media images, self-objectification might also be elicited momentarily and can thus be described as a state, leading women to focus more on their appearance and body parts in the respective moment.

There have been developments of objectification theory throughout the years. Researchers claim that self-objectification is a multidimensional concept (Calogero, 2011; Moradi, 2010, 2011; Moradi & Huang, 2008): On the cognitive level, it is manifested through valuing one's body's appearance over its competence (further referred to as valuing appearance). On the behavioral level, it is displayed through persistent body surveillance (also referred to as body monitoring in the literature). As such, there have been different operationalizations of the construct in the literature (Calogero, 2011). It is important to note that both operationalizations have been subjects to debate in the literature: Objectification theory defines self-objectification as the view of the self as an object in the eyes of others and posits self-objectification as a vulnerability factor for body image concerns (Fredrickson & Roberts, 1997). However, the current prominent measures of self-objectification (valuing appearance, body surveillance) are characterized by a strong appearance focus and an overlap with traditional measures of body image concerns, such as social comparison (Kahalon et al., 2018; Lindner & Tantleff-Dunn, 2017). As such, it can be argued that these measures conceptualize self-objectification as a component of body image concerns as a wider construct rather than a vulnerability factor.

In their original work, Fredrickson and Roberts (1997) postulate that women's constant awareness of their appearance may promote body shame and anxiety as it is almost impossible for women to meet society's current beauty standard. These factors might then contribute to depression, sexual dysfunctions, and eating disorders. Indeed, evidence has connected both valuing appearance and body surveillance to depressive symptoms (Tiggemann & Slater, 2015; Tiggemann & Williams, 2011), sexual dysfunction (Calogero & Thompson, 2009), and disordered eating (Calogero et al., 2005; Schaefer & Thompson, 2018) in women, alongside a vast array of other negative outcomes, such as body shame and appearance anxiety (Calogero, 2004; Slater & Tiggemann, 2010), decreased life satisfaction (Mercurio & Landry, 2008) and decreased cognitive performance (Aubrey & Gerding, 2015; Fredrickson et al., 1998).

Although objectification theory was not primarily designed to explain media effects, Fredrickson and Roberts (1997) attribute a critical role to the media in delivering experiences of sexualization to women on a daily basis, for example through commercials and advertisements that focus solely on women's sexual attractiveness. For this reason, objectification theory has well served as a framework for media researchers during the past decades. Corroborating its premises, the use of sexualized media has been connected to valuing appearance and body surveillance in numerous correlational studies (Daniels et al., 2020; Karsay et al., 2018; Ward, 2016). These findings have been complemented by data from experimental studies demonstrating that women exposed to sexualized media show higher levels of state self-objectification compared to those exposed to neutral or nonsexualized media (e.g., Aubrey et al., 2009; Fox et al., 2015; e.g., Karsay & Matthes, 2020). Meanwhile, the use of sexualized media images of women represents a common methodological approach to elicit state self-objectification in experimental research.

Much of the research and theory on media use and self-objectification was conducted with women since objectification theory was originally grounded in women's experiences. Nevertheless, some research indicates that objectification theory can be extended to men (Calogero, 2009; Davids et al., 2019; Moradi & Huang, 2008). The underlying processes between media use and self-objectification seem to be similar for males and females (Vandenbosch & Eggermont, 2015). For example, men's objectifying experiences were related to body surveillance and eating disorder symptoms in a study by Wiseman and Moradi (2010). Furthermore, sexualized media have been found to predict body surveillance in men, which then predicted body shame and appearance concerns during sexual interactions (Aubrey, 2007). Still, research examining effects of sexualized media on men's body image concerns is in its early stages, indicating the need for future studies.

It is important to note that research on the promise of objectification theory for men suggests that males have lower levels of valuing appearance and body surveillance (Moradi & Huang, 2008). Moreover, men experience fewer objectifying experiences than women (Swim et al., 2001) and sexualized portrayals of men are less frequent in the media (Carrotte et al., 2017; Downs & Smith, 2010; Hatton & Trautner, 2011). That means that, although men experience similar patterns, women still seem to be at a higher risk for experiencing body image concerns and thus developing serious psychological problems like eating disorders and depression.

2.2.2 Sexualized Media and Self-Objectification

In line with the propositions of objectification theory, the exposure to sexualized media should lead individuals to value body appearance over competence and to engage more in body surveillance. This assumption has been tested in a vast array of research with different media types and methods. Correlational research has demonstrated significant positive associations between self-objectification and the use of sexualized television programs, music videos, magazines and social media (Aubrey, 2007; Fardouly et al., 2015; Grabe & Hyde, 2009; Morry & Staska, 2001). Surprisingly, no correlational study has measured sexualized video game use so far. The majority of these studies included female college students, but some studies also documented the association with female adolescents (e.g., Harrison & Fredrickson, 2003; Meier & Gray, 2014; Tiggemann & Slater, 2014, 2015; Vandenberg & Eggermont, 2012), young girls (Slater & Tiggemann, 2016) and pregnant women (Hopper & Aubrey, 2013). Studies including women older than college age are still missing. Limited research on boys and men show relations of media use and self-objectification (Aubrey, 2007; Dakanalis et al., 2012; Manago et al., 2015), but the findings are complemented by several null results (Morry & Staska, 2001; Vandenberg & Eggermont, 2013).

Until now, there are only few longitudinal studies on the topic. Aubrey (2006) found that women's and men's exposure to sexualized television predicted valuing appearance two years later, and the use of sexualized magazines predicted body surveillance for men. Vandenberg and Eggermont (2015) demonstrated that male and female adolescents' sexualized magazine use predicted self-objectification six months later. In another publication based on the same study, they analyzed that the extent to which adolescents monitor attractive peers on social media, which was used as the measure of sexualized social media use, predicted self-objectification six months later (Vandenberg & Eggermont, 2016). Apart from these studies, there is no longitudinal research on sexualized media and self-objectification. Two longitudinal studies found relations between general media use and self-objectification and its related concepts (de Vries et al., 2016; Wang et al., 2019), with a null result by Sevic et al. (2020), but research is still needed that measures habitual exposure to sexualization in the media within the framework of objectification theory. This is especially important considering the changes of media use in recent years: The use of television, movies and magazines has declined on a large scale, whereas social media and video games become increasingly popular (Twenge et al., 2019). As there are no longitudinal studies on objectification theory including sexualized or even general video game use, and only few studies on social media, further research is needed in this area. Also, continued testing of objectification theory among males is warranted, as

sexualized images of muscular men become more and more visible in today's mainstream media (Carrotte et al., 2017; Deighton-Smith & Bell, 2018).

Correlational research comes with big disadvantages: Data from self-reports can be subject to bias and thus cause systematic errors (e.g., Nederhof, 1985; Welkenhuysen-Gybels et al., 2003). Furthermore, definite conclusions about the causal nature of the proposed relationships cannot be made using correlational designs. For this reason, experimental research offers a vital extension to correlational studies on media use and self-objectification. In general, experimental studies support the premises of objectification theory by showing that women exposed to sexualized media images and music videos report increased self-objectification afterwards compared to neutral or nonsexualized media (e.g., Aubrey et al., 2009; Aubrey & Gerding, 2015; Daniels, 2009; Grey et al., 2016; Halliwell, Malson, & Tischner, 2011; Karsay & Matthes, 2020). As with correlational and longitudinal studies, research with male samples is limited: One study found that the exposure to images showing the muscular ideal did not affect men's self-objectification (Michaels et al., 2013), another study found that viewing sexualized media images of athletes, compared to performance images of the same athletes, increased undergraduate men's self-objectification (Linder & Daniels, 2018). An experience sampling study found that the exposure to thinspiration and fitspiration images led to higher body dissatisfaction in both women and men (Griffiths & Stefanovski, 2019).

Again, experimental studies including social and interactive media formats are rare: Tiggemann and Zaccardo (2015) show that, compared to neutral images, the exposure to fitness imagery from the popular social media hashtag #fitspiration increased women's body dissatisfaction, a concept related to self-objectification. Fitspiration imagery is known for its high level of sexualization (Deighton-Smith & Bell, 2018). In line with these findings, Prichard et al. (2017) found that women's body dissatisfaction increased after viewing fitspiration imagery in a pre-post design. Although there are no known experimental studies on the effect of sexualized social media images on self-objectification, results from experiments using traditional magazine images might be comparable since the pictures themselves are similar. However, sexualized portrayals in media like video games are different, as they usually involve interactive features with the respective character: Users can slip into the roles of their characters and control them. These features might distinguish effects of sexualized interactive media on body image concerns compared to traditional or image-based media. For example, the effects might be stronger due to the higher immersion that people feel when playing video games (Karsay et al., 2018) or it might disappear due to the cognitive demands that comes with playing video games (Read et al., 2018). As mentioned before, correlational data is lacking. The few

existing experimental studies suggest that playing with a sexualized video game character, compared to playing with a nonsexualized character, increases state self-objectification among female undergraduates (Fox et al., 2015) and female and male adolescents (Vandenbosch et al., 2017), with a null effect found by Read et al. (2018). However, research is still lacking examining how features specific to video games might influence the proposed effect of sexualization on self-objectification. For example, users can often personalize their characters, which has been shown to increase identification with the avatar (Turkay & Kinzer, 2014). As such, playing with sexualized and personalized avatars might lead people to self-objectify more strongly compared to sexualized generic avatars. To date, these questions remain to be studied. Furthermore, the underlying processes of video game effects on body image concerns are an unsolved issue. While previous research on objectification theory has used priming theory to explain effects of sexualized media on self-objectification (Aubrey et al., 2009; Karsay et al., 2018), some scholars discuss the so-called Proteus effect to describe what happens when people control sexualized interactive media characters (Fox et al., 2013; Yee & Bailenson, 2007, 2009). The Proteus effect means that users embody avatars, observe them in the virtual world and then draw inferences about their own attitudes and beliefs based on these observations. For example, participants were better in cognitive tasks after having embodied Einstein compared to a neutral character (Banakou et al., 2018). To date, it is still under debate whether the priming or the Proteus explanation is behind the presumed effects of sexualized interactive media on self-objectification, indicating the need for further research.

2.2.3 Mediators and Moderators

Much research has analyzed mediators between self-objectification and the outcomes postulated by objectification theory, such as depression and disordered eating (Peat & Muehlenkamp, 2011; Szymanski & Henning, 2007; Tiggemann & Williams, 2011). Less attention has been given to variables that might mediate links between the postulated causes, like the exposure to sexualized media, and self-objectification. Fredrickson and Roberts (1997) propose that due to the exposure to sexualized messages, women are gradually socialized to take an observer's perspective on their body. It is likely that various cognitive and affective mechanisms intervene in that process (Aubrey, 2007). Objectification scholars have discussed two possible mediators: The internalization of cultural standards of attractiveness or appearance-ideal internalization (Moradi, 2010) and appearance comparisons (Fardouly et al., 2015). These variables are both argued to increase self-objectification. In line with this reasoning, Moradi (2011) proposed a conceptual shift in understanding self-objectification as a process rather than one specific variable. A current prominent model describing this process is

the three-step model by Vandebosch and Eggermont (2015). Following this model, sexualized media increases valuing appearance directly and indirectly via appearance-ideal internalization. Both of these variables then heighten body surveillance. The authors argue that appearance-ideal internalization and valuing appearance constitute the cognitive components of the process preceding body surveillance as the behavioral component. This model has been tested among male and female adolescents, measuring their TV and magazine exposure as well as their general Facebook use. As the model has been developed recently, continued testing is needed. Furthermore, the model posits appearance-ideal internalization as the only mediator in the relationship with media use and self-objectification. Yet cross-sectional studies suggest that both appearance-ideal internalization and appearance comparisons play a role in the process (Fardouly et al., 2018; Fatt et al., 2019; Feltman & Szymanski, 2018). Up to date, no longitudinal research has included both variables in the framework of objectification theory. Hence, more research is needed for understanding the mediating variables between sexualized media and self-objectification. Furthermore, standards of cultural attractiveness can differ regarding the type of person. Images on social media suggest the thin ideal for women and the muscular ideal for men (Tiggemann & Zaccardo, 2018). Most of the research on appearance-ideal internalization has focused on the thin ideal (Dittmar & Howard, 2004; Mingoia et al., 2017). However, one cross-sectional study showed that for men, exposure to fitspiration imagery predicted body dissatisfaction through muscular-ideal internalization (Fatt et al., 2019). Also, the muscular ideal becomes more and more important for females as well (Bozsik et al., 2018; Tiggemann & Zaccardo, 2018). Despite these recent developments, no known research has yet included different forms of internalization into one framework, indicating the need for future research.

Apart from testing possible mediators, there is still a lot of work to be done concerning potential moderators of the proposed relation between sexualized media consumption and self-objectification. Which factors might buffer the proposed negative effect, and which variables might fortify it? In a meta-analysis, Karsay et al. (2018) examined various potential moderators (age, gender, ethnicity, media type, study design characteristics) and found significant moderating effects only for media type: The effect size of the effect of media use on self-objectification was stronger when participants used video games. This finding might be explained by participants embodying the sexualized video game characters, which might lead to stronger effects. Also, specific characteristics of video games (e.g., personalization) might enhance media effects – these are hypotheses which still remain to be tested.

Furthermore, there are several reasons why the moderating effect of age still needs to be examined: First, although a moderating effect was not found in the meta-analysis by Karsay et al. (2018), the authors report that the age range in the studies included was extremely narrow, with an average mean below 20 years. Similarly, Ward (2016) concludes in her review of the effects of female sexualization in the media that to date, there are no studies including women older than college age. Without studies including participants of a broad age spectrum, no reliable statements can be made about moderating effects of age. Second, people tend to become further away from the media's narrow body ideals when growing older (Slevec & Tiggemann, 2011) – a reason why the effect of sexualized media might affect older individuals to greater extent. And third, researchers have shown that self-objectification decreases over time (Clarke & Korotchenko, 2011). It seems obvious that already for this reason, age probably plays some role in the relations between media exposure and self-objectification. As a consequence, research is needed investigating objectification theory in a sample with a broader age spectrum.

It is interesting that apparently, gender has not been found as a moderator in the aforementioned meta-analysis (Karsay et al., 2018). Indeed, in longitudinal studies on the three-step process of self-objectification, gender did not moderate the relation between adolescents' sexualized media use and their appearance-ideal internalization, valuing appearance and body surveillance (Vandenbosch & Eggermont, 2015, 2016). However, these studies did not include different facets of appearance-ideal internalization, and they did not differentiate between male and female sexualization in the media they measured. Muscular-ideal internalization might be more important for males (Moradi, 2010), and people might be affected more by sexualized portrayals of their own gender. For this reason, it might be interesting to look at these factors when investigating sexualized media effects in a sample of males and females.

2.2.4 Further Outcomes of Sexualized Media

Researchers testing principles of objectification theory have mostly studied the influence of sexualized media on self-objectification. However, objectification theory suggests that the exposure to objectifying experiences in the media also increases individuals' concerns about their body (Fredrickson et al., 1998; Noll & Fredrickson, 1998). Sexualized media portrayals of women and men convey standards of physical attractiveness in the form of thin and athletic models that are impossible to reach for most people. At the same time, these standards are often presented as achievable. This contradiction might cause women and men to become dissatisfied with their bodies. A considerable number of meta-analytic and review studies have documented that the exposure to the thin ideal for women and the muscular ideal

for men is linked with lower levels of body satisfaction (Barlett et al., 2008; Fardouly & Vartanian, 2016; Grabe et al., 2008; G. Holland & Tiggemann, 2016; Huang et al., 2020; López-Guimerà et al., 2010). It seems likely that sexualized media cause the same effect, as they usually feature thin and athletic women and men (Deighton-Smith & Bell, 2018; Flynn et al., 2015; Hatton & Trautner, 2011; Vandenbosch et al., 2013). Accordingly, experimental research shows that women and men report decreased body satisfaction after exposure to sexualized images in traditional media such as magazines and television (e.g., Halliwell, Malson, & Tischner, 2011; Krawczyk & Thompson, 2015; Pennell & Behm-Morawitz, 2015; L. R. Smith, 2016; Strahan et al., 2008). For example, Mischner et al. (2013) demonstrated that women who viewed sexualized music videos reported a greater discrepancy between their perceived and their ideal body size than those who viewed neutral music videos. As with research on self-objectification, there is a lack of studies examining body satisfaction as an outcome after the exposure to sexualized interactive media. This is especially interesting bearing in mind the debate about the underlying mechanisms of interactive media effects (see Section 2.2.2). As previously mentioned, researchers propose that users controlling video game avatars experience the Proteus effect: They infer characteristics of their avatar onto themselves (Yee & Bailenson, 2007). In the case of sexualized avatars, users then embody avatars representing the thin ideal. Assuming the Proteus effect as the underlying process, this should eventually lead users controlling sexualized avatar to experience a boost in body satisfaction. In line with this reasoning, Matthews et al. (2016) found that women who played hyper-idealized compared to realistic video game characters reported greater body satisfaction. However, as this is the only study to date that measured body satisfaction as an outcome after manipulating the degree of sexualization of video game characters, this area of research remains understudied.

Many researchers have discussed self-objectification as a marker for the development of other body image concerns and disturbances, like body shame, appearance anxiety, and eating disorders (Moradi & Huang, 2008; Noll & Fredrickson, 1998). In sum, it may be presumed that sexualized media leads people to self-objectify, which is in turn related to trying to change their appearance. For example, studies show that self-objectification is related with tanning behavior (Trekels et al., 2018), appearance-focused exercising (Prichard & Tiggemann, 2005, 2008; Strelan & Hargreaves, 2005), or restrained eating and bulimic symptoms (Noll & Fredrickson, 1998), for instance. Another factor that has been discussed in the objectification literature is the consideration of cosmetic surgery. The numbers of cosmetic surgeries are on a constant rise, especially for those that lift aging body parts (American Society of Plastic Surgeons, 2018). Research shows that the higher women are in body surveillance, the more

likely they are to consider cosmetic surgery (Calogero et al., 2010; Jackson & Chen, 2015). Do sexualized media play a role here? It may be speculated that the answer is yes, as correlations have been found between appearance-focused television use and the acceptance of cosmetic surgery (Sharp et al., 2014; Slevec & Tiggemann, 2010). To date, there are no studies examining consideration of cosmetic surgery as an outcome of sexualized media and the three-step process of self-objectification, indicating the need for future research. This is especially important among the group of middle-aged women, as they are the biggest consumer group among people who undergo cosmetic surgery (American Society of Plastic Surgeons, 2018). This again highlights the importance of the inclusion of samples across a broad age spectrum, as research on sexualized media and self-objectification is limited towards samples of college age and younger.

3 Aims of the Doctoral Research

3.1 Superordinate Goals

The theoretical introduction in the previous sections aimed to illustrate that sexualized media play a role in how women and men see themselves. The exposure to well-shaped sexy ideals in the media has been argued to lead individuals to compare their physical appearance to others, to internalize the ideals shown by the media, and to value the appearance of their body over its competence. This disrupts people's behavior as they increasingly engage in surveilling their own body, checking it for its conformity to appearance standards. Body surveillance has been discussed and connected to various forms of severe health problems, like depression and disordered eating. The past sections of this dissertation served to introduce the theoretical foundation of the present PhD thesis, the relevant constructs for this research and the empirical associations between them. Furthermore, mediators, moderators and underlying mechanisms of these relations were discussed. As outlined in the theoretical sections, the literature on the relations between sexualized media and body image concerns has several gaps. The aim of this doctoral thesis is to go beyond the previous findings and to address aspects that have not yet been considered in the studies conducted so far. To achieve this aim, a diverse methodological approach was selected, consisting in one experimental study, two cross-sectional studies, and one longitudinal study. Specifically, the four studies included in this dissertation addressed the following main goals:

- 1) First, to provide further insights into the effects of nontraditional sexualized media on self-objectification by investigating the role of *interactive media* and *social media* (Study 1, Study 3, Study 4).
- 2) Second, to provide a better understanding of the relations between sexualized media and self-objectification among groups that have not or rarely been included so far, such as *females beyond college age* and *males*, investigating age and gender as moderators (Study 2, Study 3, Study 4).
- 3) Third, to gain more knowledge about potential *mediators* of the relation between sexualized media and self-objectification by investigating the role of thin-ideal internalization, muscular-ideal internalization, and appearance comparisons (Study 2, Study 3, Study 4).

For the first goal, an experimental study using a video game with a female sample was designed. Furthermore, a cross-sectional study measuring adolescents' sexualized social media

use was conducted. Both interactive and social media use was further examined in a two-wave longitudinal design among adolescents. With the longitudinal as well as the cross-sectional study, the second goal has been addressed as male adolescent samples were included in both designs. Additionally, another cross-sectional study was designed that investigated the relations between sexualized television use and self-objectification among women across a broad age spectrum, further tackling the second goal. Finally, for the third goal, mediators (thin-ideal and muscular-ideal internalization, appearance comparisons) were studied cross-sectionally and in the two-wave longitudinal design. In the following sections, specific goals and hypotheses of the four single studies are outlined.

3.2 Study Overview and Specific Goals

3.2.1 Study 1

The aim of the first study of this dissertation was to examine the effects of playing with a sexualized compared to a nonsexualized video game avatar on young women's body image concerns, additionally investigating underlying mechanisms as well as potential moderators of the proposed effects. Specifically, it was aimed to investigate features that are specific to interactive media because the respective research is limited. The first goal of this study was to conceptually replicate findings demonstrating an increase of women's self-objectification after the exposure to sexualized media (Karsay et al., 2018). Drawing on previous research, it was expected that playing with a sexualized avatar would cause an increase in women's state self-objectification (Fox et al., 2015; Vandenbosch et al., 2017).

A second goal of this study was to shed light on underlying processes that are specific to interactive media by investigating the effect of character sexualization on women's body satisfaction as a related outcome. A large body of research shows that the exposure to sexualization in traditional media leads to higher self-objectification and lower body satisfaction (Ward, 2016). Objectification researchers assume priming theory to explain the effects of sexualized images in traditional media on women's body image concerns (Aubrey et al., 2009; Karsay & Matthes, 2020). However, studies examining objectification theory within interactive media are rare, although the alleged effect might be different due to other underlying mechanisms. Building upon the theoretical considerations of the Proteus effect (Yee & Bailenson, 2007), women playing with sexualized avatars might embody its thin, well-shaped body which conforms to the media ideal and infer this appearance onto themselves. As a result, they might experience more body satisfaction. Following this reasoning, it was expected

women's body satisfaction to either increase (in case of the Proteus effect) or to decrease (in case of priming).

A third goal of this study was to investigate the moderating role of a core feature of interactive media: character personalization. Personalization has been shown to increase users' identification with the avatar (Turkay & Kinzer, 2014) and to lead to higher levels of aggressive behavior after violent gameplay (Fischer et al., 2010; Hollingdale & Greitemeyer, 2013). Within the framework of objectification theory, it was expected that personalization would increase the effect of sexualization on women's self-objectification and body satisfaction.

To study the hypotheses, a 2 (sexualization) x 2 (personalization) experiment was conducted using a sample of 262 female university students. A final goal of this study was to advance psychological research with regard to its methodology. This research was conducted as a registered report, which means that the theoretical considerations, the hypotheses and the design of the study were approved through peer-review before data collection. Only after having received in-principle acceptance of the respective journal, meaning that the study would be published regardless of the results, the experiment was conducted. This practice advances open science and the quality of psychological science.

3.2.2 Study 2

The focus of the second study was to examine the role of age in the relation between sexualized television exposure, self-objectification and consideration of cosmetic surgery in a sample of women across a broad age spectrum from 15 to 72 years. The theoretical framework for this study was provided by the three-step process of self-objectification by Vandenberg and Eggermont (2015) which posits that sexualized media predicts body surveillance indirectly via appearance-ideal internalization and valuing appearance. Direct paths are further assumed between sexualized media and valuing appearance and between appearance-ideal internalization and body surveillance. As previously noted, no study on media sexualization and self-objectification has included women beyond early adulthood, making the test of the three-step process of self-objectification among older women a major goal of this study. Following the rationale of the three-step process, it was predicted that sexualized television exposure would predict body surveillance indirectly via thin-ideal internalization and valuing appearance, via thin-ideal internalization, and via valuing appearance.

Moreover, the role of age was analyzed in this study as a second goal. Specifically, several research questions were addressed: It was hypothesized that higher age might be negatively linked to the variables of self-objectification, as previous research indicates (Clarke

& Korotchenko, 2011). Furthermore, there is the possibility that age strengthens the link between sexualized media exposure and self-objectification because women tend to become farer away from the beauty ideal conveyed in sexualized media with higher age (Slevec & Tiggemann, 2010). However, age might also weaken the link because women might identify less with the sexualized ideals in the media as they grow older (Clarke & Korotchenko, 2011). As there is no research on this question yet, no specific hypotheses were postulated.

Finally, this study aimed to examine whether consideration of cosmetic surgery is another outcome of sexualized media and self-objectification, a factor that has not been studied within the framework of objectification theory and media use. Drawing on previous research, it was predicted that consideration of cosmetic surgery is predicted by sexualized television exposure (Sharp et al., 2014) and indirectly via sexualized television exposure, thin-ideal internalization, valuing appearance and body surveillance (Jackson & Chen, 2015). Again, the role of age in this dynamic was analyzed. It was speculated that age might be positively related to consideration of cosmetic surgery, as suggested by previous research (Henderson-King & Henderson-King, 2005). Additionally, age might positively or negatively moderate the link between sexualized television exposure and consideration of cosmetic surgery for the same reasons as outlined above. No specific hypotheses were postulated as research on the topic is currently absent.

3.2.3 Study 3

The aim of the third study was to investigate the relations between adolescents' use of sexualized Instagram images and self-objectification while taking into account the gender of the sexualized subject on the image (female and male) and different forms of appearance-ideal internalization (thin- and muscular-ideal internalization). As social media are particularly used by adolescents (Pew Research Center, 2018), research documenting links between social media use and adolescents' body image concerns has increased rapidly in the recent years. Yet, studies are missing that specifically measure the habitual exposure to sexualization on social media. Tackling this issue was a major goal of this cross-sectional study which used a sample of adolescents between the age of 13 and 18 years. The platform Instagram was selected because it is currently the most popular platform among adolescents after WhatsApp (Medienpädagogischer Forschungsverbund Südwest, 2019) and is particularly known for its high prevalence of sexualized images (Deighton-Smith & Bell, 2018; Tiggemann & Zaccardo, 2018). As such, goals of this study were to test the applicability of three-step process of self-objectification to social media, and to test the proposed relations in a male sample.

A fourth goal was to differentiate the role of the proposed mediator of the relation between sexualized media and self-objectification: appearance-ideal internalization. As Western cultural standards promote muscularity for men and thinness for women (Moradi, 2010), both facets were included in this research. Shedding light onto the role of the gender of the sexualized subject on Instagram, the habitual exposure to both female and male sexualized images was measured. It was hypothesized that male sexualization on Instagram would predict muscular-ideal internalization and valuing appearance for boys, and female sexualization would predict thin-ideal internalization and valuing appearance for girls. For both genders, it was assumed that muscular- and thin-ideal internalization as well as valuing appearance would be connected to body surveillance. An indirect link was assumed between the use of the gender-congruent sexualization on Instagram (female for girls, male for boys) to body surveillance via thin-ideal internalization and valuing appearance for girls and muscular-ideal internalization and valuing appearance for boys.

3.2.4 Study 4

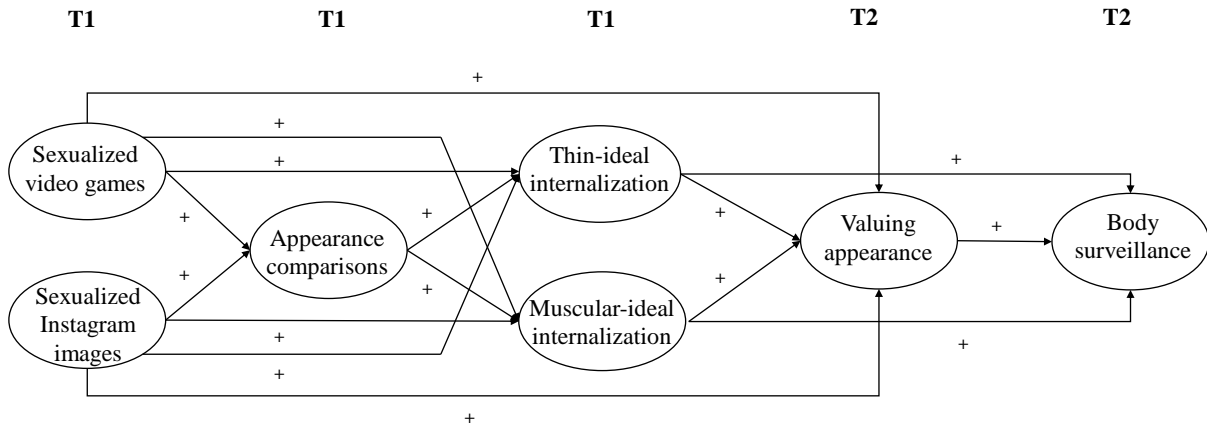
Longitudinal studies documenting links between sexualized media use and self-objectification are rare (Aubrey, 2006; Vandenbosch & Eggermont, 2015, 2016), and in the few existing studies, sexualized social has rarely (Vandenbosch & Eggermont, 2016) and sexualized interactive media has not been taken into account. Against this background, the fourth study of this dissertation aimed to analyze longitudinal relations between adolescents' sexualized video game and Instagram use and self-objectification, using structural equation modeling. Again, female and male samples were included to examine the possible moderating role of gender.

While several studies discussed the mediating role of appearance-ideal internalization in the link between sexualized media and self-objectification, cross-sectional studies have found that appearance comparisons might also play a role in the process (Fardouly et al., 2018; Fatt et al., 2019; Feltman & Szymanski, 2018). Extending this research by applying the findings in a longitudinal design within the framework of the three-step model of self-objectification was a further goal in this study. Theoretical considerations for the role of appearance comparisons were derived from sociocultural theory (Thompson et al., 1999), which posits that media use is one of three predictors (in addition to parents and peers) of body image concerns, and that this relation is mediated by appearance comparisons. Researchers on the theory postulate a direct path from appearance comparisons to appearance-ideal internalization (Keery et al., 2004). The conceptual model for the prediction of body surveillance in this study is shown in Figure 1. Because the study had only two data waves, several associations had to be modelled cross-

sectionally. Drawing on previous research, it was hypothesized that sexualized video game and Instagram use at Time 1 would predict greater valuing appearance at Time 2. Sexualized video game and Instagram use was expected to predict greater appearance comparisons, thin-ideal and muscular-ideal internalization. Furthermore, direct paths from appearance comparisons to thin-ideal and muscular-ideal internalization were proposed. Following the three-step process of self-objectification (Vandenbosch & Eggermont, 2015), it was expected that thin-ideal and muscular-ideal internalization at Time 1 would predict valuing appearance at Time 2. A direct path from valuing appearance to body surveillance was also hypothesized. At the same time, it was predicted that higher sexualized video game and Instagram use at Time 1 would indirectly increase body surveillance at Time 2 via valuing appearance, via thin-ideal or muscular-ideal internalization and valuing appearance, and via appearance comparisons, thin-ideal or muscular-ideal internalization, and valuing appearance. In the analysis, it was examined whether gender moderated the proposed relations.

Figure 1

Conceptual Model for the Prediction of Body Surveillance



4 Study 1: The effects of sexualized video game characters and character personalization on women's self-objectification and body satisfaction¹

Abstract

Female role models in video games are rare, and if they are present, they are often heavily sexualized. Objectification theory suggests that exposure to sexualized media characters increases self-objectification and decreases body satisfaction in female users. This study investigated the effect of playing a video game with a sexualized versus a nonsexualized character on women's experiences of self-objectification and body satisfaction. We further studied the effect of character personalization as a core feature of video games on the relation between sexualized avatars, self-objectification and body satisfaction. $N = 262$ female participants reported state self-objectification and body satisfaction after 30 min of playing the video game *The Sims 4* with a sexualized or nonsexualized avatar that was either generic or personalized to look like the participant. We predicted that controlling for trait self-objectification, playing the game with a sexualized character would increase state self-objectification, especially in the personalized condition. Regarding the effect of character sexualization on body satisfaction, competing hypotheses based on priming vs. the Proteus effect were tested, considering character personalization and enjoyment of sexualization as moderators and controlling for trait body satisfaction. The current study did not find evidence for the proposed hypotheses. The findings are discussed in terms of the relevance of objectification theory in explaining effects of sexualized models in interactive media.

Keywords: video games; sexualization; self-objectification; body satisfaction; character personalization, media effects

¹ Skowronski, M., Busching, R., & Krahe, B. (2021). The effects of sexualized video game characters and character personalization on women's self-objectification and body satisfaction. *Journal of Experimental Social Psychology*. Advance online publication. <https://doi.org/10.1016/j.jesp.2020.104051>.

Introduction

From the popular *Grand Theft Auto* series to fighting games such as *Street Fighter* or action adventures like *Bayonetta*, sexualized representations of women are common in contemporary video games (Downs & Smith, 2010). Numerous studies have documented the negative impact of sexualized images in traditional media, such as television and print advertisements, on how women perceive themselves and their bodies (Ward, 2016). However, the specific effects of interactive entertainment media remain largely understudied, although video games offer users a whole new experience compared to traditional media. Unlike passive media consumption, users can control and often personalize the depicted characters. These features make it more likely for users to feel immersed in the virtual environment and to identify with their character, leading to stronger effects compared to passively watching media characters (Konijn, Bijvank, & Bushman, 2007; Yee & Bailenson, 2009).

Our main goal in the current study was to examine the influence of sexualized female video game avatars on young women's self-objectification and body satisfaction, using the theoretical framework of objectification theory (Fredrickson & Roberts, 1997). We aimed to study underlying processes of media-induced self-objectification and body satisfaction within the context of interactive media by taking advantage of one particular feature of video games, namely the possibility to personalize a character. We predicted that character sexualization would increase self-objectification in female users, and that this effect would be more pronounced if they played the game with an avatar they had personalized to look similar to themselves. Regarding the effect of character sexualization on body satisfaction, competing hypotheses based on two possible underlying processes, priming versus Proteus effect, were tested by taking advantage of the personalization manipulation. In our proposed model, we tested the role of enjoyment of sexualization as a moderator and controlled for the influence of habitual self-objectification and trait body satisfaction.

Representations of Women in Video Games

Video gaming is one of the most popular forms of media entertainment, with around 25% of European citizens playing at least once a week (Interactive Software Federation of Europe, 2012). Also, the average age of video gamers is around 35 years (Entertainment Software Association, 2016), illustrating that video gaming is not only a leisure activity for children and adolescents anymore, and suggesting that studies on potentially harmful effects of gameplay should not focus solely on these young age groups. Over 40% of women in the U.S. and Europe play video games (Entertainment Software Association, 2016; Interactive Software Federation of Europe, 2012), which means that they are likely to be regularly exposed to images

of women presented in a sexualized way. According to the definition of the APA Task Force on the Sexualization of Girls (2007), sexualization occurs when a person's value comes only from his or her sexual appeal while ignoring other characteristics, when a person is treated as a sexual object, when sexuality is inappropriately imposed (e.g., in the case of children) and/or when a person's physical attractiveness equates his or her sexiness. Although female characters are strongly underrepresented in video games, they often appear heavily sexualized. In their analysis of 20 US top-selling games of 2003, Downs and Smith (2010) found that only 14% of all characters were female. Of these, 41% appeared in sexually revealing clothing, and 43% were depicted partially or fully nude, compared to 11% and 4% of the male characters, respectively. Females were also more likely than males to be shown with unrealistic body proportions (25% vs. 2%). This pattern is consistent with several content analyses documenting the sexualization of female video game characters, particularly in top-selling games (Beasley & Collins Standley, 2002; Burgess, Stermer, & Burgess, 2007; Dill & Thill, 2007; Lynch, Tompkins, van Driel, & Fritz, 2016). Williams, Martins, Consalvo, and Ivory (2009) have argued that games and gender work as a cycle, with women being less attracted by games that do not represent them, thus being less likely to become gamemakers and changing the status quo. Sexualization of video game characters might be a contributing factor to this cycle, keeping women from playing games where they find themselves under- and misrepresented (Hartmann & Klimmt, 2006). Supporting this rationale, sexualization of female characters tends to be lower among game genres most popular with women (Lynch et al., 2016). In the light of these studies and statistics, it is crucial to explore the effects of sexualized female role models in video games on female players. To date, there is only a limited number of studies on the topic, and few of them have examined features that are specific to interactive media.

Sexualized Media and Self-Objectification

Objectification theory (Fredrickson & Roberts, 1997) offers a theoretical framework for describing how exposure to sexually objectified women in the media may impact women's thoughts and feelings about their body. The theory states that women in Western culture learn from an early age that their body is looked at and evaluated by others. According to Fredrickson and Roberts (1997), the media play a critical role in delivering this message to women on a daily basis, for example through commercials and advertisements that focus solely on women's sexual attractiveness. The authors postulate that women gradually internalize this observer perspective and learn to evaluate themselves from an outside, third-person point of view based on their appearance. This process is described as *self-objectification* and has been linked to numerous negative outcomes for women, such as body shame (Calogero, 2004; Slater &

Tiggemann, 2010) and disordered eating (Calogero, Davis, & Thompson, 2005; Tiggemann & Williams, 2011). Although Fredrickson and Roberts' theory (1997) was originally designed to explain effects of sexually objectifying experiences, media scholars have used the theory in a broader sense to include other forms of sexualization in the media and their impact on women's self-objectification. Correlational studies have shown that self-objectification is positively related to exposure to sexualized content in television, print media, music television and social networking sites (Aubrey, 2006; Morry & Staska, 2001; Vandebosch and Eggermont, 2012, Vandebosch and Eggermont, 2015). However, only a limited number of studies have examined experimentally whether exposure to sexualized media has a causal effect on women's self-objectification (Halliwell, Malson, & Tischner, 2011; Karsay & Matthes, 2020; Linder & Daniels, 2018). Moreover, despite the prominence of sexualized female characters in video games, the potential effects of video games on self-objectification and related outcomes remain understudied. This is especially remarkable because interactive media differ from traditional media in several ways that could have different effects on women's self-objectifying behavior. First evidence suggests that playing video games with sexualized avatars leads to higher self-objectification than playing with a nonsexualized avatar (Fox, Ralston, Cooper, & Jones, 2015; Vandebosch, Driesmans, Trekels, & Eggermont, 2017). Yet to date, limited research has examined the underlying mechanisms of this relation. The current study was designed to study the impact of sexualization within the context of interactive media, using a video game that is highly popular among women, *The Sims 4*. Drawing on previous research, we expected that women playing the game with a sexualized avatar would report higher levels of self-objectification than women playing the game with a nonsexualized avatar. Going beyond this conceptual replication, we sought to study underlying processes that are specific to interactive media by examining the influence of character sexualization on a related outcome variable, namely women's body satisfaction. In addition, we examined the moderating role of character personalization on the effects of the sexualization manipulation.

Sexualized Video Game Characters and Body Satisfaction

Previous studies that examined the impact of sexualized video game avatars within the framework of objectification theory focused on self-objectification or attitudes like rape myth acceptance and sexism as dependent variables (Fox et al., 2015; Read, Lynch, & Matthews, 2018; Vandebosch et al., 2017). However, objectification theory further suggests that the exposure to objectifying experiences raises not only women's level of self-objectification but also their concerns about their body (Calogero, 2004; Fredrickson, Roberts, Noll, Quinn, & Twenge, 1998; Hebl, King, & Lin, 2004). Media depicting women in sexualized ways constitute

one of the most common forms of how women experience objectification on a daily basis (Fredrickson & Roberts, 1997). Sexualized media images convey standards of physical attractiveness in the form of thin and well-shaped models that most women are unlikely to meet. Many studies have shown that exposure to mass media depicting the thin ideal is associated with lower levels of body satisfaction (Grabe, Ward, & Hyde, 2008). There is also substantial experimental evidence that sexualized media images in television, magazines and advertisements have negative effects on body satisfaction (Halliwell et al., 2011; Mulgrew & Hennes, 2015; Prichard & Tiggemann, 2012). Accordingly, it seems likely that playing video games with sexualized avatars will also affect women's body satisfaction. To date, only few studies have empirically examined the relation between female video game avatars and body satisfaction. Barlett and Harris (2008) compared women's body esteem, a concept positively linked to body satisfaction (Tiggemann & Lynch, 2001), before and after playing video games featuring women with idealized body shapes. They found that women reported lower body esteem after gameplay. Yet they did not manipulate character sexualization, and there was no control group allowing for a direct comparison between sexualized and nonsexualized characters. In another study, Matthews, Lynch, and Martins (2016) let participants play different video games with either realistic or hyper-idealized female characters and found that women playing with hyper-idealized avatars reported greater body satisfaction. The hyper-idealized characters had highly exaggerated body proportions, a criterion for visual sexualization used by content analyses (Downs & Smith, 2010; Lynch et al., 2016). It is important to note that the study focused on the manipulation of the degree of realism of the main character. As the authors argue, female participants might have perceived the extremely exaggerated character as ridiculous, thus engaging in downward comparison. Furthermore, different games were used in the study, which could also have influenced the outcomes. More research is needed to clarify the impact of sexualization in video games on body satisfaction. Therefore, another objective of the current study was to fill this gap by manipulating avatar sexualization within the same game. Whereas using multiple games increases generalizability, the use of a single game facilitates better experimental control by making sure the versions of the game differ only with regard to the sexualization manipulation.

Underlying Mechanisms: Priming or Proteus Effect?

By measuring body satisfaction as an outcome, we aimed to further explore underlying processes which may be unique within the context of interactive media. Previous research on objectification theory has used priming theory to explain the effects of sexualized media characters on women's self-objectification (Karsay & Matthes, 2020; Vandenbosch et al.,

2017). Exposure to sexualized female images should serve as primes, activating women's thoughts about appearance to make them more accessible when evaluating their own body (Aubrey, Henson, Hopper, & Smith, 2009). Because sexualized characters are presented in an idealized form that most women cannot meet, the elicited thoughts about their own bodies are likely to be negative. In traditional media, people see *someone else* sexualized. Interactive media, by contrast, have exclusive characteristics that may affect the way sexualized female images impact women's thoughts and feelings about their bodies: When playing video games, users take over the role of a character and might perceive it, and therefore its sexualization, as part of *themselves*. They embody the virtual avatar and its salient characteristics, a process that has been described as the Proteus effect (Yee & Bailenson, 2007). The Proteus effect means that people infer their expected behavior and attitudes from characteristics of their avatar in a virtual world. It builds on self-perception theory (Bem, 1972), which proposes that individuals infer their attitudes and beliefs from observing their own behaviors. In a video game environment, self-perception is particularly easy as users navigate themselves as virtual avatars, and the avatar becomes the main identity cue. Yee and Bailenson (2007) suggest that users embody the avatar, observe themselves in the virtual world, and then draw conclusions about their own self based on their virtual characters. In line with this reasoning, participants were shown to be more confident in a negotiation task when having embodied a taller avatar, or friendlier when having embodied an attractive avatar (Yee & Bailenson, 2007; Yee, Bailenson, & Ducheneaut, 2009). This aspect of interactive media could reverse the previously proposed priming effects of sexualizing media and may have intriguing implications for the outcomes of media sexualization. If the effect of character sexualization on women's body satisfaction was driven by priming, we would expect exposure to sexualized female images to lower women's body satisfaction. However, when assuming the Proteus effect as the primary underlying mechanism, women who embody a sexualized character should assimilate its sexy appearance to their own appearance, resulting in heightened body satisfaction. This means that in the context of interactive media, the effects of sexualization found in traditional media could be different. The study by Matthews et al. (2016), where greater body satisfaction among women playing with hyper-idealized video game avatars was found, is consistent with this reasoning. Based on these considerations, we put forward competing predictions regarding the effect of playing a videogame with a sexualized avatar on women's body satisfaction. Based on the priming account, we expected to find a *negative* effect of sexualization on body satisfaction. Yet if the Proteus effect played a more decisive role, playing the sexualized avatar should result in *higher* body satisfaction compared to playing the nonsexualized avatar. Some women may

not see sexualized portrayals of themselves as desirable. For these women, the Proteus effect might not result in a positive change in body satisfaction. McCain, Ahn, and Campbell (2018) suggest that individuals may specifically take on desired aspects of their avatars, while distancing themselves from undesired ones. Thus, it seems plausible that the Proteus effect would be particularly relevant for women who enjoy being sexualized. Women who enjoy sexualization should assimilate to the sexualized avatar's characteristics more readily, resulting in a greater positive effect on body satisfaction. For women who enjoy sexualization less, body satisfaction might not increase since they do not see the sexualized avatar as a desirable figure. Following this reasoning, we assessed enjoyment of sexualization (Liss, Erchull, & Ramsey, 2011), which could be an important moderator of the Proteus effect.

With regard to the impact of avatar sexualization on self-objectification, priming and Proteus mechanisms should both lead to the same effect. From the perspective of the Proteus effect, women transfer the salient characteristics of their avatar onto their self. If these salient characteristics are appearance-focused, like in the case of the sexualized character, women should become more aware of their own appearance. Since women perceive the character as themselves, seeing the character from a third-person perspective while gaming exactly represents the process of self-objectification. Thus, the Proteus effect should cause women to self-objectify more strongly. If priming was assumed as the main underlying mechanism, it should also lead to stronger self-objectification when presented with a sexualized avatar. Thus, findings demonstrating greater self-objectification after exposure to sexualized avatars (Fox et al., 2015) are compatible with both explanations. In apparent contradiction to this line of reasoning, one study by Read et al. (2018) failed to find an increase in self-objectification when avatar sexualization within a role adventure game was manipulated (Read et al., 2018). As Read et al. (2018) argued, participants might have linked the physical attributes of their avatar more to strength and competence than to sexualization, thus shifting the focus from body appearance to body competence. This explanation, proposed by the authors in relation to priming effects, also makes sense in the context of the Proteus mechanism: If the avatar's body competence was perceived as salient, participants should mainly infer this characteristic for their self, explaining why no effects on self-objectification was found.

So far, minimal research has addressed the Proteus effect as an underlying mechanism of self-objectification and related outcomes in interactive media (Fox, Bailenson, & Tricase, 2013). This study has been conducted using a fully immersive virtual environment where participants used head-mounted displays – devices that most video game players do not use (Vandenbosch et al., 2017). Therefore, it is critical to study the Proteus effect in the context of

everyday video gameplay, as it might imply consequences that are specific to this medium. To examine the conditions under which a Proteus effect should be more likely, we manipulated users' possibility to personalize their avatar in addition to the manipulation of avatar sexualization.

Character Sexualization, Character Personalization and Body Satisfaction

Video games allow their users to have an influence over many aspects – controlling the story of the game, controlling the actions of the character, and often also personalizing the character's appearance. Personalization means that players can directly modify their character's face to make it look more like themselves. This core feature of modern video games has been shown to increase users' identification with their avatar (Hollingdale & Greitemeyer, 2013; Konijn et al., 2007; Turkay & Kinzer, 2014). Furthermore, studies have shown that playing a personalized compared to a generic avatar leads to higher levels of aggressive behavior after the exposure to violent video games (Fischer, Kastenmüller, & Greitemeyer, 2010; Hollingdale & Greitemeyer, 2013) and to higher levels of spontaneous helping behavior following cooperative gameplay (Dolgov, Graves, Nearents, Schwark, & Brooks Volkman, 2014). In the context of objectification theory, playing a personalized sexualized character might exacerbate the effects of avatar sexualization on women's thoughts about their body. A personalized character might convey more self-relevant information to women, thus leading them to self-objectify more strongly. Therefore, we assumed that personalizing the game character to look similar to the self would lead to greater effects of character sexualization on self-objectification and body satisfaction. Regarding the effect of character sexualization on body satisfaction as our second outcome variable, manipulating personalization allowed us to further explore the competing theoretical assumptions based on priming vs. the Proteus effect. As outlined above, a priming explanation would suggest that women exposed to the sexualized avatar would report lower body satisfaction than women exposed to the nonsexualized avatar. The Proteus effect would suggest the opposite effect. Beyond deciding between the two explanations based on the effects of our sexualization manipulation, the personalization manipulation enabled us to offer additional theoretical underpinning to the observed effects. We proposed that personalization should intensify the Proteus effect. Studies have demonstrated that personalizing an avatar leads people experience greater feelings of embodied presence in the game (Bailey, Wise, & Bolls, 2009; Ng & Lindgren, 2013; Schmierbach, Limperos, & Woolley, 2012; Turkay & Kinzer, 2014). The embodiment of a character and the subsequent assimilation of characteristics of the avatar to the self is exactly what the Proteus effect relies on (Yee & Bailenson, 2007). Accordingly, playing a sexualized avatar that is personalized to look similar to the player should

facilitate the embodiment of the character. Thus, if we found a stronger positive effect of character sexualization on body satisfaction in the personalized compared to the nonpersonalized avatar condition, this would corroborate an interpretation in line with the Proteus effect. If we found a negative effect of character sexualization regardless of personalization or in both personalized and nonpersonalized conditions in different magnitudes, this would be consistent with an explanation in terms of priming. The proposed associations are shown in Figure 1.

To our knowledge, no study has yet addressed the effect of character personalization on the relation between sexualized characters, self-objectification and body satisfaction. Fox et al. (2015) used avatars whose face looked either similar or not similar to the participants, which did not moderate the outcomes on self-objectification. However, in their study personalization was carried out by the researchers and not by the participant, so that participants were not free to choose their own facial characteristics. If players personalize their characters themselves, it requires them to think about their self and how they want it to be represented in their character. During this process, the avatar becomes more self-relevant and the players relate the figure more to their self. Personalization carried out by a third person seems a weak manipulation because it does not necessarily render its similarity and connection to the participant salient. Furthermore, research suggests that people more often create avatars to reflect their ideal self (Bessière, Seay, & Kiesler, 2007) and that people who project their ideal self have a higher attachment to their avatar (Ducheneaut, Wen, Yee, & Wadley, 2009), which supports the assumption that creating avatars to look similar to themselves is different from being assigned to a similar-looking character created by someone else. Based on these considerations, we proposed the following hypotheses:

Hypotheses based on both the priming and the Proteus explanation

H1. Women who play a video game with a sexualized avatar will report higher levels of self-objectification than women playing the game with a nonsexualized avatar.

H2. Playing with a personalized avatar will augment the effect of sexualization on women's self-objectification.

Hypotheses derived from the priming explanation

H3.1. Women playing a video game with a sexualized avatar will report lower body satisfaction than women playing with the nonsexualized avatar.

Hypotheses derived from the Proteus explanation

H3.2. Women playing a video game with a sexualized avatar will report higher body satisfaction than women playing with the nonsexualized avatar.

H4. If the sexualization of the avatar increases women's body satisfaction, the Proteus effect suggests that the effect should be stronger in the personalized than in the nonpersonalized condition.

RQ: Will the positive effect of character sexualization and personalization on body satisfaction be moderated by women's enjoyment of sexualization?

To strengthen the power of our experimental approach, we controlled for two dispositional variables linked to individual differences in women's susceptibility to sexualized media effects: trait self-objectification (Fredrickson & Roberts, 1997) and trait body satisfaction (Posavac, Posavac, & Posavac, 1998).

Method

In these studies, we report all measures, manipulations and exclusions.

Pilot Study

An online pilot study with 77 female participants (mean age of $M = 23.95$ years, $SD = 2.81$) was conducted to select the video game stimuli. Images of female avatars of various video games were selected to create a sexualized and a nonsexualized version, and each participant rated one version on the following 7-point semantic differential scales: sexy/not sexy, suggestively dressed/conservatively dressed, scantily dressed/fully dressed, realistically proportioned/unrealistically proportioned, sexualized/not sexualized, dissimilar to me/similar to me, unattractive/attractive, unathletic/athletic.

Results revealed that the video game *The Sims 4* (2014) was most suitable for the main experiment. The sexualized avatar was rated as significantly more sexualized, $t(75) = 13.94$, $p < .001$, more suggestively dressed, $t(75) = 16.12$, $p < .001$, more scantily dressed, $t(75) = 32.74$, $p < .001$, more unrealistically proportioned, $t(75) = -3.41$, $p = .001$, and sexier, $t(75) = 3.72$, $p < .001$, than the nonsexualized character. The two avatar versions did not differ in terms of perceived similarity, attractiveness and athletic appearance, all $ps > .56$. Only competence scores differed significantly, with the sexualized avatar being judged as less competent, $t(75) = -5.46$, $p < .001$. Yet this was true for almost all sexualized avatars included in the pilot study. For this reason, we decided to include perceived competence of the avatar in the main experiment as a control variable. The means of participants' ratings of all avatars are

presented in Table S1 on the OSF website (<https://osf.io/9krwt/>)². Pictures representing the avatar chosen for the main study are also available on the OSF (<https://osf.io/8496w/files/>).

Main Experiment

Participants

We aimed to recruit 260 participants. This number was determined by a power analysis including all assessed variables based on previous research, using small to medium effect sizes and adequate error probabilities ($\alpha = .05$, $\beta = .90$). The details of the power analysis and the complete syntax for generating as well as analyzing the data were pre-registered and can be found on the OSF website (<https://osf.io/2yeuk/>). We exceeded the proposed number by 14, with 274 female students at two German universities participating in the experiment. Five participants were excluded from the analyses due to disturbances in the experimental procedure (e.g., in-game pictures were not saved, participant went to the toilet during gameplay, participant did not play the game for the first 5 min, participant met another avatar during gameplay), three because they indicated that they were very distracted from the game navigation (level of distractedness exceeded the value 4, ranging from 1 to 5), and four because their online data could not be matched to the lab data. The final sample of $N = 262$ ranged in age from 17 to 45 years ($M = 22.95$, $SD = 4.70$). Participants reported low previous gaming experience ($M = 1.61$, $SD = 0.87$, range: 1–5) and low experience with playing *The Sims* ($M = 1.30$, $SD = 0.61$, range: 1–5). Participants received course credit or financial compensation for their participation.

Video Game Stimuli: The Sims 4

The Sims 4 is a life simulation video game where players create virtual avatars, place them in houses, and satisfy their mood and desires. Users can build houses for their characters, form relationships, choose a career and engage in various activities (e.g., drawing, reading, cooking, studying). Advantages of the game are that it does not contain violence and is easy to use even without gaming experience. Several steps were taken to ensure that the experimental manipulations of sexualization and personalization would be successful: First, the game was set up so as to maximize exposure to the avatar. A house already furnished was provided so that participants did not spend time building a house for their avatar. Several tasks were provided for the participants that could be accomplished via different ways, but excluded sexualized activities (e.g., flirting). Examples for the tasks are “Teach your dog three different tricks” or “Increase the level with an instrument of your choice”. This ensured that participants' activities

² The supplementary material of this study can be found online via the OSF links mentioned in this article.

were similar without losing the aspect of gaming and diminished potential effects of some participants' previous gaming experience with *The Sims*. Third, contact with other game characters was ruled out by allowing participants to choose from tasks that did not involve interaction with in-game random characters to prevent them from being exposed to other avatars. We further enabled the “private mode” of the avatar's house in the game to prevent other characters from appearing. Second, avatar personalities were held constant for all participants. Through giving participants tasks that required attention and a closer perspective (e.g., playing with the dog), we ensured that they focused on the manipulation. Additionally, they got the task to take an in-game photo of their avatar accomplishing the tasks that had been given to them.

Instruments

State Self-Objectification.

State self-objectification was measured with the Twenty Statements Test (TST; Fredrickson et al., 1998). The TST is composed of a series of incomplete statements beginning with the sentence “I am ____.” Participants were asked to fill in the blanks. Responses were coded as to whether they were based on appearance (e.g., “I am tall”) or other aspects (e.g., “I am a student”). The number of appearance-based responses determined each participant's self-objectification score. Two trained research assistants, blind to the participants' experimental condition, independently coded participants' answers to establish sufficient intercoder reliability. The coders then discussed the differences until they reached agreement. Intercoder reliability prior to reaching a consensus was excellent, Cohen's $\kappa = .98$. A list of the words and codings is provided on the OSF website (<https://osf.io/rk6wm/>), with words that triggered discussion marked.

Body Satisfaction.

Body satisfaction was measured with the Body Dissatisfaction subscale of the Eating Disorder Inventory-3 (Garner, 2004). The scale consists of ten items (e.g., “I feel satisfied with the shape of my body”), which are rated on a 5-point scale ranging from 1 (*never*) to 5 (*always*). Thirty filler items were included asking about cognitive abilities and life satisfaction to mask the purpose of the study. Participants reported body satisfaction one week prior to the experiment (trait) and immediately after the manipulation (state). In the first case, they were told to indicate how much they agreed with the statements *in general*, yielding a measure of trait body satisfaction. After the manipulation, they were told to indicate how much they agreed

with the items *right now*. Internal consistency was good for both the trait (Cronbach's $\alpha = .89$) and the state version (Cronbach's $\alpha = .89$).

Video Game Perception.

To account for differences in participants' feelings about their gaming experience, seven items assessed their perception of the video game they had played. Participants indicated to what degree they perceived the game as violent, involving, exciting, boring and easy to use, and how much they had felt distracted by game controls, using a 5-point scale ranging from 1 (*not at all*) to 5 (*very much*). Three cover items were included asking about cognitive demands of the game to mask the purpose of the study. In addition, participants reported the perceived competence of the avatar with the same scale. Furthermore, they indicated previous gaming experiences and experience with playing *The Sims*, using 5-point scales from 1 (*never*) to 5 (*almost every day*). Measures that differed between experimental conditions were included as covariates in the hypotheses-testing analyses.

Trait Self-Objectification.

This construct was assessed by the Self-Objectification Questionnaire (SOQ; Noll & Fredrickson, 1998), which measures the importance of body appearance versus competence. Participants were asked to rank ten body attributes from 9 (most important) to 0 (least important) for their bodily self-concept. Five of the attributes were appearance-based (e.g., weight, sex appeal), and five were competence-based (e.g. health, stamina). The difference between the total appearance ranking and the competence ranking determined the participant's trait self-objectification score, with higher scores indicating higher levels of trait self-objectification.

Enjoyment of Sexualization.

To assess the extent to which participants seek and enjoy self-sexualization, the Enjoyment of Sexualization Scale (Liss et al., 2011) was used. The scale consists of eight items (e.g., "I like showing off my body"), which were rated on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Internal consistency was good (Cronbach's $\alpha = .83$).

Manipulation Check.

One item from the pilot study served as a manipulation check for sexualization by asking participants how suggestively dressed they believed the avatar to be. Concerning personalization, the three highest loading items on each of the two subscales of the Player Identification Scale (van Looy, Courtois, Vocht, & Marez, 2012) were used: the Similarity

Identification subscale (e.g., “I identify with my character”), and the Embodied Presence subscale (e.g., “When I am playing, it feels as if I am my character”). Items were rated on a 5-point scale ranging from 1 (*not at all*) to 5 (*very much*). Internal consistency was adequate for the Similarity Identification (Cronbach's $\alpha = .71$) and good for the Embodied Presence subscale (Cronbach's $\alpha = .81$).

Procedure

The experiment was presented as an investigation of the effect of video-game play on cognitive performance. At least one week prior to the experiment, participants completed an online survey to assess demographics, enjoyment of sexualization, trait self-objectification, and trait body satisfaction. The second part of the study was lab-based. Upon arriving at the lab, participants were randomly assigned to one of four conditions: Sexualized/personalized ($n = 65$), sexualized/nonpersonalized ($n = 68$), nonsexualized/personalized ($n = 64$), and nonsexualized/nonpersonalized ($n = 65$). Participants in the personalized conditions were instructed to personalize the face of their avatar to make it look like themselves. Five minutes were allowed for this task. Participants in the nonpersonalized groups played the game with the face used in the pilot study. *The Sims 4* allows players to modify numerous aspects of the face (e.g., hairstyle, hair color, skin color, eyes, lips), without seeing the body of the avatar, so that participants in the personalized conditions did not spend more time exposed to the character's body than the other groups. All participants received headphones and a handout sheet with the most important functions and controls in the video game. They were then instructed how to play the video game on a PC and played the game for 5 min to familiarize themselves with the virtual environment. Participants were informed that their skill level would not be assessed.

Following the practice session, participants were given tasks to complete during the game and then played the game alone for 25 min. After gameplay, participants completed the state self-objectification and body satisfaction measures. Next, the participants were given 5 min to complete Raven's progressive matrices (Raven & Court, 1962) as cover items consistent with the alleged purpose of the study. Finally, participants' perception of the video game, manipulation check questions and control variables were assessed. The experimenter then probed participants' suspicion before they were fully debriefed and thanked. The instruments and procedure were approved by the Ethics Committee of the authors' university.

Results

The full analyses scripts for planned and exploratory analyses and the full dataset are available on the OSF website (<https://osf.io/8496w/files/>).

Planned Analyses

Preliminary analyses were carried out with SPSS 26, main analyses with Mplus 8.4.

Missing Data

Data of participants who only completed the online session but did not show up for the lab session were deleted. For the data included in the study, 4.6% of the data points were missing. As planned, we used listwise deletion for the preliminary analyses in SPSS and robust maximum likelihood estimation for handling missing data in the main analyses in Mplus.

Preliminary Analyses

Using three MANOVA analyses with the two manipulations and their interaction as independent variables, we tested if the four experimental groups differed on (a) the manipulation check items, (b) individual and trait variables (enjoyment of sexualization, trait self-objectification, trait body satisfaction, previous gaming experience and *The Sims* gaming experience) and (c) the individual items assessing the perception of the game (e.g., perceived violence, excitement, perceived competence of the avatar). Concerning the manipulation check, one item served as the manipulation check for sexualization and two scales as the manipulation check for personalization. Significant multivariate effects were found for sexualization, $F(3,256) = 163.29, p < .001$, Wilk's $\lambda = .34$, partial $\eta^2 = .66$, personalization, $F(3,256) = 8.29, p < .001$, Wilk's $\lambda = .91$, partial $\eta^2 = .09$, and their interaction, $F(3,256) = 3.95, p = .01$, Wilk's $\lambda = .96$, partial $\eta^2 = .04$. There was a significant univariate effect of the sexualization manipulation on the respective manipulation check item, $F(1,258) = 482.77, p < .001$, partial $\eta^2 = .65$, with higher scores in the sexualized conditions ($M = 3.87, SD = 1.22$) than in the nonsexualized conditions ($M = 1.27, SD = 0.67$). Additionally, there was a univariate interaction effect between sexualization and personalization on the sexualization manipulation check item, $F(1,258) = 10.69, p = .001$, partial $\eta^2 = .04$, such that participants rated their sexualized character to be more suggestively dressed in the personalized ($M = 4.20, SD = 0.94$) than in the nonpersonalized group ($M = 3.56, SD = 1.35$). We can therefore assume that the sexualization manipulation worked. Concerning personalization, we had two manipulation check scores: similarity identification with the character and embodied presence. For similarity identification, the univariate effect of personalization was significant, with participants in the personalized condition reporting more similarity identification with the character ($M = 2.43, SD = 0.82$) than did those in the nonpersonalized condition ($M = 2.09, SD = 0.92$), $F(1,258) = 10.10, p = .002$, partial $\eta^2 = .04$. There was no univariate interaction effect between personalization and sexualization for similarity identification, $F(1,258) = 0.02, p = .90$, partial $\eta^2 = .00$. For embodied presence, the univariate effect of personalization was nonsignificant,

$F(1,258) = 1.01, p = .32, \text{partial } \eta^2 = .00$, which means that participants in the personalized condition did not experience greater character embodiment ($M = 1.77, SD = 0.88$) than those in the nonpersonalized condition ($M = 1.88, SD = 0.87$). The univariate interaction between personalization and sexualization was also nonsignificant, $F(1,258) = 0.36, p = .55, \text{partial } \eta^2 = .00$. Although greater similarity identification indicates that the personalization manipulation worked, the lack of differences for embodied presence warrants caution in interpreting the effects of this manipulation.

The second MANOVA examined the individual-difference and trait variables. No differences in these variables were found in the four groups defined by the combination of sexualization, $F(5,254) = 0.33, p = .90, \text{Wilk's } \lambda = .99, \text{partial } \eta^2 = .01$, and personalization, $F(5,254) = 0.58, p = .71, \text{Wilk's } \lambda = .99, \text{partial } \eta^2 = .01$, and no interaction effect emerged, $F(5,254) = 2.09, p = .07, \text{Wilk's } \lambda = .96, \text{partial } \eta^2 = .04$. Finally, concerning differences on the items measuring perceptions of the game and perceived character competence, no main effects were found for sexualization, $F(7,250) = 0.61, p = .75, \text{Wilk's } \lambda = .98, \text{partial } \eta^2 = .02$, or personalization, $F(7,250) = 0.64, p = .72, \text{Wilk's } \lambda = .98, \text{partial } \eta^2 = .02$, and no interaction effect emerged, $F(7,250) = 1.80, p = .09, \text{Wilk's } \lambda = .95, \text{partial } \eta^2 = .05$.

Table 1 provides means, standard deviations and intercorrelations of all variables in the path model. There was a significant positive correlation between state and trait body satisfaction, but no significant correlation between state and trait self-objectification. Trait self-objectification correlated negatively with state and trait body satisfaction. Enjoyment of sexualization correlated positively with trait body satisfaction and trait self-objectification, but not with the state variables.

Hypotheses Testing

To test our hypotheses, we used structural equation modeling with a robust maximum likelihood estimation using Mplus. The two independent variables (sexualized vs. nonsexualized, personalized vs. nonpersonalized avatars) were entered as predictors for the dependent variables of state self-objectification and state body satisfaction. Furthermore, the three-way interaction of the independent variables and the moderator (enjoyment of sexualization) were entered as predictors. Trait variables were entered as covariates predicting the dependent variables. All variables were included as manifest variables. The correlation between the dependent variables is set as a default in Mplus. The model had an excellent fit with the data, $\chi^2 (df = 4, N = 262) = 2.64, p = .62, CFI = 1.00, RMSEA = 0.00, SRMR = 0.01$. The results are presented in Figure 2.

We expected women who played the video game with a sexualized character to report higher self-objectification compared with women who played with a nonsexualized character (H1). This hypothesis was not supported, $b = -0.03$, $t = -0.44$, $p = .66$, $\beta = -0.03$. The hypothesis that personalization would increase this proposed effect (H2) was also not supported, $b = -0.08$, $t = -1.33$, $p = .19$, $\beta = -0.08$. These two hypotheses were based on both the priming and Proteus explanations. Testing our third hypothesis, which stated that playing with a sexualized compared with a nonsexualized avatar would either lower body satisfaction (priming explanation, H3.1) or increase body satisfaction (Proteus explanation, H3.2), revealed no evidence for either of the hypotheses, $b = -0.16$, $t = -1.61$, $p = .11$, $\beta = -0.18$. Also, this effect was not moderated by personalization, $b = -0.09$, $t = -0.89$, $p = .37$, $\beta = -0.10$, not supporting our fourth hypothesis (H4). We finally tested our research question about whether the proposed positive effect of character sexualization and personalization would be moderated by women's enjoyment of sexualization (RQ), but found no evidence of such a moderation effect in our data, $b = 0.02$, $t = 0.52$, $p = .60$, $\beta = 0.06$.

Exploratory Analyses

Given the nonsignificant findings of our frequentist analyses, we conducted Bayesian t -tests for our three central predictions (H1, H3.1 and H3.2: effects of sexualization on self-objectification, and body satisfaction). Bayesian analyses allow researchers to test the likelihood of either the null or the alternative hypothesis. The Bayes factor (BF) compares the probability of the data under one model with the probability under another model and provides evidence in favor of either the null hypothesis (BF_{01}) or the alternative hypothesis (van de Schoot & Depaoli, 2014). Analyses were conducted using the jsq module of Jamovi 1.2.11. jamovi (Version 1.2) [Computer Software]. Retrieved from <https://www.jamovi.org>. We used the effect size estimates of our power analysis as priors (normal distribution with $\mu = 0.2$, $SD = 1$). Concerning the effect of sexualization on self-objectification (H1), the analysis revealed that given the data, the model without an effect is about eight times more likely than the model including the hypothesized effect, $BF_{01} = 7.86$. For the effect of sexualization on body satisfaction (H3.1 and H3.2), the analysis showed that given the pattern of data, the null hypothesis is about six times more likely than the model with the hypothesized effect, $BF_{01} = 5.63$. In sum, these analyses showed that there was moderate support for the null

hypotheses over the alternative hypotheses based on the interpretation by Wagenmakers et al. (2018).¹

A further exploratory finding concerns the enjoyment of sexualization as a moderating variable. As outlined above, we did not find the predicted three-way interaction of sexualization, personalization and enjoyment of sexualization on body satisfaction. However, in our planned model, we found a significant two-way interaction effect of sexualization and enjoyment of sexualization on body satisfaction, $b = 0.07$, $t = 1.99$, $p = .047$, $\beta = 0.22$. That is, women who enjoy sexualization more reported more body satisfaction after playing a sexualized as compared to a non-sexualized avatar, both in the personalized and the nonpersonalized conditions. A figure showing this exploratory result is available on the OSF website (<https://osf.io/nyswa/>).

Discussion

This study failed to replicate previous findings showing that playing a sexualized video game avatar increases women's self-objectification (Fox et al., 2015; Vandebosch et al., 2017). Avatar sexualization had no main effect on women who played the video game *The Sims 4*, which was supported by additional exploratory Bayesian analysis demonstrating moderate support for the null hypothesis. This result is at odds with previous studies using other games that also manipulated character sexualization in the same game (Fox et al., 2015; Vandebosch et al., 2017). Whereas participants in the studies by Fox et al. (2015) did not engage in actual gameplay, the participants in the study by Vandebosch et al. (2017) played a popular online game (*RuneScape*).

However, a null effect was found in one other study where participants played a popular game (*The Elder Scrolls V: Skyrim*) with character sexualization manipulated (Read et al., 2018). This study is the only one apart from the present experiment that used pre-registration, conducted an a-priori power analysis and collected data from a large sample. In line with this rigorously conducted study, our findings suggest that there may be no short-term effect of sexualization in video games on self-objectification. It might be possible that effects of sexualized avatars only occur when users interact with other characters in the game, which was prevented in this study to enhance experimental control. The presence of others increases self-objectification (Calogero, 2004), and in the studies by Fox et al. (2015) and Vandebosch et al. (2017), participants interacted with other human-like characters during the experiment, whereas

¹ When conducting the Bayesian analyses with the Jamovi default non-informative prior (Cauchy prior width $r = 0.707$), BF_{011} is 7.04 for H1 and 4.96 for H3.1/3.2

in the study by Read et al. (2018), participants only met zombie enemies. Furthermore, even though we found no evidence that sexualization increases self-objectification in a single session, there may be cumulative, long-term effects of sexualized video game use, as suggested by a recent study (Skowronski, Busching, & Krahe, 2020).

Regarding the question whether priming mechanisms or the Proteus effect are the underlying processes behind the proposed effects, we hypothesized that avatar sexualization should cause body satisfaction to either decrease (priming mechanism) or increase (Proteus effect). We did not find evidence for either of the hypotheses because the two groups did not differ in their body satisfaction scores, despite having sufficient power for the detection of an effect. Bayesian exploratory analyses suggested moderate support for the null hypothesis. This finding differs from two previous studies - inconsistent between themselves - that found a negative (Barlett & Harris, 2008) and a positive effect (Matthews et al., 2016) of playing video games with idealized characters on body satisfaction. However, these studies used quite different designs: Barlett and Harris (2008) used a pre-post design with one game, and Matthews et al. (2016) used multiple games that were different in nature (fighting games, adventure games, sports games). Our findings, however, suggest the absence of a priming or a Proteus effect of sexualization on body satisfaction. Much of the work on the Proteus effect has used full-immersive virtual reality (VR; Ratan, Beyea, Li, & Graciano, 2019). As effects of experiences in VR often vanish in a less immersive environment (Ahn, Le, & Bailenson, 2013), future research could test our hypotheses in VR. A further tentative explanation could be that playing a video game character, although sexualized, might have shifted women's focus away from its appearance towards its agentic role, thus making the sexualization and its consequences less salient. If correct, this reasoning would have implications for objectification theory: Negative or positive outcomes of sexualization might only exist in the context of passive traditional media. In video games, active handling of the character might arouse the feeling that the character has actual power and thus diminish or even eliminate the negative effect of sexualization. Future research could compare passive or active female roles in video games and their effect on women's bodily self-concept.

We further examined the role of one core feature of modern video games: personalization. We argued that the effects of sexualized avatars on women's thoughts and feelings about their body should be stronger for women who play a personalized compared with a nonpersonalized avatar. We did not find evidence for this proposition. Still, we cannot conclude from this finding that personalization is irrelevant for video-game effects. Previous studies found that personalization led to higher levels of aggressive behavior or helping

behavior after violent or cooperative gameplay, respectively (Fischer et al., 2010; Hollingdale & Greitemeyer, 2013). It is possible that personalization might only be relevant for actual behavior, but not for individuals' thoughts about their self. People might only copy what they just did in a video game, but not transfer these actions onto cognitive aspects of their self. Self-perception theory proposes that individuals infer their attitudes from observing their behaviors (Bem, 1972). In the context of objectification theory, future studies should include a behavioral measure after the exposure to sexualized video game characters, and subsequently measure self-objectification scores.

We reasoned that in the case of the Proteus effect, personalization would increase the proposed positive effect of character sexualization on body satisfaction. Our null findings provide no support for the occurrence of the Proteus effect in the context of objectification theory. However, it is important to keep in mind the results of the manipulation check variables for the personalization manipulation: Personalization led to greater perceived similarity with the game character, but did not affect character embodiment, which is the central aspect behind the Proteus effect (Yee & Bailenson, 2007). Participants could only personalize faces, not bodies, which might explain the lack of embodiment. However, because people also experience high embodiment with objects (Schettler, Raja, & Anderson, 2019), being unable to personalize the body of the avatar is unlikely to explain the failure of our personalization manipulation in inducing embodiment. As participants in our study equally embodied the character across conditions, future research on the Proteus effect and self-objectification should induce character embodiment in another way than by manipulating personalization.

We further hypothesized that the Proteus effect should be stronger for women who enjoy sexualization more and played a personalized avatar. We did not find evidence for this hypothesis. However, limited evidence for the moderating role of enjoyment of sexualization came from the exploratory analysis. We found that women who enjoy sexualization more experienced higher body satisfaction after exposure to the sexualized compared to the nonsexualized avatar. This result tentatively suggests that sexualized video game characters might even have positive effects for some women, corroborating previous research (Matthews et al., 2016), which would have to be tested in future studies.

Limitations and Future Directions

One limitation of the present study is that participants were recruited among university students, who may have already been taught about potential negative effects of media ideals and therefore been critically engaged with media and their own bodily self-concept. It would

be interesting to include measures about the extent to which participants had thought about the link between sexualized media and body image in the past and include this as a covariate in the analyses.

A second limitation of this study is that we used a single video game to examine our hypotheses. This approach has several advantages, as we discussed in the introduction. Nevertheless, it also constitutes a limitation because the question remains whether effects might be found in other game types, such as fighting games and action adventures, where sexualization is also common (Lynch et al., 2016).

Implications and Conclusions

The proposition of objectification theory that sexualized media promote self-objectification (Fredrickson & Roberts, 1997) has been supported by a large body of correlational and experimental research using traditional media (Karsay, Knoll, & Matthews, 2018; Ward, 2016). However, research applying the framework to interactive media is still in its early stages. Our study could not replicate negative or positive effects of sexualization on women's bodily self-concept in a video-game environment, raising the possibility that the framework of objectification theory might not be applicable to games. The interactive nature of games might eliminate the effects of sexualization, or effects might only occur after repeated and prolonged exposure. Furthermore, it is possible that sexualized avatars do not increase self-objectification directly after short-term exposure, but affect mediating variables, such as the internalization of appearance ideals, after repeated exposure (Skowronski et al., 2020). More longitudinal research is needed in this area to clarify whether objectification theory is a useful concept for conceptualizing effects of sexualization in video games.

This study contributes to the literature not only with its content, but also with its methodology: With its null results, the current research would likely have been a file drawer study in the past. Instead, conducted as a registered report, it enables the research community to evaluate and interpret the strength of null effects. Therefore, this registered report may advance open science and the quality of psychological science, eventually reestablishing trust in social psychological theories and results.

References

- Ahn, S. J., Le, A. M. T., & Bailenson, J. (2013). The effect of embodied experiences on self-other merging, attitude, and helping behavior. *Media Psychology, 16*(1), 7–38. <https://doi.org/10.1080/15213269.2012.755877>
- APA Task Force on the Sexualization of Girls. (2007). *Report of the APA task force on the sexualization of girls*. DC: Washington. <http://www.apa.org/pi/women/programs/girls/report-full.pdf>
- Aubrey, J. S. (2006). Effects of sexually objectifying media on self-objectification and body surveillance in undergraduates: Results of a 2-year panel study. *Journal of Communication, 56*(2), 366–386. <https://doi.org/10.1111/j.1460-2466.2006.00024.x>
- Aubrey, J. S., Henson, J. R., Hopper, K. M., & Smith, S. E. (2009). A picture is worth twenty words (about the self): Testing the priming influence of visual sexual objectification on women's self-objectification. *Communication Research Reports, 26*(4), 271–284. <https://doi.org/10.1080/08824090903293551>
- Bailey, R., Wise, K., & Bolls, P. (2009). How avatar customizability affects children's arousal and subjective presence during junk food-sponsored online video games. *Cyberpsychology & Behavior, 12*(3), 277–283. <https://doi.org/10.1089/cpb.2008.0292>
- Barlett, C. P., & Harris, R. J. (2008). The impact of body emphasizing video games on body image concerns in men and women. *Sex Roles, 59*(7-8), 586–601. <https://doi.org/10.1007/s11199-008-9457-8>
- Beasley, B., & Collins Standley, T. (2002). Shirts vs. skins: Clothing as an indicator of gender role stereotyping in video games. *Mass Communication and Society, 5*(3), 279–293. https://doi.org/10.1207/S15327825MCS0503_3
- Bem, D. J. (1972). Self-perception theory. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (Vol. 6, pp. 2–57). Academic Press. [https://doi.org/10.1016/S0065-2601\(08\)60024-6](https://doi.org/10.1016/S0065-2601(08)60024-6)
- Bessière, K., Seay, A. F., & Kiesler, S. (2007). The ideal elf: Identity exploration in World of Warcraft. *Cyberpsychology & Behavior, 10*(4), 530–535. <https://doi.org/10.1089/cpb.2007.9994>
- Burgess, M. C. R., Stermer, S. P., & Burgess, S. R. (2007). Sex, lies, and video games: The portrayal of male and female characters on video game covers. *Sex Roles, 57*(5-6), 419–433. <https://doi.org/10.1007/s11199-007-9250-0>

- Calogero, R. M. (2004). A test of objectification theory: The effect of the male gaze on appearance concerns in college women. *Psychology of Women Quarterly*, 28(1), 16–21. <https://doi.org/10.1111/j.1471-6402.2004.00118.x>
- Calogero, R. M., Davis, W. N., & Thompson, J. K. (2005). The role of self-objectification in the experience of women with eating disorders. *Sex Roles*, 52(1-2), 43–50. <https://doi.org/10.1007/s11199-005-1192-9>
- Dill, K. E., & Thill, K. P. (2007). Video game characters and the socialization of gender roles: Young people’s perceptions mirror sexist media depictions. *Sex Roles*, 57(11-12), 851–864. <https://doi.org/10.1007/s11199-007-9278-1>
- Dolgov, I., Graves, W. J., Nearents, M. R., Schwark, J. D., & Brooks Volkman, C. (2014). Effects of cooperative gaming and avatar customization on subsequent spontaneous helping behavior. *Computers in Human Behavior*, 33, 49–55. <https://doi.org/10.1016/j.chb.2013.12.028>
- Downs, E., & Smith, S. L. (2010). Keeping abreast of hypersexuality: A video game character content analysis. *Sex Roles*, 62(11-12), 721–733. <https://doi.org/10.1007/s11199-009-9637-1>
- Ducheneaut, N., Wen, M.-H., Yee, N., & Wadley, G. (2009). Body and mind: A study of avatar personalization in three virtual worlds. In D. R. Olsen, R. B. Arthur, K. Hinckley, M. R. Morris, S. Hudson, & S. Greenberg (Eds.), *Proceedings of the 27th international conference on Human factors in computing systems - CHI 09* (pp. 1151–1160). New York: ACM Press.
- Entertainment Software Association. (2016). *Essential facts about the computer and video game industry: Sales, demographic and usage data*. (Washington, DC) https://cdn.arstechnica.net/wp-content/uploads/2017/04/esa_ef_2016.pdf.
- Fischer, P., Kastenmüller, A., & Greitemeyer, T. (2010). Media violence and the self: The impact of personalized gaming characters in aggressive video games on aggressive behavior. *Journal of Experimental Social Psychology*, 46(1), 192–195. <https://doi.org/10.1016/j.jesp.2009.06.010>
- Fox, J., Bailenson, J. N., & Tricase, L. (2013). The embodiment of sexualized virtual selves: The Proteus effect and experiences of self-objectification via avatars. *Computers in Human Behavior*, 29(3), 930–938. <https://doi.org/10.1016/j.chb.2012.12.027>
- Fox, J., Ralston, R. A., Cooper, C. K., & Jones, K. A. (2015). Sexualized avatars lead to women’s self-objectification and acceptance of rape myths. *Psychology of Women Quarterly*, 39(3), 349–362. <https://doi.org/10.1177/0361684314553578>

- Fredrickson, B. L., & Roberts, T.-A. (1997). Objectification theory: Toward understanding women's lived experiences and mental health risks. *Psychology of Women Quarterly*, 21(2), 173–206. <https://doi.org/10.1111/j.1471-6402.1997.tb00108.x>
- Fredrickson, B. L., Roberts, T.-A., Noll, S. M., Quinn, D. M., & Twenge, J. M. (1998). That swimsuit becomes you: Sex differences in self-objectification, restrained eating, and math performance. *Journal of Personality and Social Psychology*, 75(1), 269–284. <https://doi.org/10.1037/0022-3514.75.1.269>
- Garner, D. M. (2004). *EDI-3, Eating Disorder Inventory-3: Professional manual*. Lutz, FL: Psychological Assessment Resources, Inc.
- Grabe, S., Ward, L. M., & Hyde, J. S. (2008). The role of the media in body image concerns among women: A meta-analysis of experimental and correlational studies. *Psychological Bulletin*, 134(3), 460–476. <https://doi.org/10.1037/0033-2909.134.3.460>
- Halliwell, E., Malson, H., & Tischner, I. (2011). Are contemporary media images which seem to display women as sexually empowered actually harmful to women? *Psychology of Women Quarterly*, 35(1), 38–45. <https://doi.org/10.1177/0361684310385217>
- Hartmann, T., & Klimmt, C. (2006). Gender and computer Games: Exploring females' dislikes. *Journal of Computer-Mediated Communication*, 11(4), 910–931. <https://doi.org/10.1111/j.1083-6101.2006.00301.x>
- Hebl, M. R., King, E. B., & Lin, J. (2004). The swimsuit becomes us all: Ethnicity, gender, and vulnerability to self-objectification. *Personality & Social Psychology Bulletin*, 30(10), 1322–1331. <https://doi.org/10.1177/0146167204264052>
- Hollingdale, J., & Greitemeyer, T. (2013). The changing face of aggression: The effect of personalized avatars in a violent video game on levels of aggressive behavior. *Journal of Applied Social Psychology*, 43(9), 1862–1868. <https://doi.org/10.1111/jasp.12148>
- Interactive Software Federation of Europe. (2012). *Videogames in Europe: Consumer study. European summary report*. Brussels: Ipsos MediaCT. <https://www.yumpu.com/en/document/view/50537698/report-interactive-software-federation-of-europe>
- Karsay, K., Knoll, J., & Matthes, J. (2018). Sexualizing media use and self-objectification: A meta-analysis. *Psychology of Women Quarterly*, 42(1), 9–28. <https://doi.org/10.1177/0361684317743019>
- Karsay, K., & Matthes, J. (2020). Sexually objectifying pop music videos, young women's self-objectification, and selective exposure: A moderated mediation model. *Communication Research*, 47(3), 428–450. <https://doi.org/10.1177/0093650216661434>

- Konijn, E. A., Bijvank, M. N., & Bushman, B. J. (2007). I wish I were a warrior: The role of wishful identification in the effects of violent video games on aggression in adolescent boys. *Developmental Psychology*, *43*(4), 1038–1044. <https://doi.org/10.1037/0012-1649.43.4.1038>
- Linder, J. R., & Daniels, E. A. (2018). Sexy vs. sporty: The effects of viewing media images of athletes on self-objectification in college students. *Sex Roles*, *78*(1-2), 27–39. <https://doi.org/10.1007/s11199-017-0774-7>
- Liss, M., Erchull, M. J., & Ramsey, L. R. (2011). Empowering or oppressing? Development and exploration of the Enjoyment of Sexualization Scale. *Personality & Social Psychology Bulletin*, *37*(1), 55–68. <https://doi.org/10.1177/0146167210386119>
- Lynch, T., Tompkins, J. E., van Driel, I. I., & Fritz, N. (2016). Sexy, strong, and secondary: A content analysis of female characters in video games across 31 years. *Journal of Communication*, *66*(4), 564–584. <https://doi.org/10.1111/jcom.12237>
- Matthews, N. L., Lynch, T., & Martins, N. (2016). Real ideal: Investigating how ideal and hyper-ideal video game bodies affect men and women. *Computers in Human Behavior*, *59*, 155–164. <https://doi.org/10.1016/j.chb.2016.01.026>
- McCain, J., Ahn, S. J., & Campbell, W. K. (2018). Is desirability of the trait a boundary condition of the Proteus effect? A pilot study. *Communication Research Reports*, *35*(5), 445–455. <https://doi.org/10.1080/08824096.2018.1531212>
- Morry, M. M., & Staska, S. L. (2001). Magazine exposure: Internalization, self-objectification, eating attitudes, and body satisfaction in male and female university students. *Canadian Journal of Behavioural Science / Revue Canadienne Des Sciences Du Comportement*, *33*(4), 269–279. <https://doi.org/10.1037/h0087148>
- Mulgrew, K. E., & Hennes, S. M. (2015). The effect of functionality- and aesthetic-focused images on Australian women's body satisfaction. *Sex Roles*, *72*(3-4), 127–139. <https://doi.org/10.1007/s11199-014-0440-2>
- Ng, R., & Lindgren, R. (2013, July). Examining the effects of avatar customization and narrative on engagement and learning in video games. In *Proceedings of CGAMES'2013 USA, Louisville, KY* (pp. 87-90). <https://doi.org/10.1109/CGames.2013.6632611>.
- Noll, S. M., & Fredrickson, B. L. (1998). A mediational model linking self-objectification, body shame, and disordered eating. *Psychology of Women Quarterly*, *22*(4), 623–636. <https://doi.org/10.1111/j.1471-6402.1998.tb00181.x>

- Posavac, H. D., Posavac, S. S., & Posavac, E. J. (1998). Exposure to media images of female attractiveness and concern with body weight among young women. *Sex Roles, 38*(3/4), 187–201. <https://doi.org/10.1023/A:1018729015490>
- Prichard, I., & Tiggemann, M. (2012). The effect of simultaneous exercise and exposure to thin-ideal music videos on women's state self-objectification, mood and body satisfaction. *Sex Roles, 67*(3-4), 201–210. <https://doi.org/10.1007/s11199-012-0167-x>
- Ratan, R., Beyea, D., Li, B. J., & Graciano, L. (2019). Avatar characteristics induce users' behavioral conformity with small-to-medium effect sizes: A meta-analysis of the proteus effect. *Media Psychology, 11*(4), 1–25. <https://doi.org/10.1080/15213269.2019.1623698>
- Raven, J. C., & Court, J. H. (1962). *Advanced progressive matrices*. HK Lewis London.
- Read, G. L., Lynch, T., & Matthews, N. L. (2018). Increased cognitive load during video game play reduces rape myth acceptance and hostile sexism after exposure to sexualized female avatars. *Sex Roles, 5*(4), 279. <https://doi.org/10.1007/s11199-018-0905-9>
- Schettler, A., Raja, V., & Anderson, M. L. (2019). The embodiment of objects: Review, analysis, and future directions. *Frontiers in Neuroscience, 13*, 1332. <https://doi.org/10.3389/fnins.2019.01332>
- Schmierbach, M., Limperos, A. M., & Woolley, J. K. (2012). Feeling the need for (personalized) speed: How natural controls and customization contribute to enjoyment of a racing game through enhanced immersion. *Cyberpsychology, Behavior and Social Networking, 15*(7), 364–369. <https://doi.org/10.1089/cyber.2012.0025>
- Skowronski, M., Busching, R., & Krahe, B. (2020). Predicting adolescents' self-objectification from sexualized video game and Instagram use: A longitudinal study. *Sex Roles*. Advance online publication. <https://doi.org/10.1007/s11199-020-01187-1>
- Slater, A., & Tiggemann, M. (2010). Body image and disordered eating in adolescent girls and boys: A test of objectification theory. *Sex Roles, 63*(1), 42–49. <https://doi.org/10.1007/s11199-010-9794-2>
- Tiggemann, M., & Lynch, J. E. (2001). Body image across the life span in adult women: The role of self-objectification. *Developmental Psychology, 37*(2), 243–253. <https://doi.org/10.1037/0012-1649.37.2.243>
- Tiggemann, M., & Williams, E. (2011). The role of self-objectification in disordered eating, depressed mood, and sexual functioning among women. *Psychology of Women Quarterly, 36*(1), 66–75. <https://doi.org/10.1177/0361684311420250>

- Turkay, S., & Kinzer, C. K. (2014). The effects of avatar-based customization on player identification. *International Journal of Gaming and Computer-Mediated Simulations (IJGCMS)*, 6(1), 1–25.
- van de Schoot, R., & Depaoli, S. (2014). Bayesian analyses: Where to start and what to report. *The European Health Psychologist*, 16(2), 75–84. <http://www.ehps.net/ehp/index.php/contents/article/view/ehp.v16.i2.p75>.
- van Looy, J., Courtois, C., Vocht, M. de, & Marez, L. de (2012). Player identification in online games: Validation of a scale for measuring identification in MMOGs. *Media Psychology*, 15(2), 197–221. <https://doi.org/10.1080/15213269.2012.674917>
- Vandenbosch, L., Driesmans, K., Trekels, J., & Eggermont, S. (2017). Sexualized video game avatars and self-objectification in adolescents: The role of gender congruency and activation frequency. *Media Psychology*, 20(2), 221–239. <https://doi.org/10.1080/15213269.2016.1142380>
- Vandenbosch, L., & Eggermont, S. (2012). Understanding sexual objectification: A comprehensive approach toward media exposure and girls' internalization of beauty ideals, self-objectification, and body surveillance. *Journal of Communication*, 62(5), 869–887. <https://doi.org/10.1111/j.1460-2466.2012.01667.x>
- Vandenbosch, L., & Eggermont, S. (2015). The role of mass media in adolescents' sexual behaviors: Exploring the explanatory value of the three-step self-objectification process. *Archives of Sexual Behavior*, 44(3), 729–742. <https://doi.org/10.1007/s10508-014-0292-4>
- Wagenmakers, E.-J., Love, J., Marsman, M., Jamil, T., Ly, A., Verhagen, J., ... Morey, R. D. (2018). Bayesian inference for psychology. Part II: Example applications with JASP. *Psychonomic Bulletin & Review*, 25(1), 58–76. <https://doi.org/10.3758/s13423-017-1323-7>
- Ward, L. M. (2016). Media and sexualization: State of empirical research, 1995-2015. *Journal of Sex Research*, 53(4-5), 560–577. <https://doi.org/10.1080/00224499.2016.1142496>
- Williams, D., Martins, N., Consalvo, M., & Ivory, J. D. (2009). The virtual census: Representations of gender, race and age in video games. *New Media & Society*, 11(5), 815–834. <https://doi.org/10.1177/1461444809105354>
- Yee, N., & Bailenson, J. N. (2007). The Proteus Effect: The effect of transformed self-representation on Behavior. *Human Communication Research*, 33(3), 271–290. <https://doi.org/10.1111/j.1468-2958.2007.00299.x>

- Yee, N., & Bailenson, J. N. (2009). The difference between being and seeing: The relative contribution of self-perception and priming to behavioral changes via digital self-representation. *Media Psychology*, *12*(2), 195–209. <https://doi.org/10.1080/15213260902849943>
- Yee, N., Bailenson, J. N., & Ducheneaut, N. (2009). The Proteus Effect: Implications of transformed digital self-representation on online and offline behavior. *Communication Research*, *36*(2), 285–312. <https://doi.org/10.1177/0093650208330254>

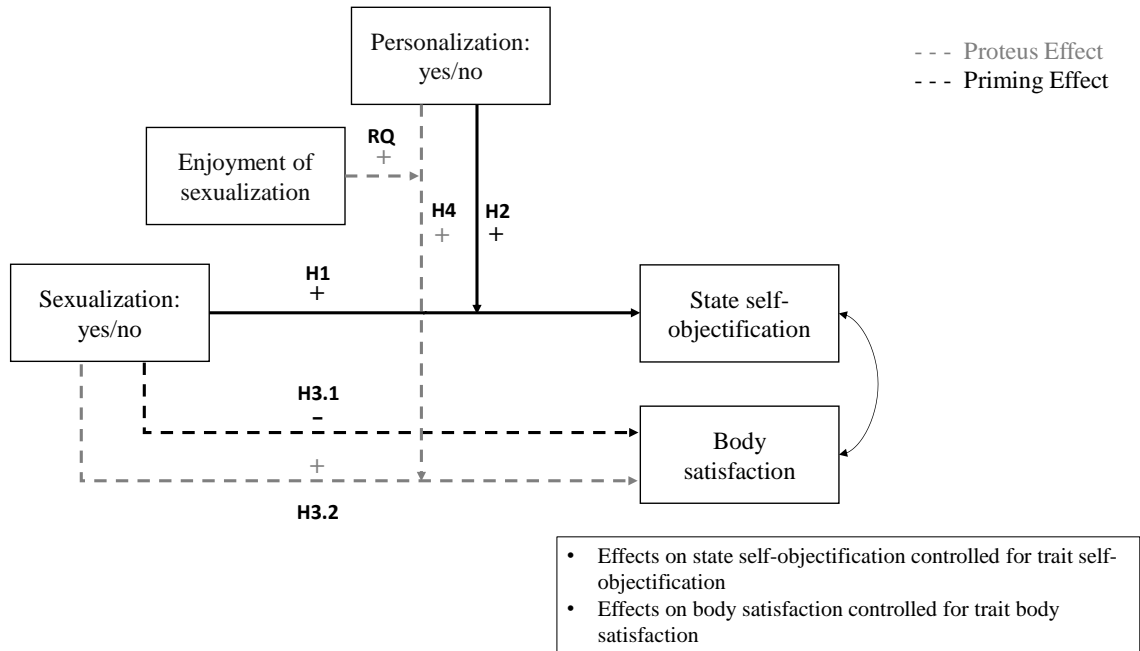
Table 1*Zero-Order Correlations among All Variables, Means and SDs*

	1	2	3	4	5
1. State self-objectification					
2. State body satisfaction	.11				
3. Trait self-objectification	-.08	-.18**			
4. Trait body satisfaction	.08	.90***	-.17**		
5. Enjoyment of sexualization	.06	.08	.20***	.14*	
<i>M (SD): Overall</i>	1.89 (1.29)	3.48 (0.90)	-12.61 (9.82)	3.31 (0.80)	2.80 (0.66)
<i>M (SD): Sexualized/Personalized</i>	1.66 (1.25)	3.55 (0.83)	-14.14 (8.64)	3.37 (0.75)	2.78 (0.62)
<i>M (SD): Sexualized/Nonpersonalized</i>	2.06 (1.22)	3.51 (0.97)	-12.18 (10.21)	3.29 (0.85)	2.77 (0.68)
<i>M (SD): Nonsexualized/Personalized</i>	1.91 (1.35)	3.49 (0.92)	-11.44 (10.04)	3.31 (0.83)	2.81 (0.66)
<i>M (SD): Nonsexualized/Nonpersonalized</i>	1.92 (1.32)	3.36 (0.88)	-12.69 (10.30)	3.28 (0.78)	2.82 (0.69)

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

Figure 1

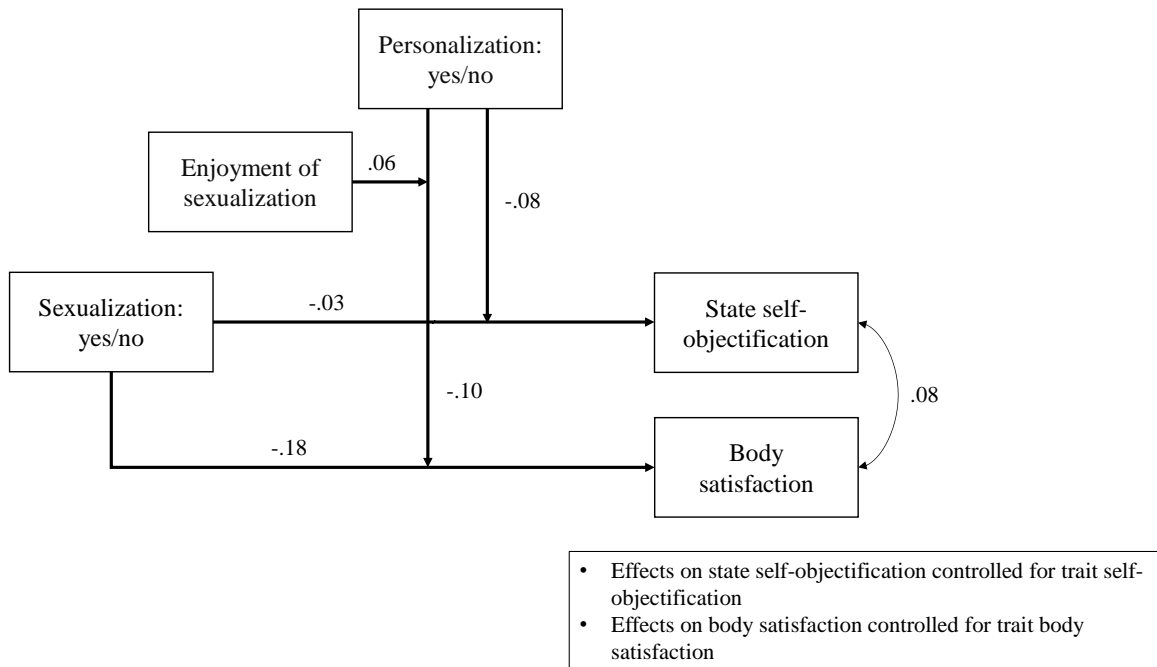
Proposed Model of the Relation between Avatar Sexualization, Personalization, Enjoyment of Sexualization and Self-Objectification and Body Satisfaction



Note: The curved arrow represents the residual correlations remaining between the two dependent variables

Figure 2

Results for the Model of the Relation between Avatar Sexualization, Personalization, Enjoyment of Sexualization and Self-Objectification and Body Satisfaction. All Paths Non-Significant.



Note: The curved arrow represents the residual correlations remaining between the two dependent variables

5 Study 2: Women's exposure to sexualized television, self-objectification, and consideration of cosmetic surgery: The role of age³

Abstract

Extensive research has documented links between sexualized media use and body image concerns. Previous findings are based largely on female adolescent or young adults, although objectification theory predicts changes of body image concerns with age. Therefore, the current study investigated the link of sexualized television exposure (STE) with self-objectification and consideration of cosmetic surgery within the framework of objectification theory in a sample of 519 female participants between the age of 15 and 72 (mean: 39.43 years). Participants completed measures of STE, appearance-ideal internalization, valuing appearance over competence, body surveillance, and consideration of cosmetic surgery. Structural equation modeling revealed that STE was indirectly linked with consideration of cosmetic surgery via valuing appearance over competence and body surveillance. Age was negatively related to internalization, valuing appearance over competence, and body surveillance, but did not moderate the links between STE and body image. Older women scored lower on the body-related variables, but the associations between STE and self-objectification were the same across the age spectrum. STE predicted consideration of cosmetic surgery only for women over 31 years of age. Implications concerning the role of age in linking sexualized media to self-objectification are discussed.

Public significance statement: Television is full of content presenting women in a sexualized way, with a focus on their sexual appearance and appeal to others. We found that across an age spectrum from 15 to 72 years, the more women watched sexualized television, the more concerned they were about their body; a link between watching sexualized television and considering cosmetic surgery was found only for women above the age of 31. Adding to the evidence documenting negative consequences of media use on young women's body image, this study is a first indicator that these might also apply to women across a broader age spectrum.

Keywords: television; sexualization; age; body image; self-objectification

³ Skowronski, M., Busching, R., & Krahe, B. (in press). Women's exposure to sexualized television, self-objectification, and consideration of cosmetic surgery: The role of age. *Psychology of Popular Media*.

Women's Exposure to Sexualized Television, Self-Objectification, and Consideration of Cosmetic Surgery: The Role of Age

German adults spend over 2.5 hours a day watching television. While streaming portals are becoming more popular especially among younger people, a majority of viewing time is still spent on broadcast television by people of all ages (Kupferschmitt & Müller, 2020). Much of television is characterized by an emphasis on women's sexual appearance and sexual appeal to others, a phenomenon called sexualization (APA Task Force on the Sexualization of Girls, 2007). For example, 45.5 % of young female characters in prime-time television programs in the United States (Smith et al., 2012) are portrayed in a sexualized way, and many of these programs are also shown on German television. In past decades, research has documented links between exposure to sexualized television and women's body image concerns (Karsay et al., 2018; Ward, 2016). However, this work has focused on adolescence and young adulthood. Despite evidence that both women's media use and their body image concerns may change with age, research is lacking that investigates these relationships in women beyond early adulthood (Ward, 2016). The current study aims to address this gap by examining whether age plays a moderating role in the proposed links between sexualized television use and body image concerns, including consideration of cosmetic surgery as a further outcome variable.

Objectification theory (Fredrickson & Roberts, 1997) provides a well-supported theoretical framework for describing the relations between sexualized media use and body image concerns. According to the theory, women in Western societies learn from an early age that their body is "objectified", that is evaluated by others. Women gradually internalize this observer perspective on themselves, valuing their body for its correspondence with the society's current appearance ideal. This process is called self-objectification, manifested at the cognitive level by women's tendency to value appearance over competence, and at the behavioral level through persistent body surveillance, defined as habitually monitoring one's body (Calogero, 2011; Moradi, 2011). Both facets have been connected to various negative outcomes, such as body shame, eating disorders, and depression (Slater & Tiggemann, 2010; Tiggemann & Williams, 2011). Fredrickson and Roberts (1997) proposed that sexualized media are one source of objectification and contribute to the development of self-objectification. Consistent with this reasoning, STE has been linked to self-objectification in adolescent and young adult women (Karsay et al., 2018). Longitudinal studies have further identified the internalization of societal ideals of attractiveness (henceforth referred to as internalization) as a mediating variable in this association (Ward, 2016). According to the three-step process model of self-

objectification (Vandenbosch & Eggermont, 2015), sexualized media are proposed to predict valuing appearance over competence (henceforth referred to as valuing appearance) both directly and indirectly via internalization. Internalization and valuing appearance then predict body surveillance.

Previous research on sexualized media and self-objectification has an important limitation: All the relations have exclusively been studied in young women, mainly college students (Ward, 2016). This is surprising, as objectification theory explicitly asserts that self-objectification may change over time, decreasing with age (Fredrickson & Roberts, 1997; Tiggemann & Lynch, 2001). There are several possibilities how age might be relevant. As women become older, their bodies tend to be further away from the narrow, youth-oriented body ideal presented by the media (Slevec & Tiggemann, 2011). As a result, the relation between sexualized media and self-objectification might increase, suggesting age as a positive moderator. However, the relation could also be weaker because appearance ideals might be less important for older women's identity (Clarke & Korotchenko, 2011). Also, as sexualized women on television are usually in their twenties or younger (Sink & Mastro, 2017), women beyond this age might not identify with them anymore. The latter two possibilities would suggest age to be a negative moderator. As a third possibility, higher age may be linked with lower levels of self-objectification, as documented by several studies (Clarke & Korotchenko, 2011), but the associations between media use and self-objectification may remain the same. In this case, age would reduce the means on the variables of the self-objectification process (internalization, valuing appearance, body surveillance), but not moderate their associations with STE.

The past decades have seen an increase in cosmetic surgery in Western countries like Germany and the U.S., especially for procedures that lift aging body parts (American Society of Plastic Surgeons, 2018; Deutsche Gesellschaft für ästhetisch-plastische Chirurgie, 2020). Germany ranks among the top ten in the rate of plastic surgery worldwide, with rates similar to the U.S. (Heidekrueger et al., 2017). By far the biggest consumer group are women between 40 and 55 years, but numbers are also high and rising for older women. The number of women considering this option is likely to be even higher, indicating that the possibility of undergoing plastic surgery is an option for many women. Research shows that women are more likely to consider cosmetic surgery the higher they are in body surveillance (Calogero et al., 2010; Jackson & Chen, 2015) and the more they watch appearance-focused television (Sharp et al., 2014; Slevec & Tiggemann, 2010). In the light of these studies, consideration of cosmetic surgery is a meaningful, yet unstudied factor when investigating the relations between STE,

self-objectification, and age. STE and self-objectification, as manifested by body surveillance, should then predict consideration of cosmetic surgery. Again, the role of age in these relations is unclear. Age could play a positive or negative moderating role. Previous research indicates positive relations between age and consideration of cosmetic surgery (Henderson-King & Henderson-King, 2005). This makes sense as cosmetic surgery is primarily used as a way to correct age-related bodily changes (American Society of Plastic Surgeons, 2018). Similar to our reasoning concerning self-objectification and age, another possibility would be that age may increase consideration of cosmetic surgery, but not moderate its association with STE.

To address the identified research gaps, the current study measured STE in women across a broad age spectrum and tested associations with body image concerns, including the consideration of cosmetic surgery, in an extended model derived from the three-step process of self-objectification (Vandenbosch & Eggermont, 2015). Based on this reasoning, we assumed that STE would positively predict valuing appearance (H1) and internalization (H2). We further expected internalization to positively predict valuing appearance (H3) and body surveillance (H4), and we expected a positive direct path from valuing appearance to body surveillance (H5). In line with previous studies, we assumed that cosmetic surgery consideration would be positively predicted by body surveillance (H6) and STE (H7). Finally, we assumed indirect links between STE and consideration of cosmetic surgery via internalization, valuing appearance, and body surveillance (H8).

As the role of age in these dynamics is yet unclear, we addressed the following research questions instead of presenting directed hypotheses: Is age related to the variables in the model (RQ1)? Are the paths between STE and body image concerns (internalization, valuing appearance) moderated by age (RQ2)? Is the path between STE and consideration of cosmetic surgery moderated by age (RQ3)? The proposed hypotheses and research questions are indicated in Figure 1.

Method

Participants

We recruited participants by spreading the link to the online survey on social networking sites (Facebook), internet forums and via flyers in public places. In addition, we distributed paper-pencil surveys to participants in public places (e.g., shopping malls). A total of 558 participants took part in the study. We excluded 39 participants because they had missing data on exogenous variables, resulting in a final sample of $N = 519$ women, with a mean age of $M = 39.43$ years ($SD = 13.55$, Range: 15-72 years). Participants had a mean BMI of $M = 23.92$ (SD

= 4.32, Range: 16.03-52.74). About half of the participants ($n = 277$; 53.4%) participated via paper-pencil surveys, $n = 242$ (46.6%) completed the questionnaire online. The majority of participants were German nationals (97.1%), indicated that German was their mother tongue (92.7%). A third of the participants had a university degree (33.3%), and a quarter had a high school degree (24.1%). More than two thirds were working part- or full-time (69.8%).

Measures

Sexualized Television Exposure (STE)

To assess STE, we created an initial pool of 58 currently popular broadcast television shows. We decided against including streaming portals as they are mostly watched by younger people (Kupferschmitt & Müller, 2020) and thus do not reflect a broad viewership. The shows were chosen based on a television user analysis by Erk and Kloppenburg (2016) that provided a list of the most watched television shows in a representative federal state of Germany. Shows were excluded if sexualization was not expected to occur (e.g., “Who wants to be a millionaire?”). Additionally, German online TV guides (www.tvspielfilm.de and www.tvmovie.de) were inspected, and prime time television shows that were likely to contain elements of sexualization were added to the list. Three female raters who reported watching more than 2 hours of TV per day independently estimated the level of sexualization of all 58 shows. All raters were given a definition of sexualization based on the APA Task Force on the Sexualization of Girls (2007) along with examples of sexualization on TV. For each show, the raters indicated the frequency of sexualization on a scale from 1 (*never*) to 5 (*very often*), the intensity of sexualization on a scale from 1 (*not at all*) to 5 (*very much*), and how familiar they were with the respective show on a scale from 1 (*not at all*) to 5 (*very much*). We applied a procedure based on the method by Zurbriggen et al. (2011) to calculate the level of sexualization for each show. First, we multiplied frequency and intensity ratings for each show. To check inter-rater reliability, we calculated the two-way mixed-effects intraclass correlation coefficient (ICC) for the product of sexualization frequency and intensity between the three raters. The ICC was good with a value of .92, 95% CI (.87, .95), indicating high consistency between the raters. As a measure of interrater agreement, we further calculated Krippendorff’s alpha across the three raters. With a value of 0.68, it was in the acceptable range (Krippendorff, 2018).

Second, we multiplied each rater’s combined index of frequency and intensity with her familiarity rating for the respective show. In the third step, we divided each rater’s product of frequency, intensity and familiarity by the sum score of familiarity per show for the three raters. In a fourth step, we calculated the sum of these weighted sexualization scores of all raters to yield a final sexualization score per show. We included the 20 TV shows with the highest level

of sexualization in a final list (e.g., “Germany’s next Topmodel”, “The Bachelor”). The initial pool of shows as well as the final list are provided in the Supplementary Material⁴.

This list of 20 TV shows was given to participants, who reported on a scale from 0 (*never*) to 4 (*every time*) how often they viewed each show. For each participant, we created the product of the exposure frequency and the sexualization score per show as established by the raters. The mean of all 20 shows served as a measure of STE, with higher scores indicating higher STE. The theoretical range of the resulting scores was 0–100. The multiplicative index of content ratings and user frequency reports is common in this field (Aubrey, 2006; Zurbriggen et al., 2011) as well as in other areas of research on media effects, such as effects of violent media exposure (Busching et al., 2015).

Appearance-Ideal Internalization

We used the “Thin/Low Body Fat” subscale of the “Sociocultural Attitudes towards Appearance Questionnaire-4R” (SATAQ-4R; Schaefer et al., 2017). The scale consists of four items (e.g., “I want my body to be very thin”). Participants rated the extent to which they strive toward the appearance ideal on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*), with higher scores indicating higher internalization. The measure showed good reliability in past research, $\alpha = 0.82$ (Schaefer et al., 2017). In the present study, internal consistency was also high with $\alpha = .84$.

Valuing Appearance over Competence

We assessed valuing appearance by the “Self-Objectification Questionnaire” (Noll & Fredrickson, 1998). Participants were asked to rank ten body attributes from 9 (*most important*) to 0 (*least important*) for their individual bodily self-concept. Five of the attributes are appearance-based (e.g., sex appeal) and five are competency-based (e.g. stamina). The difference between the sum of the ranks of the appearance-based attributes and the competency-based attributes determined participants’ score of valuing appearance, with higher scores indicating higher levels of valuing appearance. The measure has been shown to have good construct validity (Noll & Fredrickson, 1998).

Body Surveillance

We used the “Surveillance” subscale of the “Objectified Body Consciousness Scale” (Moradi & Varnes, 2017). The scale consists of seven items (e.g., “During the day, I think about how I look many times”), rated on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*), with

⁴ The supplementary material of this study can be found online via the respective article.

higher scores indicating higher body surveillance. The measure showed good reliability in past research, $\alpha = 0.83$ (Moradi & Varnes, 2017). In the present study, internal consistency was also high with $\alpha = .79$.

Consideration of Cosmetic Surgery

The “Consider” Subscale of the “Acceptance of Cosmetic Surgery Scale” (Henderson-King & Henderson-King, 2005) was used to measure the likelihood that the respondent would consider having cosmetic surgery. The scale consists of five items (e.g., “In the future, I could end up having some kind of cosmetic surgery”), rated on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*), with higher scores indicating higher consideration of cosmetic surgery. The measure showed good reliability in past research, $\alpha = 0.83$ (Henderson-King & Henderson-King, 2005). In the present study, internal consistency was also high with $\alpha = .94$.

Control Variables

To control for participants’ overall television use, participants indicated on a scale from 1 (*not at all*) to 5 (*daily*) how often they watch television per week. They further reported how much time they spend watching television on a typical day on a scale from 1 (*no time at all*) to 5 (*more than 2 hours*). The product of frequency and intensity yielded a score of overall television use, with a range of 1 to 25. Furthermore, participants indicated their weight and height. We calculated the body mass index (BMI) by dividing weight by squared height. Although self-reports of height and weight may be slightly biased, self-reported BMI has been shown to be a reliable measure across different socio-demographic groups (Hodge et al., 2020).

Procedure

We conducted the study online using the Limesurvey software and via paper-pencil questionnaires. No compensation was provided. After providing informed consent (online: by clicking a button, paper-pencil: by signing a document), participants completed the questionnaire and were debriefed. The study was approved by the Ethics Committee of the authors’ university.

Plan of Analyses

We tested the hypothesized model with Mplus 8.4, using structural equation modelling. Missing data on endogenous variables were handled using the FIML estimator. For internalization and cosmetic surgery consideration, we used the respective items as indicators for the latent variables. Three correlational item parcels were used as indicators for the latent body surveillance variable (Little et al., 2013). Due to its rank-order format, we included valuing appearance as a manifest variable in the model. STE was also included as a manifest

variable. For the moderator analyses, age and STE were centered, and an interaction term was created by multiplying these variables. We further standardized the variable STE. Age was included as a predictor for all endogenous variables. We tested the moderating role of age by including the interaction terms of age and the respective predictor variables in the analysis. All paths controlled for overall television use and BMI. To test the significance of the direct and indirect paths, we calculated 95% and 99% confidence intervals through 10,000 bias-corrected bootstrap replications using the maximum likelihood (ML) estimator. The bootstrapping approach has been shown to be superior to all other procedures for testing indirect paths and does not rely on assumptions of normality (Hayes & Scharkow, 2013). The Mplus code and output are provided in the Supplementary Material. Data and materials are available upon request.

Results

Descriptive Statistics and Correlations

Table 1 presents the descriptive statistics, scale range, and zero-order correlations for all variables. STE was significantly correlated with all variables related to body image concerns (r s ranging from .10 to .34), and with consideration of cosmetic surgery ($r = .24$). Negative correlations were found between age and STE, internalization, valuing appearance, body surveillance and consideration of cosmetic surgery (r s ranging from -.15 to -.39). Age correlated positively with overall television use ($r = .34$) and BMI ($r = .25$). Overall television use was negatively correlated with internalization ($r = -.14$) and body surveillance ($r = -.10$), but unrelated to valuing appearance and consideration of cosmetic surgery. All variables were non-normally distributed and positively skewed, apart from overall television use, which was negatively skewed. We tested differences on all variables between online and paper-pencil participants with SPSS 26, using t-tests instead of multivariate analysis of variance, which uses listwise deletion. An alpha level of $p < .006$ (.05/8) was used to correct for multiple comparison. Online participants were significantly younger and had higher ratings of internalization, valuing appearance, body surveillance, and consideration of cosmetic surgery. Furthermore, online participants reported less overall television use and had a lower BMI. There were no differences for STE between groups (see Supplementary Material for the test statistics).

Hypothesis Testing Analyses

Because data collection method (online vs. paper-pencil) might affect the results, we examined in a first step if data collection method was a moderator of the proposed associations. We ran an analysis of our hypothesized model in Figure 1 in which we took data collection method into account. Mplus could not compute multiple group analyses because of the

correlation between age and data collection method as a binary factor. Therefore, we used latent class structural equation modelling with data collection method as a knownclass variable and estimated two models: One in which the paths were constrained to be equal for both online and paper-pencil participants, and another in which the paths were allowed to vary between the groups. We compared both models, using the Bayes Information Criteria (BIC) as the comparison criterion. The smaller BIC value represents the better fitting model (Raftery, 1995). The constrained model had a smaller BIC value than the unconstrained model ($BIC_{\text{Constrained}} = 20727.87$; $BIC_{\text{Unconstrained}} = 20810.17$; $\Delta BIC = -82.3$), indicating better fit for the constrained model. This means that data collection method did not moderate the hypothesized relations. Therefore, we employed single-group modelling in the following analyses.

Figure 2 depicts the standardized direct path coefficients of the proposed model, and Table 2 shows the 95% and 99% confidence intervals and coefficients for all paths. The model fit was good, $\chi^2 (df = 107, N = 519) = 281.465, p < .001$, CFI = .960, RMSEA = .056, 90% CI [.048, .064], SRMR = .043 (Schermelleh-Engel et al., 2003). Supporting H1, we found that STE positively predicted valuing appearance. We did not find STE to predict internalization, lending no support to H2. Consistent with H3 and H4, the proposed positive paths from internalization to valuing appearance and body surveillance were significant. We further found valuing appearance to positively predict body surveillance, consistent with H5. In line with H6 and H7, body surveillance and STE positively predicted consideration of cosmetic surgery. The indirect link between STE and consideration of cosmetic surgery via internalization, valuing appearance, and body surveillance was not significant, not supporting H8. The indirect link without internalization was significant (not hypothesized, see Table 2).

To answer RQ1, we tested whether age was related to the variables in the model. Age was negatively associated with all variables of the self-objectification process (internalization, valuing appearance, body surveillance), but was unrelated to consideration of cosmetic surgery. In RQ2, we examined age as a moderator of the paths between STE and body image concerns. None of the interaction terms were significant, indicating that age did not moderate the associations. However, regarding RQ3, age emerged as a positive moderator of the link between STE and consideration of cosmetic surgery. As shown in Figure 3, the strength of the relation between STE and consideration of cosmetic surgery increased with age. The Johnson-Neyman technique (Bauer & Curran, 2005) provides critical values at which the simple slope of the predictor differs from zero and revealed that STE positively predicted consideration of cosmetic surgery only for women above 30.87 years. For younger women, STE was unrelated to

consideration of cosmetic surgery. Supplementary analyses revealed that age did not moderate other paths than those specified in the model (see Supplementary Material).

Discussion

Growing evidence has shown that sexualized media contents trigger self-objectification (Karsay et al., 2018), but previous research exclusively studied adolescents or young adults, although objectification theory predicts changes in self-objectification over the life course (Fredrickson & Roberts, 1997). To our knowledge, this study is the first to investigate the role of age in the three-step process of self-objectification (Vandenbosch & Eggermont, 2015) in a sample where age was distributed between 15 and 72 years. Moreover, our participants were recruited from the community rather than student populations, as indicated by the fact that almost 70% of women were working full- or part-time. Vandenbosch and Eggermont's (2015) model provided a reasonable fit for our data. It is noteworthy that we did not find the path from STE to internalization. As longitudinal research also failed to find this path (Skowronski et al., 2021), it might be beneficial to re-evaluate the model and specifically the role of internalization in future research: For example, people's tendency to compare their appearance to others (appearance comparisons) might be a mediator between sexualized media and internalization, and self-objectification (Skowronski et al., 2021). In addition, we found that with increasing age, women expressed lower levels of internalization, valuing appearance, and body surveillance, in line with previous research (Clarke & Korotchenko, 2011). Age did not have a moderating effect on the links between media use and internalization or valuing appearance. This has implications for objectification theory: First, it suggests that the model also applies to women beyond young adulthood, indicating that these women may also experience the negative media effects that are widely confirmed for younger women (Ward, 2016). Second, our findings show that although associations between media use and self-objectification were consistent across age groups, women's attitudes about their bodies become more positive with age. One explanation is that women might appreciate their bodies more for their functionality than for their appearance as they grow older (Halliwell, 2015). Another explanation could be that beauty ideals in the media with regard to sexualized appearance are primarily represented by young women, who may be less relevant as standards of comparison for older women.

A further aim of this study was to extend the self-objectification model by including consideration of cosmetic surgery as an additional outcome variable. We found that body surveillance was linked with a higher probability of considering cosmetic surgery at some point in the future. Objectification theory can thus offer an explanatory mechanism behind the consideration of cosmetic surgery. Furthermore, we found STE to be directly linked to higher

consideration of cosmetic surgery, but this seems to play out only for women over 30: STE was significantly linked with the consideration of cosmetic surgery from this age onward. Cosmetic surgery is primarily used as a tool to prevent the body from showing signs of aging (American Society of Plastic Surgeons, 2018), thus being more relevant for women over 30. Furthermore, women in their twenties might not have the financial means to consider cosmetic surgery as a feasible option. Taken together, while age seems to reduce women's concerns about body image regarding self-objectification, it may nevertheless strengthen their motivation to undergo cosmetic surgery if they watch a lot of sexualized television shows. An explanation might be that in sexualized television shows, cosmetic surgery is presented as a normal way to improve one's appearance (Slevec & Tiggemann, 2010). This normalization may lead women who frequently consume sexualized television to model the behavior in the shows, (Sharp et al., 2014). This effect might increase especially as women become older and thus show more signs of ageing. The underlying mechanisms of this imitation process remain to be studied. Furthermore, it would be interesting to see whether the link between STE and cosmetic surgery is reflected in actual surgery rates.

Limitations and Future Research Directions

Our results should be interpreted in the light of several limitations. First, our study is limited by its correlational design. Although experimental and longitudinal research indicates negative effects of the media on body image (Grabe et al., 2008; Ward, 2016), it might still be possible that women high on self-objectification specifically seek out sexualized television. Especially concerning cosmetic surgery consideration, experimental and longitudinal studies are necessary to further investigate the presented temporal order. Second, the majority of our participants had at least a high school diploma, suggesting that our sample was well-educated. Because lower socioeconomic status has been linked to higher television use (Stamatakis et al., 2009), future research should include samples with a more diverse educational background. Similarly, research is needed investigating the tested model with people of more diverse ethnic backgrounds and different genders. These studies should further include other forms of appearance-ideal internalization, for instance muscular-ideal internalization. The current study focused on thin-ideal internalization, which may not represent the ideal body type for other groups. Furthermore, this study examined sexualized television only. However, sexualized depictions are conveyed through many other media formats, e.g., social media like Instagram, which might be particularly important for adolescents (Skowronski et al., 2021). Future research should investigate these associations with diverse media types. Our study has been conducted in Germany, which means that some of television shows chosen to reflect STE are

only available on German television. However, many of the shows are international shows (e.g., “Sex and the City”) or exist in other countries in similar formats (e.g., “The Bachelor”). We therefore assume that our results extend to a broader audience beyond Germany.

Implications and conclusion

Despite these limitations, our research contributes to the literature by demonstrating links between sexualized media use and self-objectification for women across a broad age spectrum. This study is, to our knowledge, the first one to test media use and the premises of objectification theory for women beyond college age. By supporting the assumed model for all age groups and finding no moderating effect of age, our results further underscore objectification theory as a useful framework for describing the relations between media use and body image for women of all ages. They suggest that women beyond college age also experience negative effects of sexualized media that are documented extensively for younger women (Ward, 2016). In addition, this study connects sexualized media use with cosmetic surgery consideration. By highlighting the role of cosmetic surgery consideration as an outcome of both sexualized media use and self-objectification, this study further extends and supports objectification theory. The findings show that although age does not moderate the relations between media and self-objectification, it may moderate the assumed effect of sexualized media on consideration of cosmetic surgery. We recommend longitudinal research among women beyond young adulthood to support these claims.

References

- American Society of Plastic Surgeons. (2018). *2018 plastic surgery statistics report*. <https://www.plasticsurgery.org/documents/News/Statistics/2018/plastic-surgery-statistics-full-report-2018.pdf>
- APA Task Force on the Sexualization of Girls. (2007). *Report of the APA task force on the sexualization of girls*. <http://www.apa.org/pi/women/programs/girls/report-full.pdf>
- Bauer, D. J., & Curran, P. J. (2005). Probing interactions in fixed and multilevel regression: Inferential and graphical techniques. *Multivariate Behavioral Research*, *40*(3), 373–400. https://doi.org/10.1207/s15327906mbr4003_5
- Busching, R., Gentile, D. A., Krahe, B., Möller, I., Khoo, A., Walsh, D. A., & Anderson, C. A. (2015). Testing the reliability and validity of different measures of violent video game use in the United States, Singapore, and Germany. *Psychology of Popular Media Culture*, *4*(2), 97–111. <https://doi.org/10.1037/ppm0000004>
- Calogero, R. M. (2011). Operationalizing self-objectification: Assessment and related methodological issues. In R. M. Calogero, S. Tantleff-Dunn, & J. K. Thompson (Eds.), *Self-objectification in women: Causes, consequences, and counteractions* (pp. 23–49). American Psychological Association. <https://doi.org/10.1037/12304-002>
- Calogero, R. M., Pina, A., Park, L. E., & Rahemtulla, Z. (2010). Objectification theory predicts college women's attitudes toward cosmetic surgery. *Sex Roles*, *63*(1-2), 32–41. <https://doi.org/10.1007/s11199-010-9759-5>
- Clarke, L. H., & Korotchenko, A. (2011). Aging and the body: A review. *Canadian Journal on Aging = La Revue Canadienne Du Vieillissement*, *30*(3), 495–510. <https://doi.org/10.1017/S0714980811000274>
- Deutsche Gesellschaft für ästhetisch-plastische Chirurgie. (2020). *Zahlen, Fakten und Trends der ästhetisch-plastischen Chirurgie*. https://www.dgaepc.de/wp-content/uploads/2020/09/DGA%CC%88PC_Statistik-2019-2020_101120.pdf
- Erk, S., & Kloppenburg, G. (2016). *Analyse der Fernsehnutzung der 35- bis 55-Jährigen: „Generation Mitte“ sieht fern*. <https://www.ard-werbung.de/media-perspektiven/fachzeitschrift/2016/artikel/generation-mitte-sieht-fern/>
- Fredrickson, B. L., & Roberts, T.-A. (1997). Objectification theory: Toward understanding women's lived experiences and mental health risks. *Psychology of Women Quarterly*, *21*(2), 173–206. <https://doi.org/10.1111/j.1471-6402.1997.tb00108.x>

- Grabe, S., Ward, L. M., & Hyde, J. S. (2008). The role of the media in body image concerns among women: A meta-analysis of experimental and correlational studies. *Psychological Bulletin, 134*(3), 460–476. <https://doi.org/10.1037/0033-2909.134.3.460>
- Halliwell, E. (2015). Future directions for positive body image research. *Body Image, 14*, 177–189. <https://doi.org/10.1016/j.bodyim.2015.03.003>
- Hayes, A. F., & Scharkow, M. (2013). The relative trustworthiness of inferential tests of the indirect effect in statistical mediation analysis: Does method really matter? *Psychological Science, 24*(10), 1918–1927. <https://doi.org/10.1177/0956797613480187>
- Heidekrueger, P. I., Juran, S., Ehrl, D., Aung, T., Tanna, N., & Broer, P. N. (2017). Global aesthetic surgery statistics: A closer look. *Journal of Plastic Surgery and Hand Surgery, 51*(4), 270–274. <https://doi.org/10.1080/2000656X.2016.1248842>
- Henderson-King, D., & Henderson-King, E. (2005). Acceptance of cosmetic surgery: Scale development and validation. *Body Image, 2*(2), 137–149. <https://doi.org/10.1016/j.bodyim.2005.03.003>
- Hodge, J. M., Shah, R., McCullough, M. L., Gapstur, S. M., & Patel, A. V. (2020). Validation of self-reported height and weight in a large, nationwide cohort of U.S. Adults. *PloS One, 15*(4), e0231229. <https://doi.org/10.1371/journal.pone.0231229>
- Jackson, T., & Chen, H. (2015). Predictors of cosmetic surgery consideration among young Chinese women and men. *Sex Roles, 73*(5-6), 214–230. <https://doi.org/10.1007/s11199-015-0514-9>
- Karsay, K., Knoll, J., & Matthes, J. (2018). Sexualizing media use and self-objectification: A meta-analysis. *Psychology of Women Quarterly, 42*(1), 9-28. <https://doi.org/10.1177/0361684317743019>
- Krippendorff, K. (2018). *Content analysis: An introduction to its methodology*. Sage publications.
- Kupferschmitt, T., & Müller, T. (2020). *ARD/ZDF-Massenkommunikation 2020: Mediennutzung im Intermediavergleich*. <https://www.ard-zdf-massenkommunikation.de>
- Little, T. D., Rhemtulla, M., Gibson, K., & Schoemann, A. M. (2013). Why the items versus parcels controversy needn't be one. *Psychological Methods, 18*(3), 285–300. <https://doi.org/10.1037/a0033266>
- Moradi, B. (2011). Objectification theory: Areas of promise and refinement. *The Counseling Psychologist, 39*(1), 153–163. <https://doi.org/10.1177/0011000010384279>

- Moradi, B., & Varnes, J. R. (2017). Structure of the objectified body consciousness scale: Reevaluated 20 years later. *Sex Roles, 77*(5-6), 325–337. <https://doi.org/10.1007/s11199-016-0731-x>
- Noll, S. M., & Fredrickson, B. L. (1998). A mediational model linking self-objectification, body shame, and disordered eating. *Psychology of Women Quarterly, 22*(4), 623–636. <https://doi.org/10.1111/j.1471-6402.1998.tb00181.x>
- Raftery, A. E. (1995). Bayesian model selection in social research. *Sociological Methodology, 25*, 111–163. <https://doi.org/10.2307/271063>
- Schaefer, L. M., Harriger, J. A., Heinberg, L. J., Soderberg, T., & Kevin Thompson, J. (2017). Development and validation of the sociocultural attitudes towards appearance questionnaire-4-revised (SATAQ-4R). *The International Journal of Eating Disorders, 50*(2), 104–117. <https://doi.org/10.1002/eat.22590>
- Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online, 8*(2), 23–74.
- Sharp, G., Tiggemann, M., & Matiske, J. (2014). The role of media and peer influences in Australian women's attitudes towards cosmetic surgery. *Body Image, 11*(4), 482–487. <https://doi.org/10.1016/j.bodyim.2014.07.009>
- Sink, A., & Mastro, D. (2017). Depictions of gender on primetime television: A quantitative content analysis. *Mass Communication and Society, 20*(1), 3–22. <https://doi.org/10.1080/15205436.2016.1212243>
- Skowronski, M., Busching, R., & Krahe, B. (2021). Predicting adolescents' self-objectification from sexualized video game and Instagram use: A longitudinal study. *Sex Roles, 84*, 584–598. <https://doi.org/10.1007/s11199-020-01187-1>
- Slater, A., & Tiggemann, M. (2010). Body image and disordered eating in adolescent girls and boys: A test of objectification theory. *Sex Roles, 63*(1), 42–49. <https://doi.org/10.1007/s11199-010-9794-2>
- Slevec, J., & Tiggemann, M. (2010). Attitudes toward cosmetic surgery in middle-aged women: Body image, aging anxiety, and the media. *Psychology of Women Quarterly, 34*(1), 65–74. <https://doi.org/10.1111/j.1471-6402.2009.01542.x>
- Slevec, J., & Tiggemann, M. (2011). Media exposure, body dissatisfaction, and disordered eating in middle-aged women. *Psychology of Women Quarterly, 35*(4), 617–627. <https://doi.org/10.1177/0361684311420249>

- Smith, S. L., Choueiti, M., Prescott, A., & Pieper, K. (2012). *Gender roles & occupations: A look at character attributes and job-related aspirations in film and television*. Geena Davis Institute on Gender in Media. <https://seejane.org/wp-content/uploads/full-study-gender-roles-and-occupations-v2.pdf>
- Stamatakis, E., Hillsdon, M., Mishra, G., Hamer, M., & Marmot, M. (2009). Television viewing and other screen-based entertainment in relation to multiple socioeconomic status indicators and area deprivation: The Scottish Health Survey 2003. *Journal of Epidemiology and Community Health*, *63*(9), 734–740. <https://doi.org/10.1136/jech.2008.085902>
- Tiggemann, M., & Lynch, J. E. (2001). Body image across the life span in adult women: The role of self-objectification. *Developmental Psychology*, *37*(2), 243–253. <https://doi.org/10.1037/0012-1649.37.2.243>
- Tiggemann, M., & Williams, E. (2011). The role of self-objectification in disordered eating, depressed mood, and sexual functioning among women. *Psychology of Women Quarterly*, *36*(1), 66–75. <https://doi.org/10.1177/0361684311420250>
- Vandenbosch, L., & Eggermont, S. (2015). The role of mass media in adolescents' sexual behaviors: Exploring the explanatory value of the three-step self-objectification process. *Archives of Sexual Behavior*, *44*(3), 729–742. <https://doi.org/10.1007/s10508-014-0292-4>
- Ward, L. M. (2016). Media and sexualization: State of empirical research, 1995-2015. *Journal of Sex Research*, *53*(4-5), 560–577. <https://doi.org/10.1080/00224499.2016.1142496>
- Zurbriggen, E. L., Ramsey, L. R., & Jaworski, B. K. (2011). Self- and partner-objectification in romantic relationships: Associations with media consumption and relationship satisfaction. *Sex Roles*, *64*(7-8), 449–462. <https://doi.org/10.1007/s11199-011-9933-4>

Table 1
Means, Standard Deviations, Scale Ranges, and Zero-Order Correlations between All Variables

Variable	<i>M</i> (<i>SD</i>)	Possible range	1	2	3	4	5	6	7
1. Age	38.77 (13.40)	-							
2. Sexualized television exposure	10.65 (10.10)	0–100	-.15**						
3. Appearance-ideal internalization	2.22 (0.98)	1–5	-.36***	.10*					
4. Valuing appearance over competence	-12.06 (9.37)	-25–25	-.28***	.15**	.38***				
5. Body surveillance	2.95 (0.75)	1–5	-.39***	.10*	.54***	.49***			
6. Consideration of cosmetic surgery	2.35 (1.30)	1–5	-.24***	.24***	.36***	.32***	.41***		
7. Overall television use ¹	15.09 (7.93)	1–25	.34***	.34***	-.14**	-.08	-.10*	.02	
8. Body Mass Index (BMI)	23.92 (4.32)	-	.25***	.04	-.16**	-.15**	-.14**	.02	.22***

¹Frequency x intensity.

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

Table 2*Direct, Moderator and Indirect Paths in the Model Displayed in Figure 2*

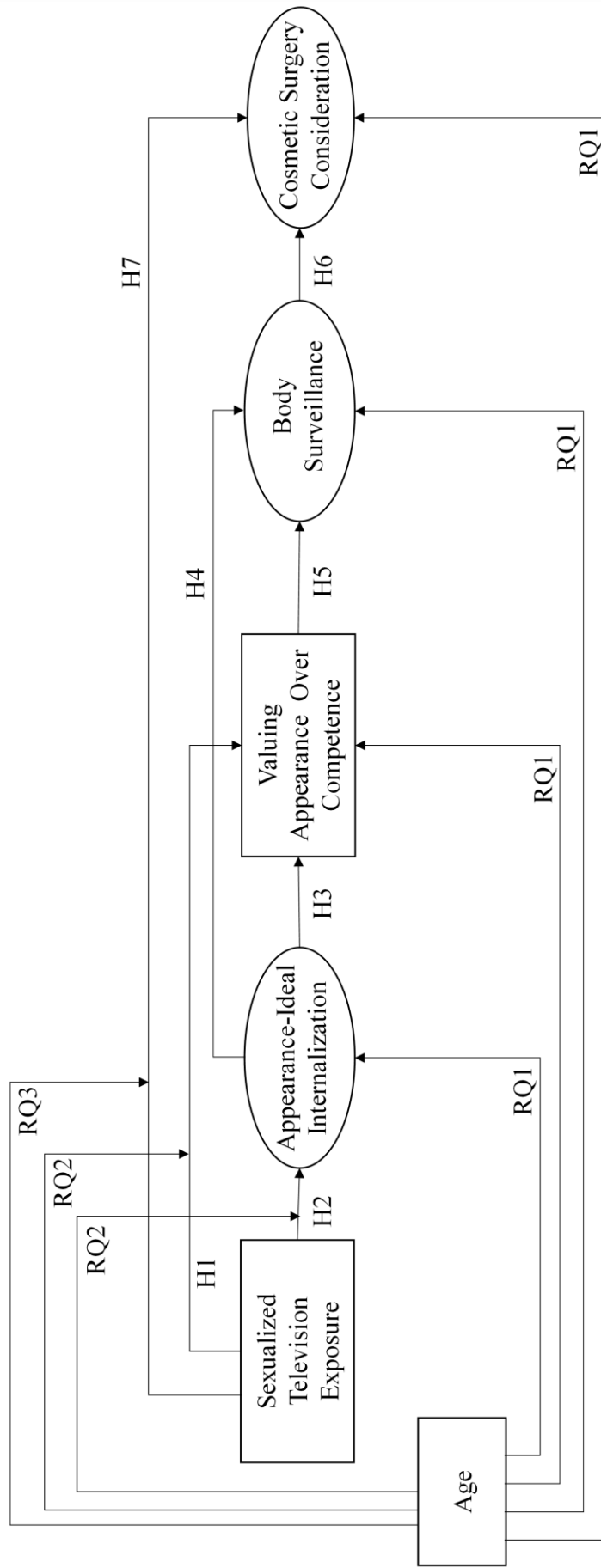
Direct paths	<i>b</i> [95 or 99% CI]	β
Sexualized television exposure → Valuing appearance over competence	0.94* [0.17, 1.74]	.10
Sexualized television exposure → Appearance-ideal internalization	0.07 [-0.04, 0.19]	.07
Appearance-ideal internalization → Valuing appearance over competence	2.94** [1.90, 4.00]	.34
Appearance-ideal internalization → Body surveillance	0.73** [0.49, 1.07]	.51
Valuing appearance over competence → Body surveillance	0.04** [0.02, 0.06]	.24
Body surveillance → Consideration of cosmetic surgery	0.37** [0.26, 0.50]	.48
Sexualized television exposure → Consideration of cosmetic surgery	0.22** [0.07, 0.38]	.19
Age → Appearance-ideal internalization	-0.03** [-0.04, -0.02]	-.34
Age → Valuing appearance over competence	-0.08* [-0.14, -0.01]	-.11
Age → Body surveillance	-0.03** [-0.04, -0.01]	-.24
Age → Consideration of cosmetic surgery	0.00 [-0.01, 0.01]	0.004
Moderator paths		
Sexualized television exposure x Age → Valuing appearance over competence	0.01 [-0.05, 0.08]	.02
Sexualized television exposure x Age → Appearance-ideal internalization	0.001 [-0.01, 0.01]	.01
Sexualized television exposure x Age → Consideration of cosmetic surgery	0.01* [0.002, 0.02]	.11
Indirect paths		
Sexualized television exposure → Appearance-ideal internalization → Valuing appearance over competence → Body surveillance → Consideration of cosmetic surgery	0.003 [-0.001, 0.01]	.003
Sexualized television exposure → Valuing appearance over competence → Body surveillance → Consideration of cosmetic surgery	0.01* [0.003, 0.03]	.01

For nonsignificant results, the 95% CIs are presented.

* $p < .05$ [95% CI], ** $p < .01$ [99% CI].

Figure 1

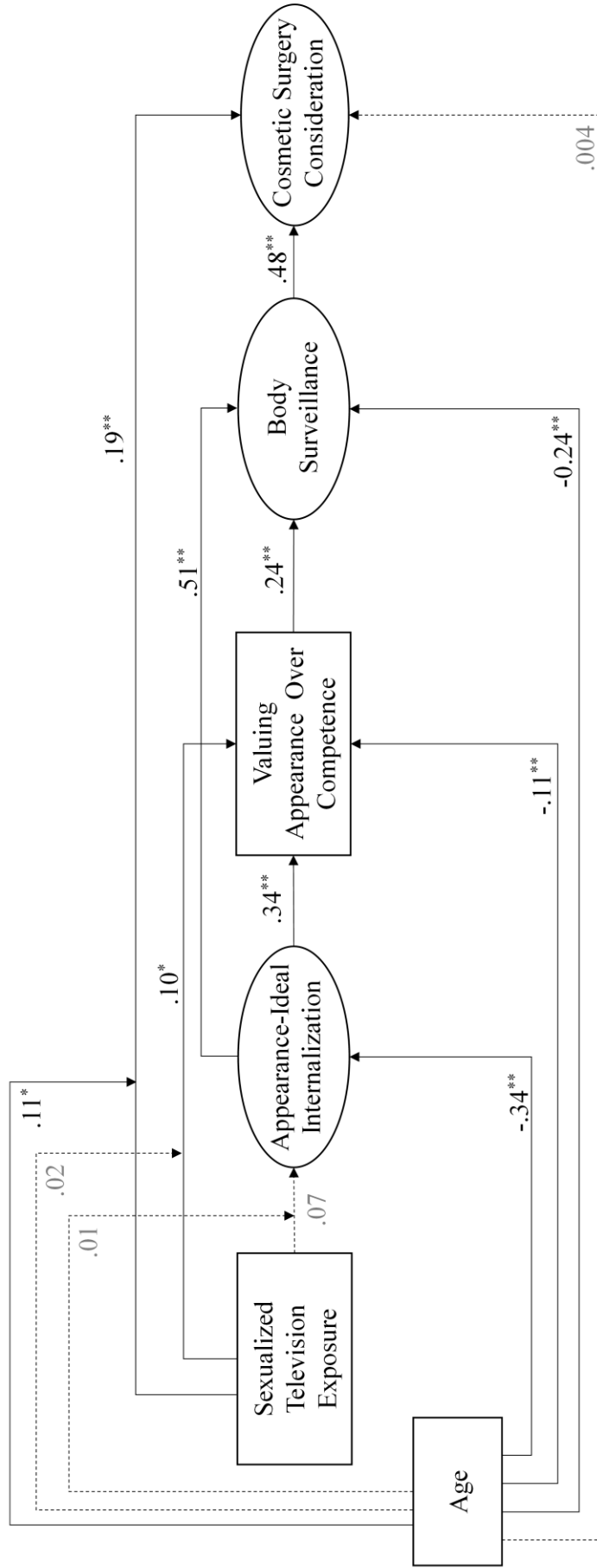
Proposed Model of the Relations between Age, STE, Internalization, Valuing Appearance, Body Surveillance, and Consideration of Cosmetic Surgery



Note. The proposed indirect paths are not shown in the model.

Figure 2

Path Coefficients for the Relations between Age, STE, Internalization, Valuing Appearance, Body Surveillance and Consideration of Cosmetic Surgery

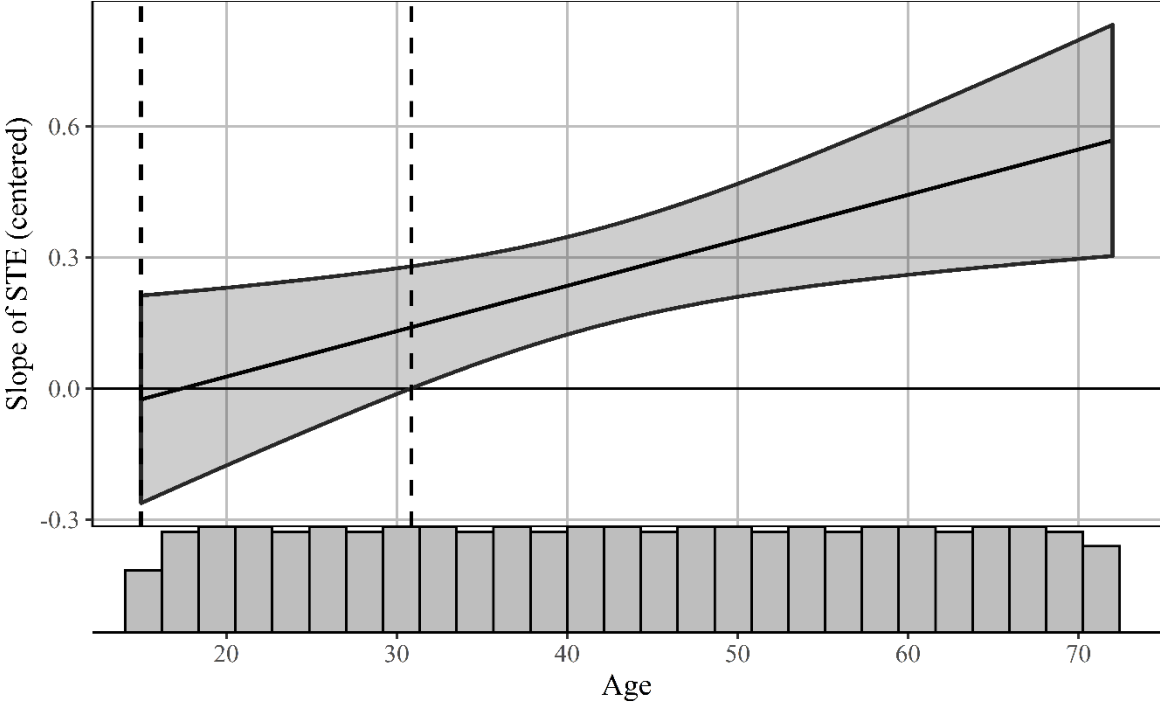


Note. All variables controlled for overall television use and BMI.

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

Figure 3

Histogram of Age and Simple Slope and 95% Confidence Interval for Sexualized Television Exposure (STE) on Consideration of Cosmetic Surgery for Different Values of Age



Note. Dashed lines indicate the critical values for which the 95% confidence interval includes zero., designating nonsignificant associations.

6 Study 3: Links between exposure to sexualized Instagram images and body image concerns in girls and boys⁵

Abstract

The current study examined the links between viewing female and male sexualized Instagram images (SII) and body image concerns within the three-step process of self-objectification among adolescents aged 13 to 18 years from Germany ($N = 300$, 61% female). Participants completed measures of SSI use, thin-ideal and muscular-ideal internalization, valuing appearance over competence, and body surveillance. Structural equation modeling revealed that SII use was associated with body image concerns for boys and girls. Specifically, female SII use was indirectly associated with higher body surveillance via thin-ideal internalization and subsequent valuing appearance over competence for girls. For both girls and boys, male SII use was indirectly linked to higher body surveillance via muscular-ideal internalization. Implications for the three-step model of self-objectification within sexualized social media are discussed.

Keywords: social media; sexualization; body image concerns; self-objectification; body surveillance; Instagram

⁵ Skowronski, M., Busching, R., & Krahe, B. (in press). Links between exposure to sexualized Instagram images and body image concerns in girls and boys. *Journal of Media Psychology*.

Links between Exposure to Sexualized Instagram Images and Body Image Concerns in Girls and Boys

Instagram is one of the fastest growing social networks and is most popular among teenagers, of whom 72% are using it (Pew Research Center, 2018). With over 100 million photos uploaded on Instagram per day (Instagram, 2019), adolescents are likely to be exposed to a high number of images on a regular basis. There is a large body of research linking sexualized media, defined as media emphasizing sexual appearance and sexual appeal to others, to body image concerns (Karsay et al., 2018; Ward, 2016). Yet scholars have called for more research focusing on social media specifically and including male samples (Ward, 2016). The purpose of this study is to examine associations between adolescents' use of sexualized Instagram images and body image concerns, conceptualized here as appearance-ideal internalization (thin- and muscular-ideal), valuing appearance over competence, and body surveillance. The study extends previous research by examining the specific association of exposure to both male and female sexualized Instagram images (SII), by examining the role of different forms of appearance-ideal internalization (thin and muscular ideal), and by including both male and female adolescents.

Sexualized Media Use and Self-Objectification

A well-supported theoretical framework for understanding the relation of media exposure with body image is objectification theory (Fredrickson & Roberts, 1997). The theory states that women in Western culture learn from an early age that their body is evaluated by others and gradually internalize this observer perspective, thereby learning to evaluate themselves from a third-person, appearance-focused point of view. This process is called self-objectification and has been linked to numerous negative outcomes for women (Tiggemann & Williams, 2011). Self-objectification is manifested at the cognitive level in individuals' tendency to value appearance over competence (further referred to as valuing appearance); at the behavioral level, it is shown through persistent body surveillance (Calogero, 2011). Following objectification theory, sexualized media constitute one form of objectification and contribute to the development of self-objectification (Fredrickson & Roberts, 1997). Accordingly, an extensive body of correlational research has demonstrated links between the use of sexualized media and self-objectification, and experimental research demonstrated that women exposed to sexualized media in the lab show heightened self-objectification (Karsay et al., 2018; Ward, 2016).

Media researchers have further identified women's tendency to internalize the society's appearance ideal as a mediator in this relation. A prominent model featuring appearance-ideal internalization is the three-step model of self-objectification by Vandenberg and Eggermont (2015). The authors postulate that sexualized media predict valuing appearance directly and indirectly via appearance-ideal internalization. Both of these facets then increase body surveillance. This model has been tested with adolescents' traditional media use and general Facebook use (Vandenberg & Eggermont, 2012, 2015).

Self-Objectification and Gender

Objectification theory was originally developed to describe the experiences of women. Yet sexualized portrayals of men in the media have increased in past decades, resulting in more pressure for boys to be muscular and look sexy (Vandenberg & Eggermont, 2013). Research is needed to clarify whether the relations between sexualized media and self-objectification are similar among boys and girls (Moradi, 2010). So far, studies have found that female and male adolescents' use of sexualized traditional media (Vandenberg & Eggermont, 2012, 2015), and SII use (Skowronski et al., 2021) predict self-objectification via appearance-ideal internalization, with no evidence of a moderating effect of gender. However, these studies did not take the gender of the sexualized media subjects into account, which may also be relevant for the relation between media use and self-objectification. The essential proposition of objectification theory is that women internalize an outside-perspective on themselves because they experience objectification through sexualization of women (Fredrickson & Roberts, 1997). In the same fashion, men should internalize this perspective through experiences of male sexualization. On Instagram, sexualized women primarily convey the standard of thinness, and research has demonstrated that thin-ideal internalization is an essential variable for girls (Thompson & Stice, 2001). By contrast, male sexualization typically focusses on muscularity and strength (Carrotte et al., 2017). Accordingly, previous studies have shown that exposure to thin-ideal images increases body image concerns in girls, but not in boys (Hargreaves & Tiggemann, 2004). Male body image concerns are more closely linked to the muscular ideal (Thompson & Cafri, 2007). It may thus be reasoned that female images are associated with thin-ideal internalization for girls, and male images are linked to muscular-ideal internalization for boys (Moradi, 2010).

Sexualization on Instagram

Studies that specifically measure the habitual consumption of sexualized images on Instagram are rare. At the same time, Instagram is a purely picture-based platform, and users

may encounter images of both peers and celebrities simultaneously on the platform, possibly rendering sexualized images more relevant to their body image concerns (Holland & Tiggemann, 2016). Most importantly, Instagram is known for the wide-spread use of appearance-based hashtags (Tiggemann & Zaccardo, 2018) and its particularly large amount of male sexualized images (Carrotte et al., 2017). Because Instagram is especially popular among teenagers (Medienpädagogischer Forschungsverbund Südwest, 2019), research is needed on links between male and female images on Instagram and adolescents' body image concerns. Examining the differential use of, and pathways from, sexualized male and female images, Instagram is a relevant object of study because it addresses both thinness and muscularity, as reflected in popular hashtags like #thinspiration and #fitspiration (Carrotte et al., 2017; Ghaznavi & Taylor, 2015). Previous studies examining social media either focused on general measures of internalization without differentiating between thinness and muscularity (Vandenbosch & Eggermont, 2015) or did not differentiate between the gender of the sexualized persons (Skowronski et al., 2021). Thus, the proposition that sexualized Instagram images of males and females may be differentially associated with thin-ideal and muscular-ideal internalization for girls and boys has not yet been tested.

The Current Study

To address these limitations, the current research measured boys' and girls' use of male and female SII and tested associations in an extended model derived from the three-step self-objectification process (Vandenbosch & Eggermont, 2015). The prediction model is presented in Figure 1. Extending previous research, we predicted gender differences in the relations between male and female SII and facets of internalization. Specifically, we assumed that for girls, female SII would be linked to thin-ideal internalization (Hypothesis 1a) and valuing appearance (Hypothesis 2a), whereas for boys, male SII would be linked to muscular-ideal internalization (Hypothesis 1b) and valuing appearance (Hypothesis 2b). For both genders, we assumed that valuing appearance would be predicted by thin-ideal internalization (Hypothesis 3) and muscular-ideal internalization (Hypothesis 4). We further assumed that higher thin-ideal, muscular-ideal internalization, and valuing appearance would predict greater body surveillance (Hypothesis 5). Finally, we hypothesized that higher use of gender-congruent SII (female SII for girls, male SII for boys) would be indirectly linked to greater body surveillance via thin-ideal internalization and valuing appearance for girls and via muscular-ideal internalization and valuing appearance for boys (Hypothesis 6).

Method

Participants

Participants were recruited by spreading the link to the online survey via secondary school teachers, youth club leaders, and Instagram. Of the 379 adolescents who started filling in the survey, 313 reached the end of the survey (dropout rate of 17.41%). Thirteen participants were excluded (nine did not specify their gender, four did not answer the Instagram questions), resulting in a final sample of $N = 300$ (183 female, 117 male) with a mean age of $M = 15.46$ years ($SD = 1.38$). Participants could opt to take part in a raffle of Amazon vouchers worth 10€.

Instruments

Use of sexualized Instagram images (SII use)

Participants were shown three pictures of sexualized women and three pictures of sexualized men taken from public Instagram profiles. The pictures showed young adults in various forms of scarce clothing and body-emphasizing poses. Pictures were validated in a pilot study (described in the Electronic Supplementary Material, ESM 1)⁶ and are available upon request. For each picture, participants were asked to rate how often they see similar pictures on Instagram on a 5-point scale from 1 (*never*) to 5 (*very often*). Participants were told that they should not focus on the specific persons but on the way in which they were presented (e.g., clothing, pose). Cronbach's alphas were .85 for the female SII scale and .83 for the male version.

Appearance-ideal internalization

The Thin/Low Body Fat and the Muscular/Athletic subscales of the Sociocultural Attitudes towards Appearance Questionnaire-4R (SATAQ-4R) were used (Schaefer et al., 2017). Participants rated the extent to which they strive toward appearance ideals on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The Thin subscale consisted of three items (e.g., "I want my body to be very thin"), $\alpha = .84$, the Muscular subscale of four items (e.g., "It is important for me to look muscular"), $\alpha = .93$.

Valuing appearance

Valuing appearance was assessed by an adapted version of the Self-Objectification Questionnaire (Noll & Fredrickson, 1998; Vandenbosch & Eggermont, 2012). Participants were asked to rate the importance of ten body attributes (e.g., weight, physical fitness) from 1

⁶ The supplementary material of this study can be found online via the respective article.

(*not at all important*) to 10 (*very important*). The difference between participants' mean scores on the appearance-based scale ($\alpha = .79$) and the competence-based scale ($\alpha = .83$) determined participant's score of valuing appearance. A factor analysis confirmed the two-factorial structure (see ESM 2).

Body surveillance

An adapted version for German adolescents of the Surveillance subscale of the Objectified Body Consciousness Scale was used (Knauss et al., 2008; McKinley & Hyde, 1996). The scale consisted of 11 items (e.g., "During the day, I think about how I look many times"), rated on a scale from 1 (*strongly disagree*) to 4 (*strongly agree*), $\alpha = .84$. Following the procedure of previous research (Sevic et al., 2020; Vandenbosch & Eggermont, 2015), four items of the body surveillance subscale were used to create the latent variable.⁷

Control variable

To control for participants' overall Instagram use, participants indicated on a scale from 1 (*not at all*) to 7 (*more than 20 times*) how often they check Instagram on an average day. They further reported how much time they spend on Instagram on a typical day on a scale from 1 (*no time at all*) to 7 (*4 hours or more*). The product of frequency and intensity was calculated to yield a score of overall Instagram use.

Procedure

The study was conducted online using the Limesurvey software. After providing informed consent, participants completed the body image measures followed by the Instagram questionnaires, before they were debriefed online. The study was approved by the Ethics Committee of the authors' university.

Overview of Bayesian Analysis

To test our hypotheses, we used modern Bayesian methodology, which has gained popularity in psychological research (van de Schoot et al., 2017). This approach enabled us to translate our theoretical expectations into prior distributions, which were then incorporated into the analysis to test the probability of the hypothesized model, given the data (Muthén & Asparouhov, 2012). Furthermore, the Bayesian approach offers several advantages over frequentist approaches for evaluating our proposed model: First, it does not rely on large samples sizes. Second, population parameters (e.g., means or regression coefficients) are

⁷ We tested the same model with all items of the body surveillance scale. The results remained unchanged except for a slight decrease in model fit.

described by probability distributions, which reflect beliefs about the uncertainty about the population parameters rather than assuming one unknown, but fixed true value, like in frequentist approaches. Third, when examining complex models as in this study, frequentist approaches often pose overly strict assumptions because they assume exact zero cross-loadings and exact invariance between constructs. By contrast, Bayesian methodology allows for some “wobble room” by applying prior distributions centered around zero to difference parameters and cross-loadings (Winter & Depaoli, 2020).

Results

Descriptive Statistics and Correlations

Differences between boys and girls were tested with SPSS 26 using one-way analyses of variance instead of multivariate analysis of variance, which uses listwise deletion. An alpha level of $p < .006$ ($.05/8$) was used to correct for multiple comparisons. Table 1 displays the descriptive statistics and zero-order correlations for all study variables. Gender differences were found on all variables, with girls scoring higher on all variables except for muscular-ideal internalization, on which boys had higher scores. Male and female SSI use significantly correlated with each other and with muscular-ideal internalization for boys and girls. For girls, female SII use correlated with thin-ideal internalization. Female SII use (for boys and girls) and male SII use (for boys) were correlated with body surveillance. SII use and valuing appearance was uncorrelated.

Hypothesis Testing

To examine the proposed paths and gender differences in the associations, the structural equation model presented in Figure 1 was tested using latent class analyses with Mplus 8.5. For female SII, male SII, thin- and muscular-ideal internalization, and body surveillance, the respective items were used as indicators of the latent variables. Due to its rank-order format, we included valuing appearance as a manifest variable in the model. All variables were controlled for general Instagram use and age. Relying on our assumptions, we applied normally distributed zero-mean small variance prior distributions (variance of 0.01) to the differences between factor loadings and item intercepts for boys and girls and to the differences between the paths supposed to be equal for boys and girls, reflecting the assumption that the findings would not vary by gender. The priors of the loadings of the items for SII and internalization on the non-expected latent factor were set to a normally distributed zero mean with a small variance (0.01). Uninformative Mplus default priors were applied to all other model parameters. No differences between boys and girls in the factor loadings and item intercepts were

significant, indicating approximate strong measurement invariance across gender groups. The model showed a good fit, $PPP < 0.001$, $CFI = .95$, $RMSEA = .05$. The standardized coefficients are presented in Figure 2. To test the significance of both direct and indirect paths, 95% Bayesian credibility intervals were calculated, which are presented in Table 2.

Hypothesis 1a that female SII would be associated with heightened thin-ideal internalization for girls, but not for boys was confirmed. Furthermore, male SII was linked to muscular-ideal internalization for boys, consistent with Hypothesis 1b. Against our prediction, male SSI also predicted muscular-ideal internalization in girls. The proposed positive paths to valuing appearance from female SII for girls and from male SII for boys were not significant, failing to support Hypotheses 2a and 2b. As predicted in Hypothesis 3, thin-ideal internalization predicted valuing appearance for girls and boys. However, muscular-ideal internalization did not predict valuing appearance, lending no support to Hypothesis 4. We further found that thin- and muscular-ideal internalization and valuing appearance predicted body surveillance for boys and girls, consistent with Hypothesis 5. In Hypothesis 6, we proposed indirect links from gender-congruent SII (female for girls, male for boys) to body surveillance via internalization (thin-ideal for girls, muscular-ideal for boys) and valuing appearance. This prediction was supported for girls only. For boys, we found indirect links from male SII to body surveillance only via internalization. We also found evidence that male SII was indirectly linked to body surveillance via muscular-ideal internalization for girls.

Discussion

The current study used objectification theory (Fredrickson & Roberts, 1997) to examine the role of exposure to gendered sexualized images in adolescents' habitual Instagram use for understanding self-objectification. Expanding previous models (Vandenbosch & Eggermont, 2015), we investigated both muscular-ideal and thin-ideal internalization in this relation. Consistent with our hypotheses, female SII use was associated with body surveillance indirectly via thin-ideal internalization and valuing appearance for girls. Furthermore, male SII use was indirectly linked to body surveillance via muscular-ideal internalization for both gender groups. While female images are associated with the thin ideal for girls, male sexualization highlights the muscular body ideal for both boys and girls. This result might mirror the current shift in female appearance ideals in the context of Instagram: Having a muscular body has become an important trend among girls, and male pictures are presented at a substantial rate in this context (Tiggemann & Zaccardo, 2018). This makes it more likely for girls to internalize the muscular

ideal when seeing male sexualized images, which usually emphasize muscularity (Vandenbosch & Eggermont, 2013).

On the whole, our results suggest that sexualization on Instagram might contribute to adolescents' body image concerns, similar to sexualized content in traditional media (Karsay et al., 2018). However, as a social medium, Instagram may have implications for the further development of objectification theory: Users typically follow similar accounts along with their peers, which renders using Instagram a socially shared experience. For instance, users often discuss the bodies of the individuals they see on Instagram, which might intensify the links between sexualized images and self-objectification (Wang et al., 2020). Future research is needed to examine these assumptions. It would further be interesting to test whether body-positive content on Instagram might buffer this proposed effect, as it might lead individuals to question body ideals.

Against our predictions, we did not find direct paths from female and male SII use to valuing appearance. Moreover, we did not find a significant path from muscular-ideal internalization to valuing appearance. A reason may be that valuing appearance reflects the tendency to value appearance attributes like weight and shape, associated with the thin ideal, over competency attributes like fitness and strength, associated with muscularity. If people score high on muscular-ideal internalization, they might not value appearance over competence, or even value the competence attributes over appearance. Overall, our study underlines the need for more research on the concepts of thin- and muscular-ideal internalization and their relevance for valuing appearance.

Limitations

The current study is limited by its correlational design. As such, it cannot support statements about the causal order of the model variables. However, longitudinal and experimental studies confirm the temporal order assumed in our study (Ward, 2016). Therefore, our results are consistent with the proposition that habitual SII use may negatively affect male and female adolescents' body image. Following Slater's (2007) theory on reinforcing spirals, adolescents with a negative body image might specifically select media high in sexualization. Longitudinal designs are needed to test this possibility. Indeed, recent longitudinal research found evidence for reverse relationships between appearance-ideal internalization and body surveillance (Vangeel et al., 2018). Future research should further control for user variables like body mass index (BMI), which was not assessed in this study. However, some research speaks

against the role of BMI as a covariate in the association between sexualized media use and self-objectification (Skowronski et al., 2021).

In sum, our findings provide support for objectification theory (Fredrickson & Roberts, 1997) and the three-step process of self-objectification (Vandenbosch & Eggermont, 2015). They also have theoretical implications for the growing literature on male sexualization and self-objectification. The findings highlight the central and gendered role of appearance-ideal internalization, with muscular-ideal internalization being relevant for boys and both thin- and muscular-ideal internalization being relevant for girls. Therefore, muscular-ideal internalization should be included in future research. Together, the findings show that SII use is linked to body image concerns for both boys and girls, but the relevant stimuli might differ between genders: Female and male sexualized images relate to body image concerns for girls, whereas for boys, male images appear to be more relevant. As male sexualization in the media increases, this is an important finding for intervention programmes which should target boys and girls alike and take gendered preferences for sexualized media content into account.

References

- Calogero, R. M. (2011). Operationalizing self-objectification: Assessment and related methodological issues. In R. M. Calogero, S. Tantleff-Dunn, & J. K. Thompson (Eds.), *Self-objectification in women: Causes, consequences, and counteractions* (pp. 23–49). American Psychological Association. <https://doi.org/10.1037/12304-002>
- Carrotte, E. R., Prichard, I., & Lim, M. S. C. (2017). “Fitspiration” on social media: A content analysis of gendered images. *Journal of Medical Internet Research, 19*(3), e95. <https://doi.org/10.2196/jmir.6368>
- Fredrickson, B. L., & Roberts, T.-A. (1997). Objectification theory: Toward understanding women’s lived experiences and mental health risks. *Psychology of Women Quarterly, 21*(2), 173–206. <https://doi.org/10.1111/j.1471-6402.1997.tb00108.x>
- Ghaznavi, J., & Taylor, L. D. (2015). Bones, body parts, and sex appeal: An analysis of #thinspiration images on popular social media. *Body Image, 14*, 54–61. <https://doi.org/10.1016/j.bodyim.2015.03.006>
- Hargreaves, D. A., & Tiggemann, M. (2004). Idealized media images and adolescent body image: “Comparing” boys and girls. *Body Image, 1*(4), 351–361. <https://doi.org/10.1016/j.bodyim.2004.10.002>
- Holland, G., & Tiggemann, M. (2016). A systematic review of the impact of the use of social networking sites on body image and disordered eating outcomes. *Body Image, 17*, 100–110. <https://doi.org/10.1016/j.bodyim.2016.02.008>
- Instagram. (2019). *Instagram statistics*. <https://instagram-press.com/our-story/>
- Karsay, K., Knoll, J., & Matthes, J. (2018). Sexualizing media use and self-objectification: A meta-analysis. *Psychology of Women Quarterly, 42*(1), 9–28. <https://doi.org/10.1177/0361684317743019>
- Knauss, C., Paxton, S. J., & Alsaker, F. D. (2008). Body dissatisfaction in adolescent boys and girls: Objectified body consciousness, internalization of the media body ideal and perceived pressure from media. *Sex Roles, 59*(9-10), 633–643. <https://doi.org/10.1007/s11199-008-9474-7>
- McKinley, N. M., & Hyde, J. S. (1996). The objectified body consciousness scale: Development and validation. *Psychology of Women Quarterly, 20*(2), 181–215. <https://doi.org/10.1111/j.1471-6402.1996.tb00467.x>
- Medienpädagogischer Forschungsverbund Südwest. (2019). *JIM-Studie 2019: Jugend, Information, Medien (JIM Study 2019: Youth, Information, Media)*. <https://www.mpfs.de/studien/jim-studie/2019/>

- Moradi, B. (2010). Addressing gender and cultural diversity in body image: Objectification theory as a framework for integrating theories and grounding research. *Sex Roles, 63*(1-2), 138–148. <https://doi.org/10.1007/s11199-010-9824-0>
- Muthén, B., & Asparouhov, T. (2012). Bayesian structural equation modeling: A more flexible representation of substantive theory. *Psychological Methods, 17*(3), 313–335. <https://doi.org/10.1037/a0026802>
- Noll, S. M., & Fredrickson, B. L. (1998). A mediational model linking self-objectification, body shame, and disordered eating. *Psychology of Women Quarterly, 22*(4), 623–636. <https://doi.org/10.1111/j.1471-6402.1998.tb00181.x>
- Pew Research Center. (2018). *Teens, social media & technology 2018*. http://www.pewinternet.org/wp-content/uploads/sites/9/2018/05/PI_2018.05.31_TeensTech_FINAL.pdf
- Schaefer, L. M., Harriger, J. A., Heinberg, L. J., Soderberg, T., & Kevin Thompson, J. (2017). Development and validation of the sociocultural attitudes towards appearance questionnaire-4-revised (SATAQ-4R). *The International Journal of Eating Disorders, 50*(2), 104–117. <https://doi.org/10.1002/eat.22590>
- Sevic, S., Ciprić, A., Buško, V., & Štulhofer, A. (2020). The relationship between the use of social networking sites and sexually explicit material, the internalization of appearance ideals and body self-surveillance: Results from a longitudinal study of male adolescents. *Journal of Youth and Adolescence, 49*(2), 383–398. <https://doi.org/10.1007/s10964-019-01172-2>
- Skowronski, M., Busching, R., & Krahé, B. (2021). Predicting adolescents' self-objectification from sexualized video game and Instagram use: A longitudinal study. *Sex Roles, 84*, 584-598. <https://doi.org/10.1007/s11199-020-01187-1>
- Slater, M. D. (2007). Reinforcing spirals: The mutual influence of media selectivity and media effects and their impact on individual behavior and social identity. *Communication Theory, 17*(3), 281–303. <https://doi.org/10.1111/j.1468-2885.2007.00296.x>
- Thompson, J. K., & Cafri, G. (2007). *The muscular ideal: Psychological, social, and medical perspectives*. American Psychological Association. <https://doi.org/10.1037/11581-000>
- Thompson, J. K., & Stice, E. (2001). Thin-ideal internalization: Mounting evidence for a new risk factor for body-image disturbance and eating pathology. *Current Directions in Psychological Science, 10*(5), 181–183. <https://doi.org/10.1111/1467-8721.00144>

- Tiggemann, M., & Williams, E. (2011). The role of self-objectification in disordered eating, depressed mood, and sexual functioning among women. *Psychology of Women Quarterly*, *36*(1), 66–75. <https://doi.org/10.1177/0361684311420250>
- Tiggemann, M., & Zaccardo, M. (2018). ‘Strong is the new skinny’: A content analysis of #fitspiration images on Instagram. *Journal of Health Psychology*, *23*(8), 1003–1011. <https://doi.org/10.1177/1359105316639436>
- van de Schoot, R., Winter, S. D., Ryan, O., Zondervan-Zwijnenburg, M., & Depaoli, S. (2017). A systematic review of Bayesian articles in psychology: The last 25 years. *Psychological Methods*, *22*(2), 217–239. <https://doi.org/10.1037/met0000100>
- Vandenbosch, L., & Eggermont, S. (2012). Understanding sexual objectification: A comprehensive approach toward media exposure and girls’ internalization of beauty ideals, self-objectification, and body surveillance. *Journal of Communication*, *62*(5), 869–887. <https://doi.org/10.1111/j.1460-2466.2012.01667.x>
- Vandenbosch, L., & Eggermont, S. (2013). Sexualization of adolescent boys. *Men and Masculinities*, *16*(3), 283–306. <https://doi.org/10.1177/1097184X13477866>
- Vandenbosch, L., & Eggermont, S. (2015). The role of mass media in adolescents’ sexual behaviors: Exploring the explanatory value of the three-step self-objectification process. *Archives of Sexual Behavior*, *44*(3), 729–742. <https://doi.org/10.1007/s10508-014-0292-4>
- Vangeel, L., Vandenbosch, L., & Eggermont, S. (2018). The multidimensional self-objectification process from adolescence to emerging adulthood. *Body Image*, *26*, 60–69. <https://doi.org/10.1016/j.bodyim.2018.05.005>
- Wang, Y., Wang, X., Yang, J., Zeng, P., & Lei, L. (2020). Body talk on social networking sites, body surveillance, and body shame among young adults: The roles of self-compassion and gender. *Sex Roles*, *82*(11-12), 731–742. <https://doi.org/10.1007/s11199-019-01084-2>
- Ward, L. M. (2016). Media and sexualization: State of empirical research, 1995-2015. *Journal of Sex Research*, *53*(4-5), 560–577. <https://doi.org/10.1080/00224499.2016.1142496>
- Winter, S. D., & Depaoli, S. (2020). An illustration of Bayesian approximate measurement invariance with longitudinal data and a small sample size. *International Journal of Behavioral Development*, *44*(4), 371–382. <https://doi.org/10.1177/0165025419880610>

Table 1

Zero-order Correlations among All Variables for Girls (above the Diagonal) and Boys (below the Diagonal) and Means and SDs

	1	2	3	4	5	6	7	8
1. Age		.19**	.19**	.09	.07	.04	.09	.03
2. Instagram use ¹	.07		.18*	.27***	-.01	.01	.09	.13
3. Female SII	.14	.32***		.70***	.25**	.23**	.03	.26***
4. Male SII	.13	.05	.58***		.04	.22**	.02	.13
5. Thin-ideal internalization	.07	.15	-.08	-.03		.31***	.35***	.39***
6. Muscular-ideal internalization	.02	.24*	.30**	.29**	.03		-.03	.24***
7. Valuing appearance	-.03	.06	.00	-.11	.24**	-.05		.44***
8. Body surveillance	.04	.14	.26**	.29**	.18*	.44***	.09	
<i>M (SD) for girls</i>	15.56 (1.09)	17.57 (10.63)	3.26 (1.03)	2.43 (1.00)	3.07 (1.05)	2.04 (0.88)	-0.16 (1.74)	3.06 (0.66)
<i>M (SD) for boys</i>	15.29 (1.73)	10.81 (9.77)	2.85 (1.19)	1.91 (0.86)	2.11 (0.90)	3.33 (1.05)	-0.88 (1.59)	2.51 (0.66)
<i>F Gender difference</i>	2.79	30.76***	10.41**	20.91***	66.21***	131.17***	13.02***	48.02***

Note: SSI = use of sexualized Instagram images. Valuing appearance = valuing appearance over competence.

¹ Frequency x intensity.

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

Table 2*Direct and Indirect Paths in the Model*

Direct paths (standardized)	Girls	Boys
Female SII → Thin-ideal internalization	.26* [.10, .42]	-.13 [-.37, .11]
Female SII → Valuing appearance	-.33 [-.78, .09]	.21 [-.14, .60]
Male SII → Muscular-ideal internalization	.31* [.15, .47]	.34* [.12, .54]
Male SII → Valuing appearance	.29 [-.14, .77]	-.21 [-.60, .16]
Thin-ideal internalization → Valuing appearance	.44* [.30, .59]	.36* [.22, .50]
Thin-ideal internalization → Body surveillance	.27* [.10, .43]	.20* [.05, .37]
Muscular-ideal internalization → Valuing appearance	-.12 [-.27, .01]	-.12 [-.30, .06]
Muscular-ideal internalization → Body surveillance	.27* [.13, .41]	.44* [.24, .62]
Valuing appearance → Body surveillance	.35* [.21, .49]	.19* [.01, .36]
Indirect paths (standardized)	Girls	Boys
Female SII → Thin-ideal internalization → Body surveillance	.07* [.02, .14]	-.02 [-.09, .02]
Female SII → Valuing appearance → Body surveillance	-.11 [-.29, .03]	.03 [-.03, .15]
Female SII → Thin-ideal internalization → Valuing appearance → Body surveillance	.04* [.01, .08]	-.01 [-.03, .01]
Male SII → Muscular-ideal internalization → Body surveillance	.08* [.03, .16]	.14* [.04, .28]
Male SII → Valuing appearance → Body surveillance	.10 [-.05, .28]	-.03 [-.15, .03]
Male SII → Muscular-ideal internalization → Valuing appearance → Body surveillance	-.01 [-.04, .001]	-.01 [-.03, .004]

Note. SSI = use of sexualized Instagram images. Valuing appearance = valuing appearance over competence.

* $p < .05$ [95% Bayesian CI].

Figure 1

Proposed Model of the Relations between Female and Male SII Use, Thin- and Muscular-Ideal Internalization, Valuing Appearance and Body Surveillance. H1-H6 refer to hypotheses 1-6.

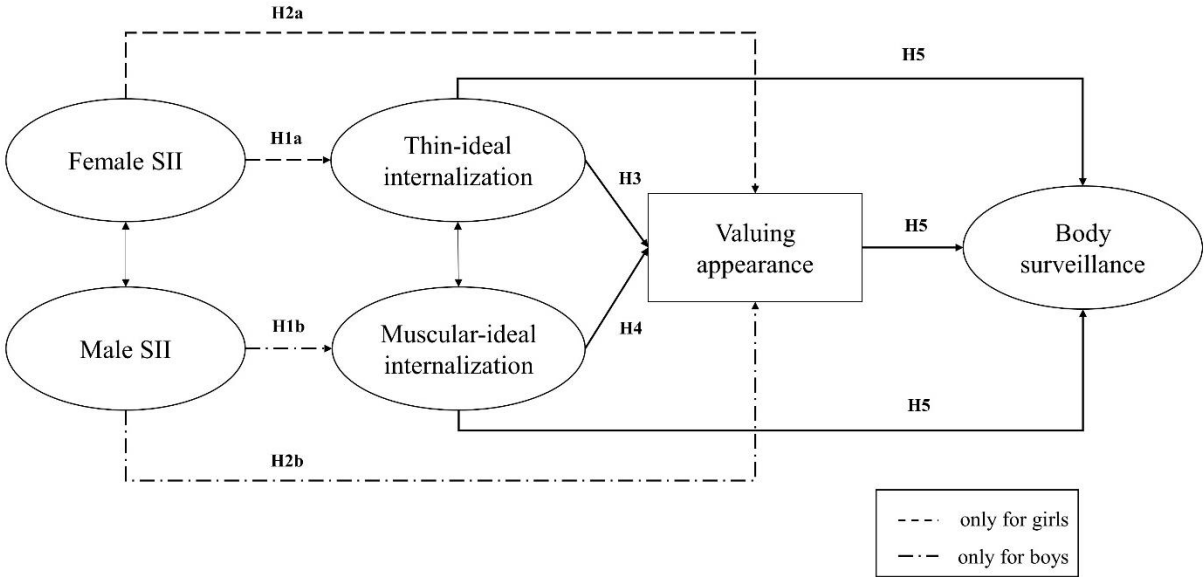
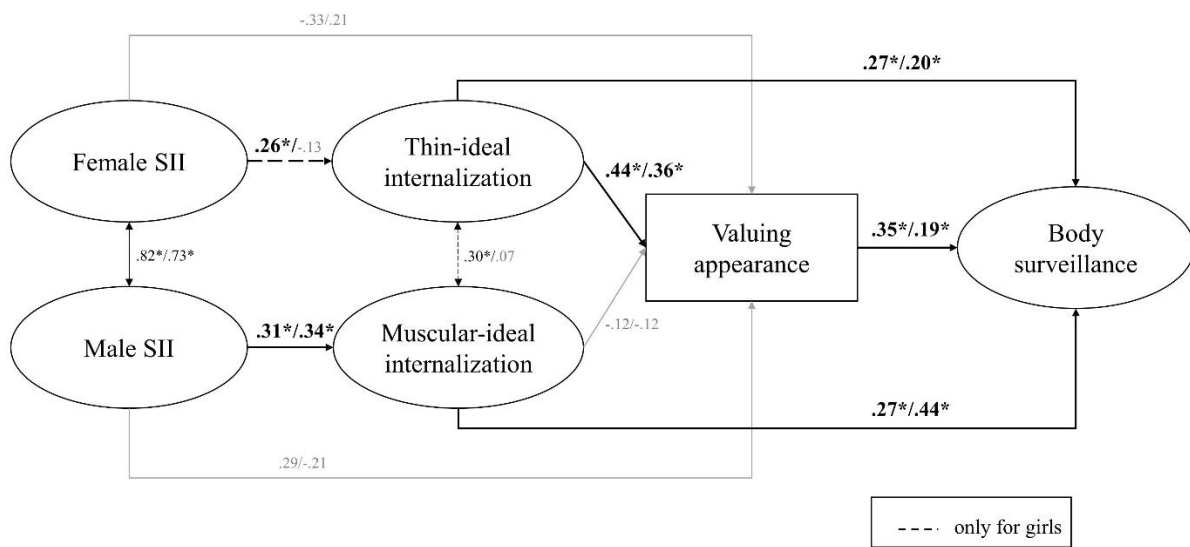


Figure 2

Final Model for the Relations between SII Use and Self-Objectification



Note: The first coefficients refer to girls, the second to boys. No coefficients are significantly different. All paths controlled for overall Instagram use and age.

* $p < .05$; Model fit: CFI = .95, RMSEA = .05.

7 Study 4: Predicting adolescents' self-objectification from sexualized video game and Instagram use: A longitudinal study⁸

Abstract

A growing body of research has demonstrated negative effects of sexualization in the media on adolescents' body image, but longitudinal studies and research including interactive and social media are scarce. The current study explored the longitudinal associations of adolescents' use of sexualized video games (SVG) and sexualized Instagram images (SII) with body image concerns. Specifically, our study examined relations between adolescents' SVG and SII use and appearance comparisons, thin- and muscular-ideal internalization, valuing appearance over competence, and body surveillance. A sample of 660 German adolescents (327 female, 333 male; $M_{\text{age}} = 15.09$ years) participated in two waves with an interval of 6 months. A structural equation model showed that SVG and SII use at Time 1 predicted body surveillance indirectly via valuing appearance over competence at Time 2. Furthermore, SVG and SII use indirectly predicted both thin- and muscular-ideal internalization through appearance comparisons at Time 1. In turn, thin-ideal internalization at Time 1 predicted body surveillance indirectly via valuing appearance over competence at Time 2. The results indicate that sexualization in video games and on Instagram can play an important role in increasing body image concerns among adolescents. We discuss the findings with respect to objectification theory and the predictive value of including appearance comparisons in models explaining the relation between sexualized media and self-objectification.

Keywords: social media; computer games; sexualization; body image; self-objectification

⁸ Skowronski, M., Busching, R., & Krahé, B. (2021). Predicting adolescents' self-objectification from sexualized video game and Instagram use: A longitudinal study. *Sex Roles, 84*, 584-598. <https://doi.org/10.1007/s11199-020-01187-1>.

Predicting Adolescents' Self-Objectification from Sexualized Video Game and Instagram Use: A Longitudinal Study⁹

There has been growing evidence that sexualization in traditional media may increase body image concerns for adults and adolescents (Ward 2016). However, media use among adolescents has profoundly changed in the past decades: Television, movies, and magazines have experienced a sharp decline, whereas video gaming and social media use are on a constant rise (Twenge et al. 2019). At the same time, longitudinal studies on the topic are rare (Vandenbosch and Eggermont 2015, 2016), with only few longitudinal studies including Instagram use and no known longitudinal studies including video games. In the current study, we seek to explore the longitudinal associations of sexualization in these media types with male and female adolescents' body image concerns.

Sexualization in Video Games and Instagram

As defined by the American Psychological Association (APA), sexualization occurs when a person's value comes only from his or her sexual appeal while ignoring their personalities, when a person is treated as a sexual object, when sexuality is inappropriately imposed (e.g., in the case of children), and/or when a person's physical attractiveness is equated with his or her sexiness (APA Task Force on the Sexualization of Girls 2007). Sexualization is common in media popular among teenagers. In top-selling video games, characters are frequently depicted with sexually revealing clothing or partially nude (Downs and Smith 2010). Both male and female characters often feature unrealistic body proportions (Dill and Thill 2007; Lynch et al. 2016). These findings particularly pertain to female characters who are more likely than male avatars to appear sexualized (Downs and Smith 2010). Various content analyses have further documented frequent sexualization on social media (Carrotte et al. 2017; Davis 2018; Tiggemann and Zaccardo 2018). Many of the most popular influencers of 2019 are models, fitness coaches, bodybuilders, and fashion and beauty bloggers (Hopper 2019) who are likely to post sexualized images of their bodies (Liu and Suh 2017). Moreover, popular Instagram trends like "fitspiration" feature images that usually contain sexualized elements, like scantily-clad people with a heavy emphasis on appearance ideals (Ghaznavi and Taylor 2015; Tiggemann and Zaccardo 2018). As in video games, women are more likely than men to be

⁹ The format of this article differs from the other articles of this dissertation. This includes in-text citations, the reference list and the figure captions (in-text: no comma after the authors, reference list and figure captions: APA-Style of the 6th edition) due to the guidelines of the journal *Sex Roles* at the time of the publication.

depicted in a sexualized manner within fitspiration imagery (Carrotte et al. 2017), yet both women and men are frequently depicted wearing revealing outfits or no clothing at all (Deighton-Smith and Bell 2018).

In Germany, 64% of teenagers report using Instagram, which scores as the second most popular social medium after WhatsApp (Medienpädagogischer Forschungsverbund Südwest 2019). With adolescents spending almost 3 h per day on social media (DAK-Gesundheit 2017), they are likely to be exposed to a high number of images on a regular basis. In addition, 87% of teenagers report playing video games, with young women spending over 5 h and young men over 13 h per week gaming (Medienpädagogischer Forschungsverbund Südwest 2019). Taken together, these numbers draw a clear picture: The level of sexualized content is high on Instagram and in video games, and they are among the most popular media formats for current youth. Studies suggest that sexualization can have a negative impact on body image (Ward 2016). Given that adolescence is a particularly vulnerable phase for appearance-related social pressure (Helfert and Warschburger 2013), more research on the potentially adverse effects of sexualization in media popular among teenagers is needed.

Objectification theory (Fredrickson and Roberts 1997) proposes an explanation on how sexualization in the media might affect body image concerns. Following Fredrickson and Roberts (1997), women in Western societies learn from an early age that their body is looked at and evaluated by others (objectification). As a result, women are socialized to take an observers' perspective on themselves, valuing their body for its appearance and correspondence with society's current appearance ideal. This process is called *self-objectification*. There have been different approaches to operationalizing the construct of self-objectification because researchers understand it as a multidimensional concept (Moradi 2011). At the cognitive level, it is manifested by women's tendency to value appearance over competence (further referred to as valuing appearance); at the behavioral level, it is shown through persistent body surveillance (Calogero 2011). Both valuing appearance and body surveillance have been linked to a wide range of negative outcomes for women, such as eating disorders and depression (Peat and Muehlenkamp 2011; Tiggemann and Williams 2011). Although not explicitly designed as a media theory, self-objectification theory proposes that sexualization in the media constitutes one form of objectification and contributes to the development of self-objectification (Fredrickson and Roberts 1997). In line with this reasoning, correlational research has found links between the use of sexualized media and self-objectification (Aubrey 2006; Morry and Staska 2001; Vandebosch and Eggermont 2012). Experimental studies demonstrated that the

exposure to sexualized media heightens self-objectification momentarily, drawing individuals' attention to their body in the respective situation (Karsay et al. 2017; Ward 2016).

Objectification theory was originally designed to describe the experiences of women in a culture that objectifies the female body. However, there is increasing evidence that the theory might also apply to men: Although men tend to have lower levels of self-objectification, data suggests that the underlying relations and patterns between media use and self-objectification are similar (Moradi and Huang 2008; Vandebosch and Eggermont 2015). Still, research is needed to examine similarities and differences between genders (Ward 2016). Furthermore, studies are missing that examine whether and how the use of new and currently popular media formats, like Instagram and video games, are linked to self-objectification.

Sexualized Media Use and Self-Objectification

Evidence on links between video game use and self-objectification is scarce, especially with adolescent samples. Vandebosch et al. (2017) let adolescents play a video game with a sexualized or a non-sexualized character and found that playing with a sexualized avatar increased valuing appearance. Two more experiments supported this assumption (Fox et al. 2015), whereas a null effect was found by Read et al. (2018). To our knowledge, no single cross-sectional or longitudinal study on sexualized media and self-objectification included video games in the design. Harrison and Bond (2007) measured male adolescents' consumption of gaming magazines and found that it predicted their drive for muscularity, a concept linked to self-objectification (Martins et al. 2007), measured 1 year later. Although Harrison and Bond did not measure actual video game use, this finding might be the result of their participants' exposure to video game characters in the magazines, which often emphasize the avatars' bodies and their sexual appeal (Dill and Thill 2007). The authors found this relation only for White, but not for Black adolescents, which could be explained by the lack of Black video game characters and therefore less identification possibilities for Black young men (Harrison and Bond 2007). Clearly, studies are missing that measure male and female adolescents' actual video game use and its associations with body image concerns in a longitudinal design to draw conclusions about the long-term outcomes of sexualized gameplay. To address this lacuna, the current two-wave study seeks to investigate whether sexualized video game (SVG) use leads to higher self-objectification.

Concerning social media use, research using the framework of objectification theory to connect it to body image concerns has increased greatly in the past decade (Holland and Tiggemann 2016). Many correlational studies demonstrated that higher Instagram use is linked

with higher valuing appearance and body surveillance in women (Cohen et al. 2017; Fardouly et al. 2017; Feltman and Szymanski 2018; Saiphoo and Vahedi 2019). This correlational evidence is complemented by some experimental studies: Tiggemann and Zaccardo (2015) showed that after viewing fitspiration images compared with travel images, women scored higher on body dissatisfaction, a concept positively linked to self-objectification (Tiggemann and Lynch 2001). In another experiment, female undergraduates reported greater body dissatisfaction after viewing thin- and athletic-ideal, but not muscular-ideal fitspiration images (Robinson et al. 2017). Research including men is largely missing. However, some longitudinal research has investigated the long-term associations of social media use with self-objectification for male and female adolescents: Sevic et al. (2019) studied social networking use and body image of male adolescents over 22 months and found no evidence of longitudinal relationships between social-media use and body surveillance. In another study by Vries et al. (2016), social-networking use predicted adolescents' body dissatisfaction 18 months later. Also, Wang et al. (2019) found that selfie-viewing predicted increased valuing appearance among adolescents 6 months later. However, all of these studies measured general social-networking use or selfie-viewing and did not specifically focus on sexualization. Only Vandebosch and Eggermont (2016) used the extent of monitoring attractive peers on social media as a measure of sexualized social-networking use and found that it predicted valuing appearance and body surveillance among female and male teenagers 6 months later. However, studies are missing that measure adolescents' habitual consumption of sexualized Instagram images (SII) and its relation to self-objectification.

To sum up, there is only limited longitudinal research on media use and self-objectification (Aubrey 2006; Sevic et al. 2019; Vandebosch and Eggermont 2015, 2016; Wang et al. 2019), with no more than two known studies including social media and no known study including video games. This is unfortunate because levels of sexualization are high on both media formats (Carrotte et al. 2017; Downs and Smith 2010), and they are among the most important media formats for current youth (Medienpädagogischer Forschungsverbund Südwest 2019). Moreover, video games and Instagram differ from traditional media by their interactive design, but the impact of interactivity remains unclear on the basis of past research. It has been argued that interactivity may create greater effects via a stronger feeling of presence (Karsay et al. 2017), but other research suggests that interactivity may diminish negative effects when cognitive load in video games is high (Read et al. 2018). Therefore, research on long-term relations of the use of sexualized video games and Instagram images with self-objectification is clearly warranted.

Mediating Processes

Fredrickson and Roberts (1997) argue that repeated exposure to objectification, as in sexualized media, gradually socializes women to self-objectify. It is likely that several mediating processes are involved in this process (Aubrey 2007). Two prominent variables are the internalization of appearance ideals and appearance comparisons, in general or with peers in particular (Fardouly et al. 2015), which are both argued to heighten self-objectification (Ward 2016). A prominent model featuring appearance-ideal internalization is the three-step model of self-objectification by Vandenberg and Eggermont (2015). Following these researchers, sexualized media is proposed to increase valuing appearance directly and indirectly via appearance-ideal internalization. Both of these pathways then increase body surveillance as the third step. This model has been tested with adolescents' traditional media use and general Facebook use. However, studies are missing that apply the theory to the new media formats of Instagram and video games.

Concerning Instagram use, some cross-sectional evidence shows that Instagram use predicts self-objectification via appearance-ideal internalization and appearance-comparison tendencies in women (Fardouly et al. 2017; Feltman and Szymanski 2018). One cross-sectional study with men found that consuming fitspiration imagery on Instagram predicted body dissatisfaction through both muscular-ideal internalization and appearance comparisons (Fatt et al. 2019). These results suggest that both variables play a role in explaining the associations of sexualized media with self-objectification. Yet within the framework of objectification theory and the three-step model of self-objectification, no known study has included both mediators in longitudinal research on the role of sexualized Instagram and video game use. Hence, it is unclear if and how these variables mediate the relation between media and self-objectification.

Theoretical considerations may be derived from sociocultural theory (Thompson et al. 1999), which postulates that media use is one of three sociocultural predictors (in addition to peers and parents) of body image concerns. The model posits that appearance comparisons and appearance-ideal internalization are mediators of this relation, which has been supported by extensive research (Shroff and Thompson 2006; van den Berg et al. 2002). Furthermore, researchers investigating the theory found evidence for a direct path from appearance comparisons to appearance-ideal internalization (Keery et al. 2004; Shroff and Thompson 2006). To our knowledge, no study so far has integrated this theoretical perspective into the three-step model of self-objectification. Applying these considerations to the framework of objectification theory, we expected sexualized media to increase appearance-ideal

internalization directly and indirectly via appearance comparisons. Appearance-ideal internalization should then increase self-objectification.

The Current Study

We aimed to contribute to research on objectification theory in several ways. First, the three-step model of self-objectification (Vandenbosch and Eggermont 2015) is a prominent model to describe the associations of sexualized media use with body image concerns, but it needs further testing (Ward 2016). Although many studies have demonstrated links between sexualized media use and individual variables of the three-step model, few researchers have included all variables in their analyses. Second, although appearance comparisons are discussed as a further mediator in this process (Ward 2016), research integrating this variable in the process of self-objectification is limited. With the current study, we aimed to address this gap by including appearance comparisons, appearance-ideal internalization, valuing appearance, body surveillance, and sexualized media use in a longitudinal design.

Third, scholars have called for more research on media use and objectification theory among males (Ward 2016), which we addressed in this study by including both male and female adolescents. Western societies define a thin body as ideal for women and a muscular body as ideal for men (Moradi 2010). However, both concepts are linked because muscular bodies are usually slender bodies as well (Schaefer et al. 2017). Furthermore, the current female ideal features both thinness and muscularity (Bozsik et al. 2018; Tiggemann and Zaccardo 2018). Based on this evidence, both appearance ideals should be relevant for male and female adolescents. We therefore included two facets of appearance-ideal internalization in our model: thin-ideal and muscular-ideal internalization. Because scholars have called for a more thorough examination of the concept of internalization (Karsay et al. 2017), this represents another aim of our study. Following the rationale of the three-step model of self-objectification (Vandenbosch and Eggermont 2015), sexualized media use should trigger valuing appearance over time, a claim that has been supported by several longitudinal studies including magazines, television, and specific social media behavior (Aubrey 2006; Vandenbosch and Eggermont 2015, 2016; Wang et al. 2019), but not with respect to the exposure to sexualized images on Instagram or video games. Filling this research gap by measuring adolescents' sexualized Instagram and video game consumption over time was another goal of our study.

The following propositions were examined on our study: First, we postulated that higher levels of sexualized video game (SVG) and sexualized Instagram images (SII) use at Time 1 would predict greater valuing appearance at Time 2 (Hypothesis 1). Second, we expected SVG

and SII use to predict greater appearance comparisons (Hypothesis 2). Third, we expected greater SVG and SII use to predict higher thin-ideal internalization, and muscular ideal internalization (Hypothesis 3). Fourth, we expected greater appearance comparisons to predict higher thin-ideal and muscular-ideal internalization (Hypothesis 4). Because we only had two data waves, the associations predicted in Hypotheses 2 to 4 had to be modelled cross-sectionally at Time 1.

Building on the rationale of the three-step model of self-objectification, we assumed that thin-ideal and muscular-ideal internalization at Time 1 would predict higher valuing appearance and body surveillance at Time 2 (Hypothesis 5). In line with Vandenberg and Eggermont (2015), we further expected a direct path from valuing appearance to body surveillance (Hypothesis 6). Again, due to the two-wave design of our study, this association had to be modelled cross-sectionally at Time 2. Furthermore, we assumed SVG and SII use at Time 1 to be indirectly linked to body surveillance at Time 2 via appearance comparisons at Time 1, thin-ideal internalization at Time 1, and valuing appearance at Time 2 (Hypothesis 7). We expected the same indirect path with muscular- as for thin-ideal internalization at Time 1. Furthermore, we assumed indirect paths from SVG and SII use at Time 1 to body surveillance via valuing appearance at Time 2 (Hypothesis 8). Finally, we proposed indirect paths from SVG and SII use at Time 1 to body surveillance and valuing appearance at Time 2 via thin-ideal or muscular-ideal internalization at Time 1 (Hypothesis 9). Our proposed model reflecting these hypotheses is displayed in Figure 1.

As control variables, we included age and body-mass index (BMI) because higher scores on these variables have been linked to differences in the variables of the self-objectification process (Tiggemann and Lynch 2001). Furthermore, there are several indications that objectification theory is generally applicable to males, but that gender-specific associations might exist (Moradi and Huang 2008). For example, muscular-ideal internalization might have a stronger influence on men than on women (Moradi 2010). Accordingly, we explored the possible moderating role of gender.

Method

Participants

The sample consisted of 660 students (327 female and 333 male adolescents) from five secondary schools in different parts of Germany. The data were collected in two waves with an interval of 6 months. Of the 625 participants at Time 1 (316 female and 307 male), 544 took part at Time 2 (274 female and 270 male), resulting in a dropout rate of 12.96%. Thirty-five

participants (5.30% of the whole sample) were absent at Time 1 and took part only at Time 2. All 660 participants who participated in at least one data wave were included in the analyses, and missing data were handled using full-information maximum likelihood (FIML) estimation (see the following Analysis Plan section). The mean age of the sample was 15.09 years ($SD = 1.26$, range = 13–19) at Time 1 and 15.53 years ($SD = 1.29$, range = 13–19) at Time 2. The majority of participants (601, 91.1%) were German nationals.

Procedure

Approval of the study was obtained by the Ethics Committee of the authors' university. The measures were administered by the first author during normal class hours. Informed consent was obtained from the participants themselves in line with the regulations for school-based research in the respective school administrations. Participants were told that the topic of the study was "Media use and self-perceptions." After providing informed consent, participants filled out the measures of body image concerns first and measures of media use second. At each data wave, participants could take part in a raffle of gift cards worth 10 or 25 Euros as a reward for participation. To ensure anonymity, participants created a personal code which was used to match the data for both time points. After the completion of the study at Time 2, the researcher debriefed all participants during the rest of the class hour and answered questions about the study. Additionally, all participants were given a debriefing letter that contained contact data in case they had further questions.

Measures

Use of Sexualized Video Games (SVG Use)

SVG use was measured at Time 1. Participants were asked to list their two favorite video games that they had enjoyed playing most in the past 6 months. For each game, participants were asked to make two ratings: how sexualized (a) the female characters and (b) the male characters were on a scale from 1 (*not at all*) to 4 (*very much*). Examples were given for the meaning of sexualization for female and male characters each (e.g., scantily dressed for both, big breasts for females, muscularity for males). Participants were instructed to indicate "1" if there were no human-like female or male characters present in the game. The mean rating of the four items served as a measure of SVG use, with higher ratings indicating higher SVG use. The internal consistency was acceptable (Cronbach's $\alpha = .65$) bearing in mind the low number of items (Cortina 1993). The listing of favorite video games with content ratings by participants is widely used in the field of violent video game research as a reliable and valid method (Busching et al. 2015).

Use of Sexualized Instagram Images (SII Use)

SII use was also measured at Time 1. Participants were shown three pictures of sexualized women and three pictures of sexualized men taken from public Instagram profiles. The pictures showed young adults in various forms of scant clothing and body-emphasizing poses. For each male and female set, one picture reflected photos that are common among everyday users of Instagram (e.g., poses in front of a mirror/at the beach), one picture reflected sexualization in the context of fitness accounts, and one picture showed a person in an erotic pose, as commonly used for advertisements. Pictures are available from the first author upon request. For each picture, participants were asked to rate how often they had seen similar pictures on Instagram on a 5-point scale from 1 (*never*) to 5 (*very often*). Scores were averaged across items, with higher scores indicating higher SII use. Participants were told that they should not focus on the specific persons but the way in which they were presented (e.g., clothing, pose). Internal consistency was high (Cronbach's $\alpha = .93$).

Appearance Comparisons

The Physical Appearance Comparison Scale (Thompson et al. 1991) was used at Time 1 to assess participants' tendency to compare their appearance with the appearance of others in social situations. The scale consisted of five items (e.g., "In social situations, I sometimes compare my figure to the figures of other people") rated on a 5-point scale from 1 (*never*) to 5 (*always*). Scores were averaged across items such that a higher overall score indicated a stronger tendency to engage in appearance comparisons. Internal consistency for the scale was good (Cronbach's $\alpha = .83$).

Thin-Ideal Internalization

Thin-ideal internalization was measured at Time 1 with the Thin/Low Body Fat subscale of the Sociocultural Attitudes towards Appearance Questionnaire-4R (SATAQ-4R; Schaefer et al. 2017). The scale consists of three items (e.g., "I want my body to be very thin"), and participants rated the extent to which they strive toward appearance ideals on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The mean rating of all items determined the participants' thin-ideal internalization score, with higher scores indicating higher levels of thin-ideal internalization. Internal consistency was good (Cronbach's $\alpha = .82$).

Muscular-Ideal Internalization

The Muscular/Athletic subscale of the SATAQ-4R was used at Time 1 (Schaefer et al. 2017). It consists of four items (e.g., "It is important for me to look muscular"). Participants rated the extent to which they strive toward the muscular ideal on a scale from 1 (*strongly*

disagree) to 5 (*strongly agree*). The mean rating across all items yielded the participants' muscular-ideal internalization score, with higher scores indicating higher levels of muscular-ideal internalization. The scale had excellent internal consistency (Cronbach's $\alpha = .94$).

Valuing Appearance over Competence

Valuing appearance was assessed by the Self-Objectification Questionnaire (Noll and Fredrickson 1998) at Time 1 and Time 2. Participants were asked to rank 10 body attributes from 0 (*least important*) to 9 (*most important*) for their individual bodily self-concept. Five of the attributes are appearance-based (e.g., weight, sex appeal) and five are competency-based (e.g. health, stamina). The difference between the sum of the ranks of the appearance-based attributes and the sum of the ranks of the competency-based attributes determined the participant's score of valuing appearance, with higher scores indicating higher levels of valuing appearance. The maximum score for the appearance-based attributed was 35, the minimum score of the competency-based attributes was 10 and vice versa, yielding a theoretical range of -25 to 25 on this measure. Due to its rank-order format, internal consistency could not be calculated for this measure. The measure has been shown to have good construct validity (Noll and Fredrickson 1998).

Body Surveillance

A shortened version of the Surveillance subscale of the Objectified Body Consciousness Scale was used at Time 1 and Time 2 (Knauss et al. 2008; McKinley and Hyde 1996). The scale consisted of seven items (e.g., "During the day, I think about how I look many times"), rated on a scale from 1 (*strongly disagree*) to 4 (*strongly agree*). Scores were averaged across items such that higher ratings indicated higher levels of body surveillance. Internal consistency was good at both data waves (Time 1: Cronbach's $\alpha = .81$, Time 2: Cronbach's $\alpha = .82$).

Control Variables

At Time 1, participants indicated their age as well as their weight and height, which was used to calculate their BMI.

Analysis Plan

Analyses of measurement invariance (MI) and the test of the hypothesized model were carried out using Mplus 8.4. The hypothesized model was tested using multigroup structural equation modelling. For appearance comparisons and thin-ideal and muscular-ideal internalization, the respective items were used as indicators for the latent variables. Due to its rank-order format, valuing appearance was included as a manifest variable in the model. Concerning SVG use, mean scores of the four items of the sexualized video game characters

were used as to create a single-indicator latent variable. This was done because ratings of female and male characters in the same game were highly correlated ($r_s \geq .58$) and thus led to the model being non-identified. Concerning SII use, the ratings of the six sexualized female and male images were used as indicators for the latent variable. We used three item parcels as indicators for the body surveillance scale. When a scale measures a unidimensional construct, which is the case in our model, parceling enhances scale communality and modelling efficiency (Little et al. 2013). As recommended by Little et al. (2013), we used correlational parceling.

Before the hypothesized model was tested, measurement invariance for group comparisons between male and female participants was tested with Mplus 8.4 (Hussey and Hughes 2020). This pretesting was done for all variables except SVG use and valuing appearance, for which MI was not applicable because they are single-indicator or manifest variables. If MI holds, then male and female participants may be assumed to have interpreted the items and underlying latent factors in the same way (van de Schoot et al. 2012). Configural, metric, intercept-only, and scalar invariance models were tested using the robust maximum likelihood (MLR) estimator (van de Schoot et al. 2012). To determine differences between the models, we used the Bayes Information Criterion (BIC), because some of the models were nonhierarchical. The smallest BIC value represents the best fitting model (Raftery 1995). If full metric invariance was not given, some of the parameters were allowed to vary across groups to establish partial metric MI (Vandenberg and Lance 2000). We further tested MI across the data waves for body surveillance. MI across time was not tested for valuing appearance because it is a manifest variable. We specified a model that constrained the factor loadings on body surveillance to be equal across time and used BIC to compare this model to a baseline model in which factor loadings were allowed to differ.

In our proposed model, we controlled for the Time 1 values of age and BMI by including these variables as predictors for all endogenous variables. Furthermore, the Time 2 variables were controlled for their baseline value by including their respective Time 1 value as a predictor of the Time 2 value. Indirect paths were tested using the Mplus MODEL INDIRECT option. To test the significance of the direct and indirect paths, we calculated 95% and 99% confidence intervals through 10,000 bias-corrected bootstrap replications. Because bootstrapping is not available using MLR estimation, the maximum likelihood (ML) estimator was used for these analyses. However, bootstrapping as a nonparametric approach does not rely on assumptions of normality. The bootstrapping approach has been shown superior to all other procedures for testing indirect paths (Hayes and Scharkow 2013).

Missing Data

All participants who took part in at least one of the two data waves were included in the analyses. Missing data were handled using the FIML estimator of Mplus. This method has been shown to be superior to traditional missing data methods, yielding unbiased and more efficient estimates and standard errors (Enders and Bandalos 2001; Schlomer et al. 2010).

Model Fit

Because the Chi-square test is sensitive to sample size and degrees of freedom, even minor differences between the observed and estimated covariance matrices result in model rejection (Hair et al. 2019). Therefore, we report the Chi-square tests for completeness, but used the comparative fit index (CFI), the root-mean square error of approximation (RMSEA) and the standardized root mean residual (SRMR) to evaluate model fit. CFI values higher than .95, RMSEA values lower than .05, and SRMR values lower than .08 indicate acceptable model fit (Hu and Bentler 1998; Schermelleh-Engel et al. 2003).

Results

Measurement Invariance, Descriptive Statistics, and Correlations

We tested MI across gender. Metric invariance was established for all variables except SII use. For SII use, we could establish partial MI, with three items having stronger loadings on the latent factor for the female compared to the male participants. We also tested MI across time for body surveillance. The assumption of weak measurement invariance was tenable, and factor loadings were comparable across time. (The fit indices and model comparisons are presented in the online supplement, Table 1s¹⁰.) Table 1 presents the descriptive statistics and range for all study variables. We calculated differences between male and female adolescents with SPSS 26, using *t*-tests instead of multivariate analysis of variance, which uses listwise deletion. An alpha level of $p < .006$ (.05/9) was used to correct for multiple comparisons. The test statistics for gender differences can be found in Table 1. Significant gender differences were found for SII use, with female adolescents reporting higher consumption compared with males. Furthermore, female adolescents scored higher than did males on appearance comparisons, thin-ideal internalization, valuing appearance, and body surveillance. Male participants reported higher muscular-ideal internalization than did female. No gender difference was found concerning SVG use.

¹⁰ The supplementary material of this study can be found online via the respective article.

Table 2 shows the zero-order correlations between all variables in the model, separately for male and female participants. SII use and body image concern variables were significantly correlated for both young men and women (except for thin-ideal internalization, which was uncorrelated with SII use for male adolescents). SVG use was correlated with appearance comparisons, valuing appearance, and body surveillance for male adolescents. For female adolescents, SVG use was significantly correlated with body surveillance at Time 1.

Hypothesis Testing

In a first step, we examined if gender was a moderator of the proposed associations. Therefore, we first conducted a multigroup analysis for male and female adolescents in which the paths were constrained to be equal for both gender groups. This model yielded a good fit, $\chi^2(694, n = 660) = 1152.424, p < .001$ (CFI = .951, RMSEA = .045, 90% CI [.040, .049], SRMR = .066). In a next step, we estimated a model in which the paths were allowed to vary between male and female adolescents. Again, the model fit was good, $\chi^2(661, n = 660) = 1101.723, p < .001$ (CFI = .953, RMSEA = .045, 90% CI [.040, .050], SRMR = .056). Finally, we compared both models, using the BIC as the comparison criterion. The constrained model (BIC = 48,195.92) had a smaller BIC value than the unconstrained model (BIC = 48,359.46; Δ BIC = -163.54), indicating better fit for the constrained model. This means that gender did not moderate the hypothesized relations. Despite this result, we could not employ single-group modelling but adopted the constrained multiple group model as the final model because we only had partial MI for SII use, with three items having stronger loadings on the latent factor for female than for male adolescents. Figure 2 depicts the standardized path coefficients of the final model, with a fit of $\chi^2(694, n = 660) = 1152.424, p < .001$ (CFI = .951, RMSEA = .045, 90% CI [.040, .049], SRMR = .066). (The Mplus code and output is provided in Online Resource 2 in the online supplement.)

Hypothesis 1, which predicted that higher levels of SVG ($b = 3.31, \beta = .17, 99\% \text{ CI } [.06, 6.64]$) and SII ($b = 1.15, \beta = .11, 99\% \text{ CI } [.09, 2.25]$) use at Time 1 would be linked to greater valuing appearance at Time 2, was supported. The prediction in Hypothesis 2 that SVG ($b = .41, \beta = .20, 95\% \text{ CI } [.04, .75]$) and SII ($b = .26, \beta = .25, 99\% \text{ CI } [.11, .41]$) use would be associated with greater appearance comparisons was also confirmed. Hypothesis 3 stated that SVG and SII use would predict higher muscular-ideal and thin-ideal internalization. Partly consistent with this hypothesis, SII use ($b = .19, \beta = .19, 99\% \text{ CI } [.06, .32]$) was significantly associated with muscular-ideal internalization whereas SVG use ($b = -.04, \beta = -.02, 95\% \text{ CI } [-.36, .31]$) was not. Neither SVG ($b = .08, \beta = .04, 95\% \text{ CI } [-.27, .44]$) nor SII use ($b = -.05, \beta = -.05, 95\% \text{ CI } [-.16, .07]$) was linked to thin-ideal internalization, again not supporting Hypothesis 3.

Hypothesis 4, which predicted higher appearance comparisons to be associated with greater thin-ideal internalization ($b = .36, \beta = .36, 99\% \text{ CI } [.20, .53]$) and muscular-ideal internalization ($b = .24, \beta = .24, 99\% \text{ CI } [.11, .38]$), was confirmed. In Hypothesis 5, we assumed higher thin-ideal and muscular-ideal internalization at Time 1 would predict greater valuing appearance and body surveillance at Time 2. Consistent with this hypothesis, thin-ideal internalization at Time 1 predicted valuing appearance at Time 2 ($b = .92, \beta = .10, 95\% \text{ CI } [.08, 1.76]$), but we did not find this path for muscular-ideal internalization ($b = -.14, \beta = -.01, 95\% \text{ CI } [-.89, .65]$). In addition, the proposed paths from thin- ($b = -.14, \beta = -.08, 95\% \text{ CI } [-.32, .03]$) and muscular-ideal internalization ($b = -.04, \beta = -.02, 95\% \text{ CI } [-.18, 1.00]$) at Time 1 to body surveillance at Time 2 were not significant. Hypothesis 6, which stated that valuing appearance predicted body surveillance was confirmed ($b = .02, \beta = .13, 99\% \text{ CI } [.004, .04]$).

The tests of the hypothesized indirect paths are presented in Table 3. A table displaying all indirect paths is presented in the online supplement, Table 2s. In Hypothesis 7, we expected SVG and SII use at Time 1 to be indirectly linked to body surveillance at Time 2 via appearance comparisons at Time 1, thin-ideal internalization at Time 1, and valuing appearance at Time 2. The indirect path was statistically significant for SVG use ($b = .01, \beta = .001, 99\% \text{ CI } [.003, .01]$). However, for SII use, the indirect path was not statistically significant ($b = .002, \beta = .001, 99\% \text{ CI } [.00, .01]$). We expected the same indirect paths with muscular-ideal internalization at Time 1, but they were not significant (SVG: $b = .00, \beta = .00, 95\% \text{ CI } [-.004, .001]$; SSI: $b = .00, \beta = .00, 95\% \text{ CI } [-.002, .001]$), because muscular-ideal internalization at Time 1 did not predict either valuing appearance or body surveillance at Time 2. Thus, Hypothesis 7 was partly supported for thin-ideal, but not for muscular-ideal internalization.

For Hypothesis 8, we expected an indirect path from SVG and SII use at Time 1 to body surveillance at Time 2 via valuing appearance at Time 2. This hypothesis was confirmed (SVG: $b = .08, \beta = .02, 99\% \text{ CI } [.02, .05]$; SII: $b = .03, \beta = .02, 99\% \text{ CI } [.003, .08]$). In Hypothesis 9, we proposed indirect links from SVG and SII use at Time 1 to valuing appearance and body surveillance at Time 2 via thin-ideal or muscular-ideal internalization. These indirect paths were nonsignificant, not confirming Hypothesis 9 (for SVG use \rightarrow thin-ideal: $b = .002, \beta = .00, 95\% \text{ CI } [-.01, .02]$ and SVG use \rightarrow muscular-ideal: $b = .00, \beta = .00, 95\% \text{ CI } [-.002, .01]$; for SII use \rightarrow thin-ideal: $b = -.001, \beta = -.001, 95\% \text{ CI } [-.01, .001]$ and SII muscular \rightarrow thin-ideal: $b = -.001, \beta = -.001, 95\% \text{ CI } [-.01, .003]$).

We conducted a sensitivity analysis to examine the influence of the covariates age and BMI on our model by specifying a model without controlling for these covariates. Apart from

slightly different standardized coefficients, the results did not change, and the pattern of associations remained the same.

Discussion

The present study integrated theoretical considerations from objectification theory (Fredrickson and Roberts 1997) and sociocultural theory (Thompson et al. 1999) by demonstrating longitudinal associations between sexualized media use and adolescents' body image concerns. Specifically, our results show that sexualized video game (SVG) and sexualized Instagram images (SII) use indirectly increased body surveillance over time via several mediators: In the case of SVG use, via appearance comparisons, thin-ideal internalization, and valuing appearance, in the case of SII use, via valuing appearance.

We had several goals with the present study. First, we aimed to extend previous findings that sexualized media increase self-objectification over time, using valuing appearance and body surveillance as two components of self-objectification and including Instagram and video games as media that are currently popular among youth. Consistent with our predictions and previous research concerning other media formats (Aubrey 2006; Vandebosch and Eggermont 2015; Wang et al. 2019), adolescents' higher SVG and SII use at Time 1 predicted higher scores of valuing appearance at Time 2. We also found that greater valuing of appearance predicted heightened body surveillance at Time 2. The indirect path from SVG and SII use at Time 1 to body surveillance via valuing appearance at Time 2 was also significant. These results suggest that exposure to sexualized content on Instagram and in video games may negatively affect adolescents' body image. Our study is, to our knowledge, the first to examine longitudinal associations between sexualized images on Instagram, sexualization in video games, and different facets of self-objectification in male and female adolescents.

A second goal of our study was to shed light on processes mediating the path from sexualized media use to self-objectification. Appearance-ideal internalization and appearance comparisons have been discussed as mediators (Ward 2016), but to our knowledge, our study is the first to integrate both variables within a longitudinal model. In Vandebosch and Eggermont's (2015) three-step model, sexualized media use predicts appearance-ideal internalization, which in turn predicted increased valuing appearance and body surveillance. However, the role of internalization is yet unclear because there are inconsistencies in the literature so that researchers have recommended a more thorough exploration of the concept (Karsay et al. 2017). For this reason and to reflect possible gendered manifestations of internalization, we included two separate measures of thin-ideal internalization and muscular-

ideal internalization, respectively. Contrary to our expectations, which were derived from objectification theory and previous findings (Fardouly et al. 2017; Fredrickson and Roberts 1997; Vandebosch and Eggermont 2015), we did not find associations of SVG and SII use with thin-ideal internalization at Time 1 in our model, nor did we find the proposed association of SVG use with muscular-ideal internalization at Time 1. Only the hypothesized association of SII use with muscular-ideal internalization at Time 1 was significant. Furthermore, we did not find the proposed paths from thin- and muscular-ideal internalization at Time 1 to body surveillance at Time 2. In line with our hypothesis, we found that higher thin-ideal internalization at Time 1 predicted higher valuing appearance at Time 2, but Time 1 muscular-ideal internalization did not. As a consequence, the hypothesized indirect paths from Time 1 sexualized media to Time 2 body surveillance via Time 1 thin-ideal or muscular-ideal internalization and Time 2 valuing appearance were also not significant.

In summary, neither thin-ideal nor muscular-ideal internalization mediated between sexualized media use and self-objectification, which is in apparent contradiction to previous research. However, there are several explanations for these results that might offer new insights into the concept of appearance-ideal internalization. Previous studies showing a mediating role of appearance-ideal internalization between sexualized media and self-objectification used the third version of the Sociocultural Attitudes towards Appearance Questionnaire (Thompson et al. 2004). In this version, appearance-ideal internalization was measured with items like “I compare my body to the bodies of people who appear in magazines” or “I wish I looked like the models in music videos.”

This scale has several problems. First, it generally refers to the appearance of celebrities. Although celebrities usually represent current appearance ideals, this version does not explicitly capture the concept of thinness or muscularity. The fourth and revised version of the SATAQ used in the current study addressed this shortcoming by including subscales of thin-ideal and muscular-ideal internalization with statements like “I want my body to look very thin” or “It is important for me to look muscular” (Schaefer et al. 2017).

Second, the older version of the SATAQ does not measure internalization but rather the tendency of people to compare their appearance to others. In our model, this tendency is reflected in the variable “appearance comparisons,” and as we expected, both SVG and SII use were linked to appearance comparisons at Time 1. In turn, appearance comparisons predicted thin-ideal and muscular-ideal internalization. Consequently, we argue that our study disentangled two processes involved in earlier operationalizations of internalization: (a) the

tendency to compare one's appearance and (b) the internalized desire to have a body that looks a certain way—in our study either thin or muscular. Our data suggests that, when measured in this way, internalization might function differently from earlier operationalizations. Sexualized media might first trigger appearance comparisons that, in turn, promote the internalization of the thin ideal and the muscular ideal. Thin-ideal internalization then increases body surveillance indirectly via valuing appearance. The resulting full indirect chain from Time 1 SVG to Time 2 body surveillance via Time 1 appearance comparisons, Time 1 thin-ideal internalization, and Time 2 valuing appearance was significant, confirming our predictions. However, the same path was not significant for SII use. It might be that the indirect path is stronger for SVG use due to the higher presence of people experienced in video games. Following this rationale, the indirect SII use path might be explained by a lack of power for detecting a significant indirect path for the entire chain. Furthermore, no parallel pathway was found for muscular-ideal internalization, calling for future research to explore the role of muscular-ideal internalization.

Our findings have implications for objectification theory because they speak for the integration of appearance comparisons in the explanatory mechanism behind the associations of sexualized media with body image concerns. Highlighting further theoretical implications for objectification theory, the thin ideal seems to play a central role for the development of self-objectification, but the muscular ideal does not. However, we cannot conclude from this finding that muscular-ideal internalization is irrelevant for body image concerns because the concept is linked to body dissatisfaction and disordered eating (Fatt et al. 2019; Schaefer et al. 2017). Instead, the data offer some indication that the internalization of muscularity might either result in other forms of body image concerns or that other mediators between muscular-ideal internalization and self-objectification need to be considered.

The final goal of our study was to expand the literature on objectification theory by including male participants. In our investigation, we did not find gender to be a moderating factor of the examined associations. However, it is important to keep in mind that except for muscular-ideal internalization, female adolescents scored higher on all measures of body image concerns. Based on these data, the underlying processes are the same for male and female adolescents, but young women are still more inclined to be critical with their bodies, thus being more at risk for developing body image disturbances and eating disorders (Striegel-Moore and Bulik 2007).

Limitations and Future Research Directions

Several limitations have to be noted about the current study. First, our measure of SVG use relied on users' ratings. Because participants had to estimate the degree of sexualization of the video game characters themselves, these estimations might be biased. However, studies in the area of violent video games demonstrated that user ratings concerning video games are reliable and highly correlated with expert ratings (Busching et al. 2015). Conceptually, although perceived sexualization should be more relevant to understanding its association with users' self-objectification than "objective" sexualization, future studies should examine the extent to which users' perceptions of sexualized content overlap with the degree of sexualization established by independent raters.

Second, we measured SII use by asking participants how frequently they see sexualized images on Instagram. We did not differentiate between the types of persons depicted on these images: whether they are models, celebrities, or peers. There is mixed evidence with regard to whether peer images or celebrity images are more influential on people's body image concerns (Carey et al. 2014; Fardouly and Vartanian 2015). Hence, future studies should include measurements of comparison targets on Instagram.

A third limitation is that we collected data at only two time points, although the model we examined included five steps from media use to body surveillance. To draw definite conclusions, it would be necessary to measure the proposed sequence at five time points. Moreover, we assessed the relevant variables with an interval of 6 months, which is a relatively short period. However, we believe it to be sufficient for the relations that we examined in our study because developmental changes happen rapidly in individuals during puberty (Lerner and Steinberg 2009). It would be interesting to see in future studies whether the processes are sustained over several years instead of months. Finally, future research could investigate whether the same model holds for adult users of SVG and SII. Research is still lacking that examines the associations of sexualized media use with body image concerns among women and men beyond early adulthood (Ward 2016).

Practice Implications

Social media and video games are media formats that adolescents constantly use in their free time (Medienpädagogischer Forschungsverbund Südwest 2019). Therefore, teachers, educators, and also policymakers should be aware of the potential harmful effects of sexualization in these media. Studies suggests that media literacy programs can buffer negative effects of media ideals on female adolescents' thoughts and feelings about their bodies (McLean

et al. 2016). Such programs might be implemented at schools to educate adolescents about how sexualized images may contribute to the development of a negative body image. Counselors and educators might also advise adolescents to follow Instagram channels creating body-positive content because initial evidence indicates that body-positive messages improve body image (Cohen et al. 2019). Furthermore, video game developers should be conscious of their responsibility for adolescents' well-being and should create characters in a non-sexualized way.

Conclusion

The results of our longitudinal study add to the growing body of research demonstrating longitudinal associations of sexualization in the media with adolescents' body image concerns. Our study extends and supports objectification theory by highlighting the role of interactive media like Instagram and video games in this regard and by highlighting appearance comparisons as a meaningful part of the development of adolescents' self-objectification. For future research in this area, we suggest the investigation of possible mediators between muscular-ideal internalization and self-objectification and a more thorough examination of comparison targets on Instagram.

References

- APA Task Force on the Sexualization of Girls. (2007). *Report of the APA task force on the sexualization of girls*. Washington, DC. Retrieved from <http://www.apa.org/pi/women/programs/girls/report-full.pdf>
- Aubrey, J. S. (2006). Effects of sexually objectifying media on self-objectification and body surveillance in undergraduates: Results of a 2-year panel study. *Journal of Communication, 56*, 366–386. doi:10.1111/j.1460-2466.2006.00024.x
- Aubrey, J. S. (2007). The impact of sexually objectifying media exposure on negative body emotions and sexual self-perceptions: Investigating the mediating role of body self-consciousness. *Mass Communication and Society, 10*, 1–23. doi:10.1080/15205430709337002
- Bozsik, F., Whisenhunt, B. L., Hudson, D. L., Bennett, B., & Lundgren, J. D. (2018). Thin is in? Think again: The rising importance of muscularity in the thin ideal female body. *Sex Roles, 79*, 609–615. doi:10.1007/s11199-017-0886-0
- Busching, R., Gentile, D. A., Krahe, B., Möller, I., Khoo, A., Walsh, D. A., & Anderson, C. A. (2015). Testing the reliability and validity of different measures of violent video game use in the United States, Singapore, and Germany. *Psychology of Popular Media Culture, 4*, 97–111. doi:10.1037/ppm0000004
- Calogero, R. M. (2011). Operationalizing self-objectification: Assessment and related methodological issues. In R. M. Calogero, S. Tantleff-Dunn, & J. K. Thompson (Eds.), *Self-objectification in women: Causes, consequences, and counteractions* (pp. 23–49). Washington: American Psychological Association.
- Carey, R. N., Donaghue, N., & Broderick, P. (2014). Body image concern among Australian adolescent girls: The role of body comparisons with models and peers. *Body Image, 11*, 81–84. doi:10.1016/j.bodyim.2013.09.006
- Carrotte, E. R., Prichard, I., & Lim, M. S. C. (2017). "Fitspiration" on social media: A content analysis of gendered images. *Journal of Medical Internet Research, 19*, e95. doi:10.2196/jmir.6368
- Cohen, R., Fardouly, J., Newton-John, T., & Slater, A. (2019). #BoPo on Instagram: An experimental investigation of the effects of viewing body positive content on young women's mood and body image. *New Media & Society, 21*, 1546–1564. doi:10.1177/1461444819826530

- Cohen, R., Newton-John, T., & Slater, A. (2017). The relationship between Facebook and Instagram appearance-focused activities and body image concerns in young women. *Body Image, 23*, 183–187. doi:10.1016/j.bodyim.2017.10.002
- Cortina, J. M. (1993). What is coefficient alpha? An examination of theory and applications. *The Journal of Applied Psychology, 78*, 98–104. doi:10.1037/0021-9010.78.1.98
- DAK-Gesundheit. (2017). *WhatsApp, Instagram und co. – so süchtig macht Social Media*. Retrieved from <https://www.eukidsonline.de/wp-content/uploads/DAK-Studie-Social-Media-Abhängigkeit.pdf>
- Davis, S. E. (2018). Objectification, sexualization, and misrepresentation: Social media and the college experience. *Social Media + Society, 4*, 205630511878672. doi:10.1177/2056305118786727
- Deighton-Smith, N., & Bell, B. T. (2018). Objectifying fitness: A content and thematic analysis of #fitspiration images on social media. *Psychology of Popular Media Culture, 7*, 467–483. doi:10.1037/ppm0000143
- Dill, K. E., & Thill, K. P. (2007). Video game characters and the socialization of gender roles: Young people's perceptions mirror sexist media depictions. *Sex Roles, 57*, 851–864. doi:10.1007/s11199-007-9278-1
- Downs, E., & Smith, S. L. (2010). Keeping abreast of hypersexuality: A video game character content analysis. *Sex Roles, 62*, 721–733. doi:10.1007/s11199-009-9637-1
- Enders, C., & Bandalos, D. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling: A Multidisciplinary Journal, 8*, 430–457. doi:10.1207/S15328007SEM0803_5
- Fardouly, J., Diedrichs, P. C., Vartanian, L. R., & Halliwell, E. (2015). The mediating role of appearance comparisons in the relationship between media usage and self-objectification in young women. *Psychology of Women Quarterly, 39*, 447–457. doi:10.1177/0361684315581841
- Fardouly, J., & Vartanian, L. R. (2015). Negative comparisons about one's appearance mediate the relationship between Facebook usage and body image concerns. *Body Image, 12*, 82–88. doi:10.1016/j.bodyim.2014.10.004
- Fardouly, J., Willburger, B. K., & Vartanian, L. R. (2017). Instagram use and young women's body image concerns and self-objectification: Testing mediational pathways. *New Media & Society, 20*, 1380–1395. doi:10.1177/1461444817694499

- Fatt, S. J., Fardouly, J., & Rapee, R. M. (2019). #malefitspo: Links between viewing fitspiration posts, muscular-ideal internalisation, appearance comparisons, body satisfaction, and exercise motivation in men. *New Media & Society*, *21*, 1311–1325. doi:10.1177/1461444818821064
- Feltman, C. E., & Szymanski, D. M. (2018). Instagram use and self-objectification: The roles of internalization, comparison, appearance commentary, and feminism. *Sex Roles*, *78*, 311–324. doi:10.1007/s11199-017-0796-1
- Fox, J., Ralston, R. A., Cooper, C. K., & Jones, K. A. (2015). Sexualized avatars lead to women's self-objectification and acceptance of rape myths. *Psychology of Women Quarterly*, *39*, 349–362. doi:10.1177/0361684314553578
- Fredrickson, B. L., & Roberts, T.-A. (1997). Objectification theory: Toward understanding women's lived experiences and mental health risks. *Psychology of Women Quarterly*, *21*, 173–206. doi:10.1111/j.1471-6402.1997.tb00108.x
- Ghaznavi, J., & Taylor, L. D. (2015). Bones, body parts, and sex appeal: An analysis of #thinspiration images on popular social media. *Body Image*, *14*, 54–61. doi:10.1016/j.bodyim.2015.03.006
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (Eighth edition). Andover, Hampshire: Cengage Learning EMEA.
- Harrison, K., & Bond, B. J. (2007). Gaming magazines and the drive for muscularity in preadolescent boys: a longitudinal examination. *Body Image*, *4*, 269–277. doi:10.1016/j.bodyim.2007.03.003
- Hayes, A. F., & Scharkow, M. (2013). The relative trustworthiness of inferential tests of the indirect effect in statistical mediation analysis: Does method really matter? *Psychological Science*, *24*, 1918–1927. doi:10.1177/0956797613480187
- Helfert, S., & Warschburger, P. (2013). The face of appearance-related social pressure: gender, age and body mass variations in peer and parental pressure during adolescence. *Child and Adolescent Psychiatry and Mental Health*, *7*, 1–11. doi:10.1186/1753-2000-7-16
- Holland, G., & Tiggemann, M. (2016). A systematic review of the impact of the use of social networking sites on body image and disordered eating outcomes. *Body Image*, *17*, 100–110. doi:10.1016/j.bodyim.2016.02.008
- Hopper. (2019). Instagram rich list 2019. Retrieved from <https://www.hopperhq.com/blog/instagram-rich-list/>

- Hu, L.-t., & Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods*, *3*, 424–453. doi:10.1037/1082-989X.3.4.424
- Hussey, I., & Hughes, S. (2020). Hidden invalidity among 15 commonly used measures in social and personality psychology. *Advances in Methods and Practices in Psychological Science*, *3*, 166-184. doi:10.1177/2515245919882903
- Karsay, K., Knoll, J., & Matthes, J. (2017). Sexualizing media use and self-objectification: A meta-analysis. *Psychology of Women Quarterly*, advance online publication. doi:10.1177/0361684317743019
- Keery, H., van den Berg, P., & Thompson, J. K. (2004). An evaluation of the tripartite influence model of body dissatisfaction and eating disturbance with adolescent girls. *Body Image*, *1*, 237–251. doi:10.1016/j.bodyim.2004.03.001
- Knauss, C., Paxton, S. J., & Alsaker, F. D. (2008). Body dissatisfaction in adolescent boys and girls: Objectified body consciousness, internalization of the media body ideal and perceived pressure from media. *Sex Roles*, *59*, 633–643. doi:10.1007/s11199-008-9474-7
- Lerner, R. M., & Steinberg, L. (2009). *Handbook of Adolescent Psychology*. Hoboken, NJ, USA: John Wiley & Sons, Inc.
- Little, T. D., Rhemtulla, M., Gibson, K., & Schoemann, A. M. (2013). Why the items versus parcels controversy needn't be one. *Psychological Methods*, *18*, 285–300. doi:10.1037/a0033266
- Liu, R., & Suh, A. (2017). Self-branding on social media: An analysis of style bloggers on Instagram. *Procedia Computer Science*, *124*, 12–20. doi:10.1016/j.procs.2017.12.124
- Lynch, T., Tompkins, J. E., van Driel, I. I., & Fritz, N. (2016). Sexy, strong, and secondary: A content analysis of female characters in video games across 31 years. *Journal of Communication*, *66*, 564–584. doi:10.1111/jcom.12237
- Martins, Y., Tiggemann, M., & Kirkbride, A. (2007). Those speedos become them: The role of self-objectification in gay and heterosexual men's body image. *Personality & Social Psychology Bulletin*, *33*, 634–647. doi:10.1177/0146167206297403
- McKinley, N. M., & Hyde, J. S. (1996). The objectified body consciousness scale: development and validation. *Psychology of Women Quarterly*, *20*, 181–215. doi:10.1111/j.1471-6402.1996.tb00467.x

- McLean, S. A., Paxton, S. J., & Wertheim, E. H. (2016). Does media literacy mitigate risk for reduced body satisfaction following exposure to thin-ideal media? *Journal of Youth and Adolescence*, *45*, 1678–1695. doi:10.1007/s10964-016-0440-3
- Medienpädagogischer Forschungsverbund Südwest. (2019). *JIM-Studie 2019: Jugend, Information, Medien*. Retrieved from <https://www.mpfs.de/studien/jim-studie/2019/>
- Moradi, B. (2010). Addressing gender and cultural diversity in body image: Objectification theory as a framework for integrating theories and grounding research. *Sex Roles*, *63*, 138–148. doi:10.1007/s11199-010-9824-0
- Moradi, B. (2011). Objectification theory: Areas of promise and refinement. *The Counseling Psychologist*, *39*, 153–163. doi:10.1177/0011000010384279
- Moradi, B., & Huang, Y.-P. (2008). Objectification theory and psychology of women: A decade of advances and future directions. *Psychology of Women Quarterly*, *32*, 377–398. doi:10.1111/j.1471-6402.2008.00452.x
- Morry, M. M., & Staska, S. L. (2001). Magazine exposure: Internalization, self-objectification, eating attitudes, and body satisfaction in male and female university students. *Canadian Journal of Behavioural Science / Revue Canadienne des Sciences du Comportement*, *33*, 269–279. doi:10.1037/h0087148
- Noll, S. M., & Fredrickson, B. L. (1998). A mediational model linking self-objectification, body shame, and disordered eating. *Psychology of Women Quarterly*, *22*, 623–636. doi:10.1111/j.1471-6402.1998.tb00181.x
- Peat, C. M., & Muehlenkamp, J. J. (2011). Self-objectification, disordered eating, and depression: A test of mediational pathways. *Psychology of Women Quarterly*, *35*, 441–450. doi:10.1177/0361684311400389
- Raftery, A. E. (1995). Bayesian model selection in social research. *Sociological Methodology*, *25*, 111–163. doi:10.2307/271063
- Read, G. L., Lynch, T., & Matthews, N. L. (2018). Increased cognitive load during video game play reduces rape myth acceptance and hostile sexism after exposure to sexualized female avatars. *Sex Roles*, *5*, 279. doi:10.1007/s11199-018-0905-9
- Robinson, L., Prichard, I., Nikolaidis, A., Drummond, C., Drummond, M., & Tiggemann, M. (2017). Idealised media images: The effect of fitspiration imagery on body satisfaction and exercise behaviour. *Body Image*, *22*, 65–71. doi:10.1016/j.bodyim.2017.06.001
- Saiphoo, A. N., & Vahedi, Z. (2019). A meta-analytic review of the relationship between social media use and body image disturbance. *Computers in Human Behavior*, *101*, 259–275. doi:10.1016/j.chb.2019.07.028

- Schaefer, L. M., Harriger, J. A., Heinberg, L. J., Soderberg, T., & Kevin Thompson, J. (2017). Development and validation of the sociocultural attitudes towards appearance questionnaire-4-revised (SATAQ-4R). *The International Journal of Eating Disorders*, *50*, 104–117. doi:10.1002/eat.22590
- Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online*, *8*(2), 23–74.
- Schlomer, G. L., Bauman, S., & Card, N. A. (2010). Best practices for missing data management in counseling psychology. *Journal of Counseling Psychology*, *57*, 1–10. doi:10.1037/a0018082
- Sevic, S., Ciprić, A., Buško, V., & Štulhofer, A. (2019). The relationship between the use of social networking sites and sexually explicit material, the internalization of appearance ideals and body self-surveillance: results from a longitudinal study of male adolescents. *Journal of Youth and Adolescence*, *49*, 383–398. doi:10.1007/s10964-019-01172-2
- Shroff, H., & Thompson, J. K. (2006). The tripartite influence model of body image and eating disturbance: A replication with adolescent girls. *Body Image*, *3*, 17–23. doi:10.1016/j.bodyim.2005.10.004
- Striegel-Moore, R. H., & Bulik, C. M. (2007). Risk factors for eating disorders. *The American Psychologist*, *62*, 181–198. doi:10.1037/0003-066X.62.3.181
- Thompson, J. K., Heinberg, L. J., Altabe, M., & Tantleff-Dunn, S. (1999). *Exacting beauty: Theory, assessment, and treatment of body image disturbance*. Washington: American Psychological Association.
- Thompson, J. K., van den Berg, P., Roehrig, M., Guarda, A. S., & Heinberg, L. J. (2004). The sociocultural attitudes towards appearance scale-3 (SATAQ-3): Development and validation. *The International Journal of Eating Disorders*, *35*, 293–304. doi:10.1002/eat.10257
- Thompson, J. K., Heinberg, L., & Tantleff-Dunn, S. (1991). The physical appearance comparison scale. *The Behavior Therapist*, *14*, 174.
- Tiggemann, M., & Lynch, J. E. (2001). Body image across the life span in adult women: The role of self-objectification. *Developmental Psychology*, *37*, 243–253. doi:10.1037/0012-1649.37.2.243
- Tiggemann, M., & Williams, E. (2011). The role of self-objectification in disordered eating, depressed mood, and sexual functioning among women. *Psychology of Women Quarterly*, *36*, 66–75. doi:10.1177/0361684311420250

- Tiggemann, M., & Zaccardo, M. (2015). "Exercise to be fit, not skinny": The effect of fitspiration imagery on women's body image. *Body Image, 15*, 61–67. doi:10.1016/j.bodyim.2015.06.003
- Tiggemann, M., & Zaccardo, M. (2018). 'Strong is the new skinny': A content analysis of #fitspiration images on Instagram. *Journal of health psychology, 23*, 1003–1011. doi:10.1177/1359105316639436
- Twenge, J. M., Martin, G. N., & Spitzberg, B. H. (2019). Trends in U.S. adolescents' media use, 1976–2016: The rise of digital media, the decline of TV, and the (near) demise of print. *Psychology of Popular Media Culture, 8*, 329–345. doi:10.1037/ppm0000203
- van de Schoot, R., Lugtig, P., & Hox, J. (2012). A checklist for testing measurement invariance. *European Journal of Developmental Psychology, 9*, 486–492. doi:10.1080/17405629.2012.686740
- van den Berg, P., Thompson, J.K., Obremski-Brandon, K., & Covert, M. (2002). The tripartite influence model of body image and eating disturbance. *Journal of Psychosomatic Research, 53*, 1007–1020. doi:10.1016/S0022-3999(02)00499-3
- Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods, 3*, 4–70. doi:10.1177/109442810031002
- Vandenbosch, L., Driesmans, K., Trekels, J., & Eggermont, S. (2017). Sexualized video game avatars and self-objectification in adolescents: The role of gender congruency and activation frequency. *Media Psychology, 20*, 221–239. doi:10.1080/15213269.2016.1142380
- Vandenbosch, L., & Eggermont, S. (2012). Understanding sexual objectification: A comprehensive approach toward media exposure and girls' internalization of beauty ideals, self-objectification, and body surveillance. *Journal of Communication, 62*, 869–887. doi:10.1111/j.1460-2466.2012.01667.x
- Vandenbosch, L., & Eggermont, S. (2015). The role of mass media in adolescents' sexual behaviors: Exploring the explanatory value of the three-step self-objectification process. *Archives of Sexual Behavior, 44*, 729–742. doi:10.1007/s10508-014-0292-4
- Vandenbosch, L., & Eggermont, S. (2016). The interrelated roles of mass media and social media in adolescents' development of an objectified self-concept. *Communication Research, 43*, 1116–1140. doi:10.1177/0093650215600488
- Vries, D. A. de, Peter, J., Graaf, H. de, & Nikken, P. (2016). Adolescents' social network site use, peer appearance-related feedback, and body dissatisfaction: Testing a mediation

- model. *Journal of Youth and Adolescence*, 45, 211–224. doi:10.1007/s10964-015-0266-4
- Wang, Y., Xie, X., Fardouly, J., Vartanian, L. R., & Lei, L. (2019). The longitudinal and reciprocal relationships between selfie-related behaviors and self-objectification and appearance concerns among adolescents. *New Media & Society*, 9, 1-22. doi:10.1177/1461444819894346
- Ward, L. M. (2016). Media and sexualization: State of empirical research, 1995-2015. *Journal of Sex Research*, 53, 560–577. doi:10.1080/00224499.2016.1142496

Table 1
Scale Range and Descriptive Statistics for Study Variables by Participants' Gender

Time Variable	N items	Possible Range	Total M (SD)	Young Women M (SD)	Young Men M (SD)	Gender comparison <i>t</i> -test	<i>p</i> ^a	Cohen's <i>d</i>
T1 SII use	6	1-5	2.59 (1.03)	2.80 (1.03)	2.37 (1.00)	<i>t</i> (621) = 5.33	<.001	0.43
T1 SVG use	4	1-4	1.66 (0.62)	1.67 (0.65)	1.65 (0.60)	<i>t</i> (394) = .20	.84	0.02
T1 Appearance comparison	5	1-5	2.33 (0.83)	2.53 (0.83)	2.12 (0.77)	<i>t</i> (620) = 6.51	<.001	0.52
T1 Thin-ideal internalization	3	1-5	2.53 (1.01)	2.93 (0.98)	2.13 (0.88)	<i>t</i> (622) = 10.79	<.001	0.87
T1 Muscular-ideal internalization	4	1-5	2.62 (1.14)	1.94 (0.87)	3.32 (0.95)	<i>t</i> (621) = -18.91	<.001	-1.52
T1 Valuing appearance	10	-25 - +25	-12.11 (10.12)	-10.42 (10.58)	-13.95 (9.25)	<i>t</i> (600) = 4.37	<.001	0.36
T1 Body surveillance	7	1-4	2.58 (.62)	2.82 (.56)	2.33 (.58)	<i>t</i> (622) = 10.58	<.001	0.85
T2 Valuing appearance	10	-25 - +25	-10.69 (10.43)	-9.34 (10.56)	-12.00 (10.16)	<i>t</i> (569) = 3.07	.002	0.26
T2 Body surveillance	7	1-4	2.55 (.60)	2.78 (.56)	2.33 (.57)	<i>t</i> (576) = 9.50	<.001	0.79

Note. SSI = sexualized Instagram images; SVG = sexualized video games; T1 = Time 1; T2 = Time 2 (6 months after T1).

^aCritical *p* (.05/9) = .006.

Table 2
Correlations among Study Variables by Participants' Gender

Time Variable	Correlations								
	1	2	3	4	5	6	7	8	9
1. T1 SII use	--	.24*	.25***	.13*	.20***	.14*	.17**	.15*	.16**
2. T1 SVG use	.14*	--	.17	.10	.05	.09	.23*	.09	.11
3. T1 Appearance comparison	.26***	.17**	--	.43***	.16**	.36***	.67***	.28***	.62***
4. T1 Thin-ideal internalization	-.05	.04	.23***	--	.15**	.25***	.48***	.26***	.40***
5. T1 Muscular-ideal internalization	.36***	.10	.41***	.15*	--	.05	.10	-.03	.06
6. T1 Self-objectification	.28***	.13*	.28**	.11	.40	--	.42***	.64***	.36***
7. T1 Body surveillance	.33***	.15**	.60***	.24***	.43***	.35***	--	.37***	.73***
8. T2 Self-objectification	.25***	.25***	.22***	.20**	.34***	.55***	.31***	--	.40***
9. T2 Body surveillance	.26***	.17**	.53***	.15*	.40***	.30***	.74***	.36***	--

Note. SSI = sexualized Instagram images, SVG = sexualized video games; T1 = Time 1; T2 = Time 2 (6 months after T1). Correlations for female adolescents are above the diagonal of the correlation matrix; for male adolescents, below.

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

Table 3*Indirect Paths in the Proposed Model*

Indirect paths (Standardized)	<i>b</i> [95 or 99% CI]
SVG use T1 → Appearance comparisons T1 → Thin-ideal internalization T1 → Valuing appearance T2 → Body surveillance T2	.01* [.003, .01]
SVG use T1 → Appearance comparisons T1 → Muscular-ideal internalization T1 → Valuing appearance T2 → Body surveillance T2	.00 [-.004, .001]
SVG use T1 → Thin-ideal internalization T1 → Valuing appearance T2 → Body surveillance T2	.002 [-.01, 0.02]
SVG use T1 → Muscular-ideal internalization T1 → Valuing appearance T2 → Body surveillance T2	.00 [-.002, .01]
SVG use T1 → Valuing appearance T2 → Body surveillance T2	.08** [.02, .18]
SII use T1 → Appearance comparisons T1 → Thin-ideal internalization T1 → Valuing appearance T2 → Body surveillance T2	.002 [.00, .01]
SII use T1 → Appearance comparisons T1 → Muscular-ideal internalization T1 → Valuing appearance T2 → Body surveillance T2	.00 [-.002, .001]
SII use T1 → Thin-ideal internalization T1 → Valuing appearance T2 → Body surveillance T2	-.001 [-.01, .003]
SII use T1 → Muscular-ideal internalization T1 → Valuing appearance T2 → Body surveillance T2	-.001 [-.01, .003]
SII use T1 → Valuing appearance T2 → Body surveillance T2	.03** [.003, .08]

Note. For nonsignificant results, the 95% CIs are presented.

* $p < .05$ [95% CI]. ** $p < .01$ [99% CI].

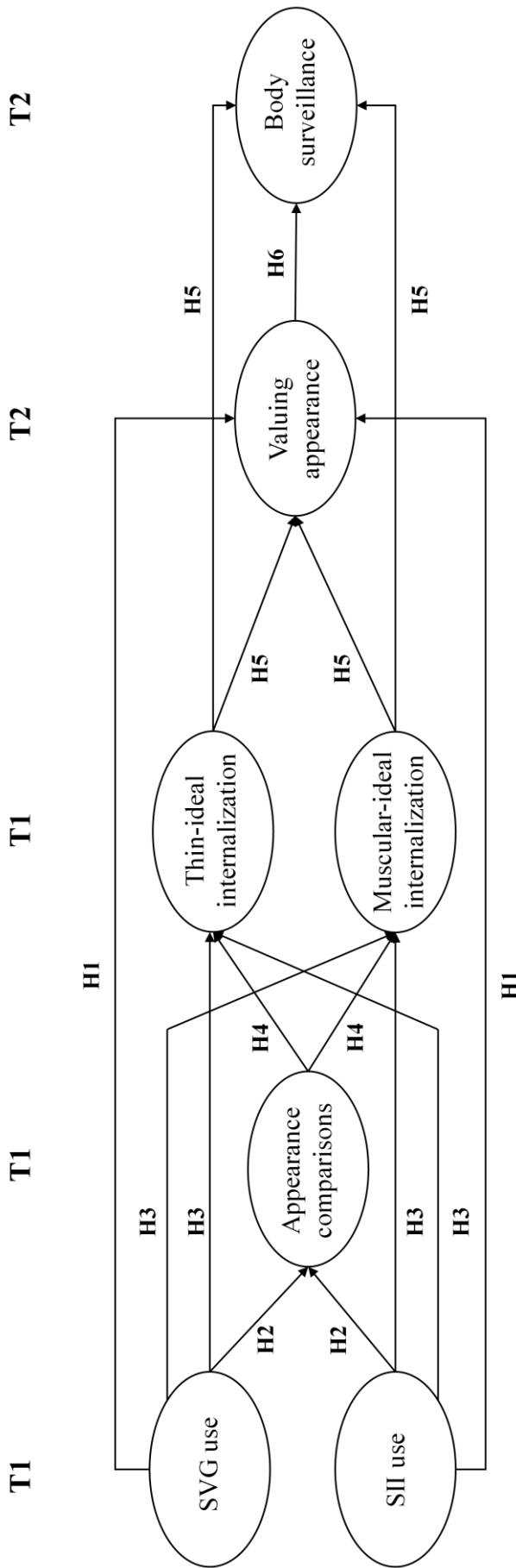


Figure 1. Proposed model of the relations among SVG (sexualized video games) and SII (sexualized Instagram images) use, appearance comparisons, thin- and muscular-ideal internalization, valuing appearance, and body surveillance across time (T1–T2 is 6 months) as well as their relevant hypotheses H1–H6). Indirect paths proposed in Hypotheses 7 to 9 are not shown in the model

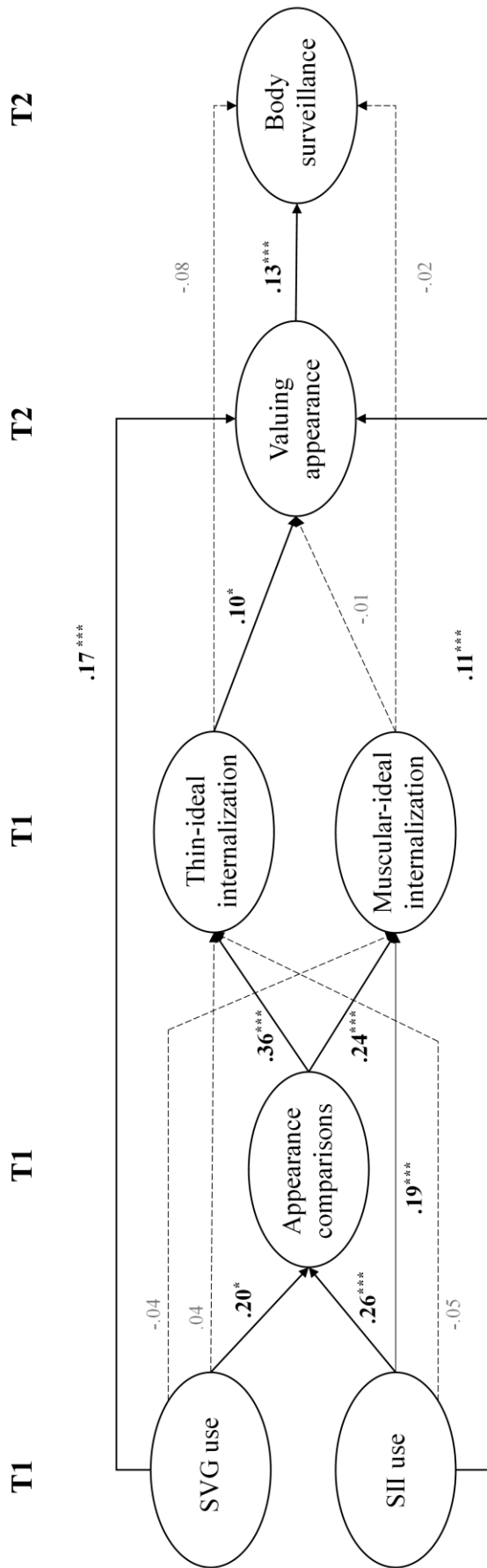


Figure 2. Standardized path coefficients for the relations among SVG (sexualized video games) and SII (sexualized Instagram images) use, appearance comparisons, thin- and muscular-ideal internalization, and SII (sexualized Instagram images) use, valuing appearance and body surveillance across time (T1–T2 is 6 months). All analyses controlled for BMI and age. T2 variables controlled for the respective T1 values. Grey, dashed pathways are not significant. * $p < .05$. *** $p < .001$.

8 General Discussion

According to objectification theory (Fredrickson & Roberts, 1997), experiences of sexualization lead individuals to develop an observers' perspective on their body, a process called self-objectification. Sexualized media is attributed a key role in this process because it is seen as a daily source of sexualization experiences. Corroborating this assumption, the use of sexualized media has shown to increase self-objectification (Ward, 2016). Nevertheless, there is a lack of research concerning interactive and social media. Furthermore, research is needed examining possible mediators and moderators of the relation between sexualized media and self-objectification. The major aim of this doctoral dissertation was to fill these gaps in the literature by examining various nontraditional media types and understudied samples. In addition, mediators and moderators of the relation were investigated with regard to specific characteristics of the media formats and samples included in the respective studies. The research questions were addressed within the scope of four empirical studies. These studies aimed to a) investigate the experimental effects of sexualized video game characters and character personalization on women's self-objectification and body satisfaction (Study 1), b) provide more insights into the role of age in the cross-sectional relation between sexualized television exposure and self-objectification by investigating whether age was a moderator in the proposed relation using a sample of women across a broad age spectrum (Study 2), c) examine the cross-sectional relations between gendered sexualized Instagram images and female and male adolescents' self-objectification (Study 3), and d) investigate the relations between female and male adolescents' sexualized video game and Instagram use and self-objectification in a longitudinal design, further exploring the mediating role of thin-ideal internalization, muscular-ideal internalization, and appearance comparisons (Study 4). The following sections provide a summary and an integrative discussion of the main findings. Furthermore, practical implications as well as strengths and limitations will be discussed.

8.1 The role of interactive and social media in the relation between sexualized media and self-objectification

Previous research has shown that the use of sexualized traditional media, such as magazines and television, is positively associated with valuing appearance and body surveillance (Karsay et al., 2018; Ward, 2016). However, there is a lack of studies examining these relations in interactive and social media, although sexualization features prominently in both media formats (Carrotte et al., 2017; Downs & Smith, 2010) and user rates are high especially among adolescents (DAK-Gesundheit, 2017; Twenge et al., 2019). This research gap

was addressed within the scope of the first, the third and the fourth study of this thesis. The first study measured experimental effects of sexualized video game use on self-objectification and body satisfaction, the third study measured adolescents' sexualized Instagram use and its relation to self-objectification in a cross-sectional design. Building on these two studies, the fourth study investigated longitudinal relations of both sexualized video game and Instagram use and self-objectification.

8.1.1 Interactive media

Concerning interactive media, it was hypothesized that the sexualization of a video game avatar would lead young women to express higher state self-objectification in the pre-registered experiment covered in Study 1. The results of this study did not support these hypotheses, as women did not show increased state self-objectification. This finding was supported by additional Bayesian analyses showing moderate support for the null hypothesis, and is in line with two other studies that used similar methodology and found no effect of character sexualization on self-objectification (Lindner et al., 2020; Read et al., 2018). Methodologically speaking, these studies were strong as they used pre-registration, a-priori power analyses and large sample sizes. Taken together, these previous findings as well as the result of the present study speak for the absence of a short-time effect of sexualization in video games on women's self-objectification. However, some experimental studies found the hypothesized effect (Fox et al., 2015; Vandenbosch et al., 2017). These studies may be chance findings, but there is also the possibility that certain factors of this dissertation's experiment prevented the hypothesized effect to occur. The presence of others increases self-objectification (Calogero, 2004), and usually video gamers do interact with other avatars in the game. In the present study, this was prevented to enhance experimental control. Another possibility is that a single session might not be sufficient to increase self-objectification but that the effect of sexualization in video games develops over time. This possibility is supported by the longitudinal research in Study 4: Adolescents' sexualized video game use was linked to their self-objectification over the course of six months. Specifically, sexualized video game use indirectly increased body surveillance via appearance comparisons, thin-ideal internalization, and valuing appearance. This result indicates that there are negative long-term effects of sexualized video games on adolescents' body image. As the findings further demonstrate, several mediators are involved in the relation between sexualized interactive media and self-objectification. Therefore, future experimental research should test whether character sexualization increases the mediators, such as appearance comparisons, instead of self-objectification.

A feature that differentiates interactive media from their traditional counterparts is the users' ability to control their characters. Yee and Bailenson (2007) argue that, as a result, effects of interactive media have different underlying mechanisms compared to traditional media: Instead of priming effects, the so-called Proteus effect causes people to infer the characteristics of their digital avatar onto themselves. Building on this rationale, it was hypothesized that in case of the Proteus effect, participants in the first study should show greater body satisfaction after playing a sexualized compared to a nonsexualized avatar. In case of priming effects, participants should report lower body satisfaction, as indicated by previous research using traditional media (Aubrey et al., 2009). No evidence was found for either of the hypotheses: Participants' body satisfaction scores were not different in the two groups, with moderate support for the null hypothesis in Bayesian analyses. Hence, on the basis of this study, no clear statements about the underlying mechanisms of interactive media effects on body satisfaction can be made. Because a large body of research indicates that sexualization in traditional media has negative short-term effects on body satisfaction (Ward, 2016), the question remains why this effect did not occur in the present research. One reason might be that the interactive nature of video games shifts people's attention away from the sexualization of its protagonists and renders their agentic nature salient. This would have implications for objectification theory, as it offers the possibility that the proposed effects of sexualization do not occur in the context of interactive media. Nevertheless, the results of Study 4 indicate that long-term effects of sexualized video game use are present at least among adolescents. Having this in mind, research is needed to examine under which conditions sexualized video game characters affect individuals' body image concerns.

This thesis further aimed to examine whether specific features of interactive media change the effects of sexualization on women's body image as proposed by objectification theory. As such, character personalization was manipulated in Study 1, and it was predicted that it would strengthen the effect of character sexualization on self-objectification and body satisfaction. The results of Study 1 did not offer evidence for this hypothesis.

8.1.2 Social media

Social media are often purely image-based, like the popular platform Instagram. As such, short-time effects of sexualized Instagram images on self-objectification are comparable to those documented in the studies using magazine images (Ward, 2016). Still, Instagram differs from magazine images because it features peers, family members and influencers who seem to be the "person next door". It has been argued that these features might make it more likely that

people experience body image concerns when using social media (Fardouly & Vartanian, 2016; G. Holland & Tiggemann, 2016). The present thesis looked at the relations between the exposure to sexualized Instagram images and self-objectification cross-sectionally (Study 3) and longitudinally (Study 4). As expected, both studies showed that the use of sexualized Instagram images was indirectly associated with valuing appearance and body surveillance cross-sectionally and over time. However, the two studies found different mediating pathways, as further discussed in Section 8.3. These results suggest that the exposure to sexualization on Instagram may indeed be harmful to adolescents' body image.

In summary, the findings of the first, third and fourth study suggested that sexualized interactive media might not have short-term effects on self-objectification, but that these effects develop over time, at least among adolescents. Similarly, the habitual consumption of sexualized Instagram images was shown to be related to self-objectification cross-sectionally and over time.

8.2 Relations between sexualized media and self-objectification among males as well as females beyond college age

Because research on sexualized media and self-objectification has predominantly focused on young adult or adolescent women, another major aim of this thesis was to examine the predictions of objectification theory in samples beyond this scope. Therefore, Study 2 of this dissertation examined the media–body image link in a sample of women across a broad age spectrum, and Study 3 and 4 investigated the link in a sample of both male and female adolescents. It was thus examined whether age and gender play a moderating role in the relation between sexualized media use and self-objectification.

8.2.1 Males

Including female and male adolescents, the third and the fourth study of this dissertation examined the relations between sexualized media use (Study 3: Instagram, Study 4: video games and Instagram) and self-objectification and investigated the role of gender in these relations. The two studies have come to different conclusions. In Study 4, gender was not found to be a moderator. This study found longitudinal associations between adolescents' sexualized media use and body surveillance via several mediators: In the case of sexualized video game use, via appearance comparisons, thin-ideal internalization, and valuing appearance, in the case of sexualized Instagram images, via valuing appearance. However, different results for the role of gender were found in Study 3. This study measured female and male adolescents' sexualized Instagram use in a cross-sectional design but focused on the gender of the sexualized subjects

on Instagram: It was distinguished how often adolescents see female or male sexualization on Instagram, and different facets of appearance-ideal internalization were considered. Accordingly, it was hypothesized that female sexualization would be associated with thin-ideal internalization for girls, and male sexualization would be linked to muscular-ideal internalization for boys. It was further expected that both thin- and muscular-ideal internalization would be linked to valuing appearance and body surveillance for both genders. The findings of the study partially supported the hypotheses: Female sexualization was linked to body surveillance via thin-ideal internalization and valuing appearance only for girls. However, the results also differed from the hypotheses: Male sexualization was linked to body surveillance via muscular-ideal internalization not only for boys, but also for girls. Furthermore, valuing appearance was not connected to body surveillance for males, but only for girls. What can be concluded from these findings? First, they tell us that when the gender of the sexualized target on Instagram is taken into account, the users' gender might be a moderating factor of the relation between sexualized media and self-objectification. Second, valuing appearance might not play a key role in the relations between media use and body surveillance for males. It is possible that other factors mediate this relation. However, it is important to note that the path from valuing appearance to body surveillance was significant for both boys and girls in Study 4. Because the fourth study had a much larger sample size, and the coefficients of the respective paths are very similar in Study 3 and 4, the reason for its insignificance in Study 3 might simply be explained by a lack of power. Nevertheless, the findings clearly indicate the need for more research among boys and men.

8.2.2 Females beyond college age

Apart from the inclusion of male samples, this thesis included a study examining a clearly understudied group when looking at sexualized media use and body image concerns: women beyond college age. As there had been no study on sexualized media including older women, the second study of this thesis investigated the relations of sexualized television exposure and self-objectification within a sample across a broad age spectrum (15 – 72 years). Consideration of cosmetic surgery was further examined as another outcome of sexualized media and self-objectification that might be particularly relevant for middle-aged women (Slevec & Tiggemann, 2010). The results of this study revealed that sexualized television exposure was indirectly related to body surveillance via valuing appearance. This means that the relation that has been found for young women holds for women of all ages, indicating that women beyond college age might also experience negative effects of sexualized media that are documented extensively for younger women (Ward, 2016). In line with previous research

(Clarke & Korotchenko, 2011), it was found that women expressed fewer body image concerns with higher age. Furthermore, age did not moderate the paths from sexualized television exposure to body image concerns. These results have implications for objectification theory: They imply that the premises hold for women of all ages, but that women become more positive about their body with increasing age. As Clarke and Korotchenko (2011) argue, women might value their body more for its functionality than for its appearance when growing older. However, this assumption still needs to be tested.

Results of the second study further suggested another outcome of sexualized media and self-objectification: Women's consideration of cosmetic surgery was predicted by body surveillance for women of all ages, representing a meaningful extension of objectification theory and adding this variable to the long list of negative variables connected to self-objectification (Quinn et al., 2011; Tiggemann, 2011). Furthermore, consideration of cosmetic surgery was directly predicted by sexualized television exposure for women over 30, indicating that from 30 years on, higher use of sexualized television is linked with a higher probability to consider cosmetic surgery at some point in the future with increasing age.

Taken together, the findings of this dissertation indicate that sexualized media is linked to self-objectification not only for young women, but also for boys and women beyond college age. Age did not moderate the link. Instead, age was found to strengthen the link between sexualized media and consideration of cosmetic surgery for women over 30. With regard to the possible moderating role of gender, different results were found: The longitudinal study did not find a moderating effect of gender when looking at the links between sexualized media use and self-objectification. However, concerning sexualized Instagram use in Study 3, gender was found to be a moderator: Seeing male sexualization on Instagram was associated with body image concerns for boys and girls, but seeing female sexualization was associated with body image concerns only for girls.

8.3 Mediators of the relation between sexualized media and self-objectification

A large body of evidence demonstrates that sexualized media is connected to self-objectification (Karsay et al., 2018), but less is known about the variables that mediate this relationship. Hence, a major aim of the second, third and fourth studies of this thesis was to explore the role of various constructs as mediators, namely the internalization of the thin and the muscular ideal, and appearance comparisons. Both variables have been found to mediate the relations between media use and body image concerns (Feltman & Szymanski, 2018).

Following the three-step process of self-objectification (Vandenbosch & Eggermont, 2015), sexualized media use should heighten appearance-ideal internalization, which in turn should increase valuing appearance and body surveillance. However, a major drawback of studies on the three-step process is that they measured appearance-ideal internalization with the third version of the Sociocultural Attitudes towards Appearance Questionnaire (SATAQ; Thompson et al., 2004), containing statements like “I wish I looked like the models in music videos”. This construct does not capture actual appearance ideals, like thinness and muscularity, but focuses on the general appearance of celebrities. For this reason, the studies of this dissertation used the fourth and revised version of the SATAQ (Schaefer et al., 2017). This survey updated the internalization subscale, now including two subscales of thin-ideal and muscular-ideal internalization, possibly reflecting gendered beauty ideals (Moradi, 2010).

8.3.1 Thin-ideal internalization

It was hypothesized that higher sexualized media use would be associated with higher thin-ideal internalization. In turn, thin-ideal internalization was expected to predict both valuing appearance and body surveillance. These predictions were made in the cross-sectional study examining women’s sexualized television exposure (Study 2) as well as in the cross-sectional study on adolescents’ Instagram use (Study 3) and the longitudinal study on adolescents’ video game and Instagram use (Study 4). Neither the results of Study 2 nor those of Study 4 speak for the existence of the path from sexualized media to thin-ideal internalization, as sexualized media use did not predict thin-ideal internalization in both studies. Only in Study 3, female sexualization on Instagram was linked to higher thin-ideal internalization for girls. However, the second hypothesized path from thin-ideal internalization to valuing appearance was found in all three papers. In Study 4, this prediction was even found over time, adding evidence to thin-ideal internalization being an important predecessor of valuing appearance. Less clear were the results concerning the third predicted path from thin-ideal internalization to body surveillance, which was found in the two cross-sectional studies (Study 2 and Study 3), but not in the longitudinal study. Taken together, it is unclear whether sexualized media use is directly linked to thin-ideal internalization. While thin-ideal internalization seems to reliably predict valuing appearance, doubts remain whether it predicts body surveillance as the relation was only found cross-sectionally. Importantly, research coming from the same research group that developed the three-step process of self-objectification recently applied a cross-lagged panel design to their original data and found that body surveillance might, according to their data, be at the beginning of the self-objectification chain instead of the end, thus predicting both appearance-ideal internalization and valuing appearance (Vangeel et al., 2018). Furthermore,

appearance-ideal internalization did predict neither valuing appearance nor body surveillance in the study, casting doubt on the original model presented by Vandebosch and Eggermont (2015). As these results show, more research on the constructs of the self-objectification process is definitely needed, alongside a clear discussion of their measurement.

8.3.2 Muscular-ideal internalization

Muscular-ideal internalization was only measured in the studies that included male participants (Study 3 and Study 4). In the case of Study 4, it was hypothesized that higher use of sexualized Instagram images and video games would be associated with increased levels of muscular-ideal internalization. Study 3 made additional specific assumptions concerning sexualization on Instagram: It was expected that male sexualized images specifically would be associated with muscular-ideal internalization for boys. In both studies, it was further hypothesized that muscular-ideal internalization would predict valuing appearance and body surveillance for both genders. Mixed evidence was found for these predictions. First, sexualized video game use was not associated with muscular-ideal internalization in Study 4. Second, a path from sexualized Instagram use to muscular-ideal internalization was found in Study 4, and the path from male sexualization on Instagram to muscular-ideal internalization was also found in Study 3, indicating that the concept of muscularity seems to be particularly relevant for social media. However, the path from muscular-ideal internalization to valuing appearance was not found in neither of the studies, and the path from muscular-ideal internalization to body surveillance was found only in the cross-sectional study. As such, the evidence for muscular-ideal internalization as a mediator in the link between sexualized media use and self-objectification is pretty scarce, again bringing the mediating role of appearance-ideal internalization into question. Some researchers propose that appearance-ideal internalization might not be a consequence of media use, but a predisposition (Perloff, 2014). These considerations need to be tested in future research.

8.3.3 Appearance comparisons

The fourth study of this thesis offered a new approach to mediators of the media–self-objectification link as it integrated both appearance-ideal internalization and appearance comparisons into the framework of the three-step process of self-objectification. Results of this study showed that, as expected, sexualized media use predicted appearance comparisons, and appearance comparisons further predicted both thin-ideal and muscular-ideal internalization. As previously displayed, thin-ideal internalization then increased valuing appearance over time. The findings of this study lend support to considerations from objectification theory

(Fredrickson & Roberts, 1997) and sociocultural theory (Thompson et al., 1999). They also offer an explanation for the missing paths from sexualized media use to thin-ideal and muscular-ideal internalization that were found in previous research (Vandenbosch & Eggermont, 2015). It can be argued that previous operationalizations of appearance-ideal internalization, using the third version of the SATAQ, measured two concepts at once: on one side, the tendency to compare one's appearance, and on the other side, the internalized desire to look a certain way. By measuring internalization with newer SATAQ versions and including appearance comparisons, these two concepts might have been entangled in Study 4. In line with this presumption, sexualized media might then trigger appearance comparisons, which might in turn promote the internalization of the thin and muscular ideal. However, as these paths were modeled cross-sectionally in Study 4, future longitudinal research is needed to confirm these tentative assumptions.

Taken together, the role of thin-ideal internalization as a mediator between sexualized media use and self-objectification was questioned by the results of the presented studies, as it was found only in the cross-sectional Study 3. Muscular-ideal internalization did emerge as a mediator between sexualized media use and self-objectification only in the cross-sectional study, and only for body surveillance. The same paths were not found for valuing appearance or in the longitudinal design. It seems as if muscular-ideal internalization is connected to sexualized media use but triggers other consequences than self-objectification. Finally, it was shown that appearance comparisons were a useful mediator between sexualized media use and thin-ideal internalization, consequently promoting valuing appearance.

In sum, what do the results obtained with this PhD thesis mean for objectification theory? First of all, objectification theory predicts effects of sexualized media on self-objectification, a premise that has been supported by a large body of evidence with traditional media. In line with this, the results of this PhD thesis suggest that sexualized television, social media and interactive media all predict self-objectification. At the same time, the methodologically strong experimental study found a null effect regarding interactive media, clearly underlining the need for future research on this media type. Second, this doctoral research showed that the relations between sexualized media and self-objectification are also applicable to male individuals and older individuals, pointing to a greater generalizability of objectification theory. However, boundary conditions of objectification theory are still to be figured out, as neither age, gender nor character personalization seem to be reliable moderators. Third, Fredrickson and Roberts (1997) argue that women gradually internalize the society's beauty standards in response to sexualization experiences, attributing a mediating role to thin-

and muscular-ideal internalization. The results of this doctoral research cast doubt on this claim: Although appearance-ideal internalization seems to predict self-objectification, it does not seem to be related directly to media use. Instead, objectification theory should be modified and refined: It may be useful to include appearance comparisons as a further mediator between media use and appearance-ideal internalization, a variable that has not been discussed in the original work by Fredrickson and Roberts (1997), but rather stems from sociocultural theory (Thompson et al., 1999). Integrating these two theories may be a first step towards improving the theory on media effects on body image concerns.

8.4 Implications for Practice and Future Research

The findings obtained in this doctoral dissertation have various implications for both future research and practice. On a more general level, the results are for the most part in line with objectification theory (Fredrickson & Roberts, 1997), with the use of diverse sexualized media (video games, television, Instagram) being associated with self-objectification in the cross-sectional and longitudinal studies. However, no short-time effects of the exposure to sexualized video games were found in the experiment of Study 1. Future research should therefore explore whether specific characteristics of video games prevent negative effects of sexualization on users' body image concerns in the short term.

The analyses of Study 2, 3 and 4 indicate that the mediating role of appearance-ideal internalization should be the focus of future research. While links between sexualized media use and thin-ideal internalization have been found in Study 3, the other studies did not find this direct link. However, thin-ideal internalization always predicted self-objectification, proofing its usefulness for objectification theory on a general level, but casting doubt on its link with media use. Therefore, future research should clarify whether the concept thin-ideal internalization is a mediator between media use and self-objectification, or whether other processes play an intermediate role, like appearance comparisons. Furthermore, although muscular-ideal internalization was connected to sexualized media use in Study 3 and 4, it predicted self-objectification only in the cross-sectional design. Still, correlations between muscular-ideal internalization and both valuing appearance and body surveillance were found in both studies. Hence, prospective studies should examine whether there are further intermediate processes between muscular-ideal internalization and self-objectification. As suggested by Perloff (2014), the role of appearance-ideal internalization as a vulnerability factor instead of a mediator should also be explored. In this dissertation, all pathways from media use

to appearance-ideal internalization were modelled cross-sectionally. As such, it cannot be ruled out that appearance-ideal internalization is a predictor of sexualized media use.

The findings of the second study of this dissertation demonstrated the usefulness of objectification theory for women beyond college age, indicating that these women might also experience the same negative effects of sexualized media that are widely confirmed for younger women. However, as the study was cross-sectional, the associations should be explored in longitudinal designs. Furthermore, it would be interesting to include male samples that are beyond college age, as previous research on sexualized media effects, including the studies of this thesis, predominantly examined adolescent boys or young men (Barlett et al., 2008). The findings of this thesis do not speak for compelling gender differences in the associations between media use and body image concerns. But as this dissertation explored these links with samples of adolescent boys, it cannot be ruled out that gender differences emerge in older generations or in a later stage of life.

On a practical level, the findings of this dissertation highlight the role of sexualized media in developing and maintaining body image concerns. As shown by the studies with teenagers, this process is already present in adolescence. Therefore, teachers and educators should be aware of the harmful effects of media use and might begin to explain these processes to children at a very early stage. They could also advise people to consume media that focuses on positive body image, which has been shown to trigger positive effects on body image (Cohen et al., 2019). Furthermore, policymakers could implement intervention programs that promote media literacy at schools. There are several studies indicating that negative effects of media body ideals can be buffered by media literacy programs: For example, Reichert et al. (2007) found that after watching a video about sexual objectification in the media, women were more likely to identify sexist advertising and responded more negatively to these ads than women who did not watch the video. Importantly, these effects were not found for men. Another study with girls found that the negative effect of viewing ultra-thin models on body satisfaction was prevented in those girls who had watched a video intervention before in which the digital alteration of female media images was explained (Halliwell, Easun, & Harcourt, 2011). Several more studies, all including female participants, demonstrate that adverse effects of media ideals can be prevented through intervention programs (Irving & Berel, 2001; McLean et al., 2016; Yamamiya et al., 2005). Nevertheless, it is not only the user who should be warned and trained. Media content does not magically happen to be there – it is out there because video game developers, Instagram influencers, television managers and many more persons create it, share it, and advertise it. As such, the findings of this dissertation speak to the responsibility of the

people in charge, who should be conscious of the consequences of their actions and create media content in a nonsexualized way. Policymakers could help this process by passing laws as happened in London, where sexually objectifying advertisement was forbidden in the public transport system.

8.5 Strengths and Limitations

The research presented in this dissertation has several strengths. First, the diverse methodological approach including cross-sectional, longitudinal, and experimental designs represents a major strength. Second, the experimental study of this research used a registered report, advancing open science and the quality of psychological research. Third, the use of a longitudinal design to study the socialization processes presumed by objectification theory is a strength of this dissertation, as it allows to control for past levels of the outcomes. A fourth strength is the use of samples that are diverse regarding certain characteristics: The female sample of the second study covered a wide age range, and in the third and the fourth study, girls and boys were included allowing gender-specific testing of hypotheses.

Despite these strengths, the results of this research should be evaluated in the context of several limitations: First, two of the four studies were correlational. As such, the temporal order of the variables is up to debate, especially considering the null result of the experimental study. Although the longitudinal study showed a temporal order of the relation between sexualized media and self-objectification, only two time points were considered in this study. The complete chain of the process from media use to self-objectification covers five steps, and thus several relations had to be modelled cross-sectionally. Specifically, the relation between media use and the mediator appearance-ideal internalization was modelled cross-sectionally in all studies of this dissertation, which means that the temporal order has to be established in future studies. Another limitation concerns the samples of the studies: Although, as mentioned previously, there was diversity regarding age and gender, the first and the second study relied on well-educated participants. Future research should focus on participants with a lower socioeconomic status, as it is linked with higher media use (Stamatakis et al., 2009). Moreover, only female and male participants were included in the studies of this dissertation, representing a gender-binary approach to the topic. Sexualized people in the media are mostly female and male – as such, it might be a particularly interesting question whether sexualized media portrayals affect people of other genders differently because they might not identify with the depicted persons in the same way as female and male media users do.

8.6 Conclusion

This doctoral dissertation addressed multiple gaps in the literature on sexualized media use and self-objectification and provided findings that expand the knowledge of boundary conditions and circumstances that connects media use with body image concerns. Several studies of this dissertation examined understudied media types (interactive media, social media) and found that although sexualization in video games had no short-term effect on young women's body image concerns, the habitual use of sexualized video games was connected with body image concerns over time in a sample of adolescents. Similarly, seeing sexualized men and women on Instagram was connected cross-sectionally and longitudinally with body image concerns among adolescents. This thesis further advanced the research on the relations between sexualized media use and body image concerns among men, revealing only few gender differences apart from the finding that female sexualized images on Instagram seem to be connected only to adolescent women's body image concerns, but not to men's. All other processes linking media use to body image concerns were not moderated by gender. However, men scored lower on all body image variables except for muscular-ideal internalization, highlighting again that women are more at risk for developing body image problems. Furthermore, age was not found to moderate the links between sexualized television use and self-objectification but was associated with lower body image concerns. As such, future research on the role of age and the processes that lead to a better body image is recommended. Finally, this thesis expanded research on objectification theory by analyzing the role of several mediators in the media–body image link. Taken together, the findings regarding the associations between media use and thin-ideal and muscular-ideal internalization are mixed, and the longitudinal study suggest that appearance comparisons might mediate this link. This underlines the need for a better understanding of the mediating pathways between sexualized media use and body image concerns.

The results of this thesis are presented within the conceptualization of self-objectification as valuing appearance and body surveillance. Objectification researchers have pointed out various limitations of these measures (Calogero, 2011; Lindner & Tantleff-Dunn, 2017). Others recommended a new conceptualization of state self-objectification with more than one variable (Kahalon et al., 2018). These discussions show that the research field concerning objectification theory is dynamic and still in an early developmental stage, highlighting the need for future research integrating the above mentioned differing views and approaches.

The findings of this dissertation contribute to the growing literature on negative effects of media use by demonstrating that sexualization in diverse types of media can contribute to the development of body image concerns for people of different ages and genders. The findings may thus contribute to the conceptualization of intervention and prevention programs aimed to promote media literacy. At the same time, the experimental null findings warrant caution regarding the temporal order and provide a starting point for fruitful research on interactive media effects.

9 References

- American Society of Plastic Surgeons. (2018). *2018 plastic surgery statistics report*. <https://www.plasticsurgery.org/documents/News/Statistics/2018/plastic-surgery-statistics-full-report-2018.pdf>
- Anslinger, J. (2019). *Measurement and evaluation of sexual objectification* [Doctoral Dissertation]. University of Bielefeld. <https://pub.uni-bielefeld.de/record/2936501>
<https://doi.org/10.4119/unibi/2936501>
- APA Task Force on the Sexualization of Girls. (2007). *Report of the APA task force on the sexualization of girls*. <http://www.apa.org/pi/women/programs/girls/report-full.pdf>
- ARD/ZDF. (2020). *ARD/ZDF-Massenkommunikation Langzeitstudie 2020*. <https://www.ard-zdf-massenkommunikation.de>
- Aubrey, J. S. (2006). Effects of sexually objectifying media on self-objectification and body surveillance in undergraduates: Results of a 2-year panel study. *Journal of Communication, 56*(2), 366–386. <https://doi.org/10.1111/j.1460-2466.2006.00024.x>
- Aubrey, J. S. (2007). The impact of sexually objectifying media exposure on negative body emotions and sexual self-perceptions: Investigating the mediating role of body self-consciousness. *Mass Communication and Society, 10*(1), 1–23. <https://doi.org/10.1080/15205430709337002>
- Aubrey, J. S., & Gerding, A. (2015). The cognitive tax of self-objectification: Examining sexually objectifying music videos and examining female emerging adults' cognitive processing of subsequent advertising. *Journal of Media Psychology, 27*(1), 22–32. <https://doi.org/10.1027/1864-1105/a000128>
- Aubrey, J. S., Henson, J. R., Hopper, K. M., & Smith, S. E. (2009). A picture is worth twenty words (about the self): Testing the priming influence of visual sexual objectification on women's self-objectification. *Communication Research Reports, 26*(4), 271–284. <https://doi.org/10.1080/08824090903293551>
- Banakou, D., Kishore, S., & Slater, M. (2018). Virtually being Einstein results in an improvement in cognitive task performance and a decrease in age bias. *Frontiers in Psychology, 9*, 917. <https://doi.org/10.3389/fpsyg.2018.00917>
- Barlett, C. P., Vowels, C. L., & Saucier, D. A. (2008). Meta-analyses of the effects of media images on men's body image concerns. *Journal of Social and Clinical Psychology, 27*(3), 279–310. <https://doi.org/10.1521/jscp.2008.27.3.279>

- Beasley, B., & Collins Standley, T. (2002). Shirts vs. skins: Clothing as an indicator of gender role stereotyping in video games. *Mass Communication and Society*, 5(3), 279–293. https://doi.org/10.1207/S15327825MCS0503_3
- Bernard, P., Cogoni, C., & Carnaghi, A. (2020). The sexualization–objectification link: Sexualization affects the way people see and feel toward others. *Current Directions in Psychological Science*, 29(2), 134–139. <https://doi.org/10.1177/0963721419898187>
- Bozsik, F., Whisenhunt, B. L., Hudson, D. L., Bennett, B., & Lundgren, J. D. (2018). Thin is in? Think again: The rising importance of muscularity in the thin ideal female body. *Sex Roles*, 79(9-10), 609–615. <https://doi.org/10.1007/s11199-017-0886-0>
- Burgess, M. C. R., Stermer, S. P., & Burgess, S. R. (2007). Sex, lies, and video games: The portrayal of male and female characters on video game covers. *Sex Roles*, 57(5-6), 419–433. <https://doi.org/10.1007/s11199-007-9250-0>
- Calogero, R. M. (2004). A test of objectification theory: The effect of the male gaze on appearance concerns in college women. *Psychology of Women Quarterly*, 28(1), 16–21. <https://doi.org/10.1111/j.1471-6402.2004.00118.x>
- Calogero, R. M. (2009). Objectification processes and disordered eating in British women and men. *Journal of Health Psychology*, 14(3), 394–402. <https://doi.org/10.1177/1359105309102192>
- Calogero, R. M. (2011). Operationalizing self-objectification: Assessment and related methodological issues. In R. M. Calogero, S. Tantleff-Dunn, & J. K. Thompson (Eds.), *Self-objectification in women: Causes, consequences, and counteractions* (pp. 23–49). American Psychological Association. <https://doi.org/10.1037/12304-002>
- Calogero, R. M., Davis, W. N., & Thompson, J. K. (2005). The role of self-objectification in the experience of women with eating disorders. *Sex Roles*, 52(1-2), 43–50. <https://doi.org/10.1007/s11199-005-1192-9>
- Calogero, R. M., Pina, A., Park, L. E., & Rahemtulla, Z. (2010). Objectification theory predicts college women’s attitudes toward cosmetic surgery. *Sex Roles*, 63(1-2), 32–41. <https://doi.org/10.1007/s11199-010-9759-5>
- Calogero, R. M., & Thompson, J. K. (2009). Potential implications of the objectification of women's bodies for women's sexual satisfaction. *Body Image*, 6(2), 145–148. <https://doi.org/10.1016/j.bodyim.2009.01.001>
- Carrotte, E. R., Prichard, I., & Lim, M. S. C. (2017). "Fitspiration" on social media: A content analysis of gendered images. *Journal of Medical Internet Research*, 19(3), e95. <https://doi.org/10.2196/jmir.6368>

- Cash, T. F. (2004). Body image: past, present, and future. *Body Image, 1*(1), 1–5. [https://doi.org/10.1016/S1740-1445\(03\)00011-1](https://doi.org/10.1016/S1740-1445(03)00011-1)
- Clarke, L. H., & Korotchenko, A. (2011). Aging and the body: A review. *Canadian Journal on Aging = La Revue Canadienne Du Vieillissement, 30*(3), 495–510. <https://doi.org/10.1017/S0714980811000274>
- Cohen, R., Fardouly, J., Newton-John, T., & Slater, A. (2019). #BoPo on Instagram: An experimental investigation of the effects of viewing body positive content on young women's mood and body image. *New Media & Society, 21*(7), 1546–1564. <https://doi.org/10.1177/1461444819826530>
- Cohen, R., Newton-John, T., & Slater, A. (2017). The relationship between Facebook and Instagram appearance-focused activities and body image concerns in young women. *Body Image, 23*, 183–187. <https://doi.org/10.1016/j.bodyim.2017.10.002>
- Dakanalis, A., Di Mattei, V. E., Bagliacca, E. P., Prunas, A., Sarno, L., Riva, G., & Zanetti, M. A. (2012). Disordered eating behaviors among Italian men: Objectifying media and sexual orientation differences. *Eating Disorders, 20*(5), 356–367. <https://doi.org/10.1080/10640266.2012.715514>
- DAK-Gesundheit. (2017). *WhatsApp, Instagram und co. – so süchtig macht Social Media.* <https://www.eukidsonline.de/wp-content/uploads/DAK-Studie-Social-Media-Abhängigkeit.pdf>
- Daniels, E. A. (2009). Sex objects, athletes, and sexy athletes: How media representations of women athletes can impact adolescent girls and college women. *Journal of Adolescent Research, 24*(4), 399–422. <https://doi.org/10.1177/0743558409336748>
- Daniels, E. A., Zurbriggen, E. L., & Monique Ward, L. (2020). Becoming an object: A review of self-objectification in girls. *Body Image, 33*, 278–299. <https://doi.org/10.1016/j.bodyim.2020.02.016>
- Davids, C. M., Watson, L. B., & Gere, M. P. (2019). Objectification, masculinity, and muscularity: A test of objectification theory with heterosexual men. *Sex Roles, 80*(7-8), 443–457. <https://doi.org/10.1007/s11199-018-0940-6>
- Davis, S. E. (2018). Objectification, sexualization, and misrepresentation: Social media and the college experience. *Social Media + Society, 4*(3), 205630511878672. <https://doi.org/10.1177/2056305118786727>
- Deighton-Smith, N., & Bell, B. T. (2018). Objectifying fitness: A content and thematic analysis of #fitspiration images on social media. *Psychology of Popular Media Culture, 7*(4), 467–483. <https://doi.org/10.1037/ppm0000143>

- Dill, K. E., & Thill, K. P. (2007). Video game characters and the socialization of gender roles: Young people's perceptions mirror sexist media depictions. *Sex Roles, 57*(11-12), 851–864. <https://doi.org/10.1007/s11199-007-9278-1>
- Dittmar, H., & Howard, S. (2004). Thin-ideal internalization and social comparison tendency as moderators of media models' impact on women's body-focused anxiety. *Journal of Social and Clinical Psychology, 23*(6), 768–791. <https://doi.org/10.1521/jscp.23.6.768.54799>
- Downs, E., & Smith, S. L. (2010). Keeping abreast of hypersexuality: A video game character content analysis. *Sex Roles, 62*(11-12), 721–733. <https://doi.org/10.1007/s11199-009-9637-1>
- Fardouly, J., Diedrichs, P. C., Vartanian, L. R., & Halliwell, E. (2015). The mediating role of appearance comparisons in the relationship between media usage and self-objectification in young women. *Psychology of Women Quarterly, 39*(4), 447–457. <https://doi.org/10.1177/0361684315581841>
- Fardouly, J., & Vartanian, L. R. (2016). Social media and body image concerns: Current research and future directions. *Current Opinion in Psychology, 9*, 1–5. <https://doi.org/10.1016/j.copsyc.2015.09.005>
- Fardouly, J., Willburger, B. K., & Vartanian, L. R. (2018). Instagram use and young women's body image concerns and self-objectification: Testing mediational pathways. *New Media & Society, 20*(4), 1380–1395. <https://doi.org/10.1177/1461444817694499>
- Fatt, S. J., Fardouly, J., & Rapee, R. M. (2019). #malefitspo: Links between viewing fitspiration posts, muscular-ideal internalisation, appearance comparisons, body satisfaction, and exercise motivation in men. *New Media & Society, 21*(6), 1311–1325. <https://doi.org/10.1177/1461444818821064>
- Feltman, C. E., & Szymanski, D. M. (2018). Instagram use and self-objectification: The roles of internalization, comparison, appearance commentary, and feminism. *Sex Roles, 78*(5-6), 311–324. <https://doi.org/10.1007/s11199-017-0796-1>
- Fischer, P., Kastenmüller, A., & Greitemeyer, T. (2010). Media violence and the self: The impact of personalized gaming characters in aggressive video games on aggressive behavior. *Journal of Experimental Social Psychology, 46*(1), 192–195. <https://doi.org/10.1016/j.jesp.2009.06.010>
- Flynn, M. A., Park, S.-Y., Morin, D. T., & Stana, A. (2015). Anything but real: Body idealization and objectification of MTV docusoap characters. *Sex Roles, 72*(5-6), 173–182. <https://doi.org/10.1007/s11199-015-0464-2>

- Fox, J., Bailenson, J. N., & Tricase, L. (2013). The embodiment of sexualized virtual selves: The Proteus effect and experiences of self-objectification via avatars. *Computers in Human Behavior, 29*(3), 930–938. <https://doi.org/10.1016/j.chb.2012.12.027>
- Fox, J., Ralston, R. A., Cooper, C. K., & Jones, K. A. (2015). Sexualized avatars lead to women's self-objectification and acceptance of rape myths. *Psychology of Women Quarterly, 39*(3), 349–362. <https://doi.org/10.1177/0361684314553578>
- Fredrickson, B. L., & Roberts, T.-A. (1997). Objectification theory: Toward understanding women's lived experiences and mental health risks. *Psychology of Women Quarterly, 21*(2), 173–206. <https://doi.org/10.1111/j.1471-6402.1997.tb00108.x>
- Fredrickson, B. L., Roberts, T.-A., Noll, S. M., Quinn, D. M., & Twenge, J. M. (1998). That swimsuit becomes you: Sex differences in self-objectification, restrained eating, and math performance. *Journal of Personality and Social Psychology, 75*(1), 269–284. <https://doi.org/10.1037/0022-3514.75.1.269>
- Frisby, C. M., & Aubrey, J. S. (2012). Race and genre in the use of sexual objectification in female artists' music videos. *Howard Journal of Communications, 23*(1), 66–87. <https://doi.org/10.1080/10646175.2012.641880>
- Gill, R. (2009). Beyond the 'sexualization of culture' thesis: An intersectional analysis of 'sixpacks', 'midriffs' and 'hot lesbians' in advertising. *Sexualities, 12*(2), 137–160. <https://doi.org/10.1177/1363460708100916>
- Grabe, S., & Hyde, J. S. (2009). Body objectification, MTV, and psychological outcomes among female adolescents. *Journal of Applied Social Psychology, 39*(12), 2840–2858. <https://doi.org/10.1111/j.1559-1816.2009.00552.x>
- Grabe, S., Ward, L. M., & Hyde, J. S. (2008). The role of the media in body image concerns among women: A meta-analysis of experimental and correlational studies. *Psychological Bulletin, 134*(3), 460–476. <https://doi.org/10.1037/0033-2909.134.3.460>
- Graff, K. A., Murnen, S. K., & Krause, A. K. (2013). Low-cut shirts and high-heeled shoes: Increased sexualization across time in magazine depictions of girls. *Sex Roles, 69*(11-12), 571–582. <https://doi.org/10.1007/s11199-013-0321-0>
- Grey, M. J., Horgan, T. G., Long, T. A., Herzog, N. K., & Lindemulder, J. R. (2016). Contrasting Objectification and Competence. *Journal of Media Psychology, 28*(2), 88–93. <https://doi.org/10.1027/1864-1105/a000159>
- Griffiths, S., & Stefanovski, A. (2019). Thinspiration and fitspiration in everyday life: An experience sampling study. *Body Image, 30*, 135–144. <https://doi.org/10.1016/j.bodyim.2019.07.002>

- Halliwell, E., Easun, A., & Harcourt, D. (2011). Body dissatisfaction: Can a short media literacy message reduce negative media exposure effects amongst adolescent girls? *British Journal of Health Psychology*, *16*(2), 396–403. <https://doi.org/10.1348/135910710X515714>
- Halliwell, E., Malson, H., & Tischner, I. (2011). Are contemporary media images which seem to display women as sexually empowered actually harmful to women? *Psychology of Women Quarterly*, *35*(1), 38–45. <https://doi.org/10.1177/0361684310385217>
- Harrison, K., & Fredrickson, B. L. (2003). Women's sports media, self-objectification, and mental health in Black and white adolescent females. *Journal of Communication*, *53*(2), 216–232. <https://doi.org/10.1111/j.1460-2466.2003.tb02587.x>
- Hatton, E., & Trautner, M. N. (2011). Equal opportunity objectification? The sexualization of men and women on the cover of Rolling Stone. *Sexuality & Culture*, *15*(3), 256–278. <https://doi.org/10.1007/s12119-011-9093-2>
- Henderson-King, D., & Henderson-King, E. (2005). Acceptance of cosmetic surgery: Scale development and validation. *Body Image*, *2*(2), 137–149. <https://doi.org/10.1016/j.bodyim.2005.03.003>
- Holland, E., Koval, P., Stratemeyer, M., Thomson, F., & Haslam, N. (2017). Sexual objectification in women's daily lives: A smartphone ecological momentary assessment study. *The British Journal of Social Psychology*, *56*(2), 314–333. <https://doi.org/10.1111/bjso.12152>
- Holland, G., & Tiggemann, M. (2016). A systematic review of the impact of the use of social networking sites on body image and disordered eating outcomes. *Body Image*, *17*, 100–110. <https://doi.org/10.1016/j.bodyim.2016.02.008>
- Hollingdale, J., & Greitemeyer, T. (2013). The changing face of aggression: The effect of personalized avatars in a violent video game on levels of aggressive behavior. *Journal of Applied Social Psychology*, *43*(9), 1862–1868. <https://doi.org/10.1111/jasp.12148>
- Hopper. (2019). *Instagram rich list 2019*. <https://www.hopperhq.com/blog/instagram-rich-list/>
- Hopper, K. M., & Aubrey, J. S. (2013). Examining the impact of celebrity gossip magazine coverage of pregnant celebrities on pregnant women's self-objectification. *Communication Research*, *40*(6), 767–788. <https://doi.org/10.1177/0093650211422062>
- Huang, Q., Peng, W., & Ahn, S. (2020). When media become the mirror: A meta-analysis on media and body image. *Media Psychology*. Advance online publication. <https://doi.org/10.1080/15213269.2020.1737545>

- Irving, L. M., & Berel, S. R. (2001). Comparison of media-literacy programs to strengthen college women's resistance to media images. *Psychology of Women Quarterly*, 25(2), 103–111. <https://doi.org/10.1111/1471-6402.00012>
- Jackson, T., & Chen, H. (2015). Predictors of cosmetic surgery consideration among young Chinese women and men. *Sex Roles*, 73(5-6), 214–230. <https://doi.org/10.1007/s11199-015-0514-9>
- Kahalon, R., Shnabel, N., & Becker, J. C. (2018). Experimental studies on state self-objectification: A review and an integrative process model. *Frontiers in Psychology*, 9, 1268. <https://doi.org/10.3389/fpsyg.2018.01268>
- Karsay, K., Knoll, J., & Matthes, J. (2018). Sexualizing media use and self-objectification: A meta-analysis. *Psychology of Women Quarterly*, 42(1), 9-28. <https://doi.org/10.1177/0361684317743019>
- Karsay, K., & Matthes, J. (2020). Sexually objectifying pop music videos, young women's self-objectification, and selective exposure: A moderated mediation model. *Communication Research*, 47(3), 428-450. <https://doi.org/10.1177/0093650216661434>
- Keery, H., van den Berg, P., & Thompson, J. K. (2004). An evaluation of the tripartite influence model of body dissatisfaction and eating disturbance with adolescent girls. *Body Image*, 1(3), 237–251. <https://doi.org/10.1016/j.bodyim.2004.03.001>
- Konijn, E. A., Bijvank, M. N., & Bushman, B. J. (2007). I wish I were a warrior: The role of wishful identification in the effects of violent video games on aggression in adolescent boys. *Developmental Psychology*, 43(4), 1038–1044. <https://doi.org/10.1037/0012-1649.43.4.1038>
- Krawczyk, R., & Thompson, J. K. (2015). The effects of advertisements that sexually objectify women on state body dissatisfaction and judgments of women: The moderating roles of gender and internalization. *Body Image*, 15, 109–119. <https://doi.org/10.1016/j.bodyim.2015.08.001>
- Linder, J. R., & Daniels, E. A. (2018). Sexy vs. sporty: The effects of viewing media images of athletes on self-objectification in college students. *Sex Roles*, 78(1-2), 27–39. <https://doi.org/10.1007/s11199-017-0774-7>
- Lindner, D., & Tantleff-Dunn, S. (2017). The development and psychometric evaluation of the self-objectification beliefs and behaviors scale. *Psychology of Women Quarterly*, 41(2), 254–272. <https://doi.org/10.1177/0361684317692109>

- Lindner, D., Tribble, M., Pilato, I., & Ferguson, C. J. (2020). Examining the effects of exposure to a sexualized female video game protagonist on women's body image. *Psychology of Popular Media, 9*(4), 553–560. <https://doi.org/10.1037/ppm0000251>
- Liu, R., & Suh, A. (2017). Self-branding on social media: An analysis of style bloggers on Instagram. *Procedia Computer Science, 124*, 12–20. <https://doi.org/10.1016/j.procs.2017.12.124>
- López-Guimerà, G., Levine, M. P., Sánchez-carracedo, D., & Fauquet, J. (2010). Influence of mass media on body image and eating disordered attitudes and behaviors in females: A review of effects and processes. *Media Psychology, 13*(4), 387–416. <https://doi.org/10.1080/15213269.2010.525737>
- Manago, A. M., Ward, L. M., Lemm, K. M., Reed, L., & Seabrook, R. (2015). Facebook involvement, objectified body consciousness, body shame, and sexual assertiveness in college women and men. *Sex Roles, 72*(1-2), 1–14. <https://doi.org/10.1007/s11199-014-0441-1>
- Matthews, N. L., Lynch, T., & Martins, N. (2016). Real ideal: Investigating how ideal and hyper-ideal video game bodies affect men and women. *Computers in Human Behavior, 59*, 155–164. <https://doi.org/10.1016/j.chb.2016.01.026>
- McKinley, N. M., & Hyde, J. S. (1996). The objectified body consciousness scale: Development and validation. *Psychology of Women Quarterly, 20*(2), 181–215. <https://doi.org/10.1111/j.1471-6402.1996.tb00467.x>
- McLean, S. A., Paxton, S. J., & Wertheim, E. H. (2016). Does media literacy mitigate risk for reduced body satisfaction following exposure to thin-ideal media? *Journal of Youth and Adolescence, 45*(8), 1678–1695. <https://doi.org/10.1007/s10964-016-0440-3>
- Medienpädagogischer Forschungsverbund Südwest. (2019). *JIM-Studie 2019: Jugend, Information, Medien*. <https://www.mpfs.de/studien/jim-studie/2019/>
- Meier, E. P., & Gray, J. (2014). Facebook photo activity associated with body image disturbance in adolescent girls. *Cyberpsychology, Behavior and Social Networking, 17*(4), 199–206. <https://doi.org/10.1089/cyber.2013.0305>
- Mercurio, A. E., & Landry, L. J. (2008). Self-objectification and well-being: The impact of self-objectification on women's overall sense of self-worth and life satisfaction. *Sex Roles, 58*(7-8), 458–466. <https://doi.org/10.1007/s11199-007-9357-3>
- Messineo, M. J. (2008). Does advertising on Black entertainment television portray more positive gender representations compared to broadcast networks? *Sex Roles, 59*(9-10), 752–764. <https://doi.org/10.1007/s11199-008-9470-y>

- Michaels, M. S., Parent, M. C., & Moradi, B. (2013). Does exposure to muscularity-idealizing images have self-objectification consequences for heterosexual and sexual minority men? *Psychology of Men & Masculinity*, *14*(2), 175–183. <https://doi.org/10.1037/a0027259>
- Mingoia, J., Hutchinson, A. D., Wilson, C., & Gleaves, D. H. (2017). The relationship between social networking site use and the internalization of a thin ideal in females: A meta-analytic review. *Frontiers in Psychology*, *8*, 1351. <https://doi.org/10.3389/fpsyg.2017.01351>
- Mischner, I. H. S., van Schie, H. T., Wigboldus, D. H. J., van Baaren, R. B., & Engels, R. C. M. E. (2013). Thinking big: The effect of sexually objectifying music videos on bodily self-perception in young women. *Body Image*, *10*(1), 26–34. <https://doi.org/10.1016/j.bodyim.2012.08.004>
- Moradi, B. (2010). Addressing gender and cultural diversity in body image: Objectification theory as a framework for integrating theories and grounding research. *Sex Roles*, *63*(1-2), 138–148. <https://doi.org/10.1007/s11199-010-9824-0>
- Moradi, B. (2011). Objectification theory: Areas of promise and refinement. *The Counseling Psychologist*, *39*(1), 153–163. <https://doi.org/10.1177/0011000010384279>
- Moradi, B., & Huang, Y.-P. (2008). Objectification theory and psychology of women: A decade of advances and future directions. *Psychology of Women Quarterly*, *32*(4), 377–398. <https://doi.org/10.1111/j.1471-6402.2008.00452.x>
- Morry, M. M., & Staska, S. L. (2001). Magazine exposure: Internalization, self-objectification, eating attitudes, and body satisfaction in male and female university students. *Canadian Journal of Behavioural Science / Revue Canadienne Des Sciences Du Comportement*, *33*(4), 269–279. <https://doi.org/10.1037/h0087148>
- Mulgrew, K. E., Volcevski-Kostas, D., & Rendell, P. G. (2014). The effect of music video clips on adolescent boys' body image, mood, and schema activation. *Journal of Youth and Adolescence*, *43*(1), 92–103. <https://doi.org/10.1007/s10964-013-9932-6>
- Nederhof, A. J. (1985). Methods of coping with social desirability bias: A review. *European Journal of Social Psychology*, *15*(3), 263–280. <https://doi.org/10.1002/ejsp.2420150303>
- Noll, S. M., & Fredrickson, B. L. (1998). A mediational model linking self-objectification, body shame, and disordered eating. *Psychology of Women Quarterly*, *22*(4), 623–636. <https://doi.org/10.1111/j.1471-6402.1998.tb00181.x>

- Peat, C. M., & Muehlenkamp, J. J. (2011). Self-objectification, disordered eating, and depression: A test of mediational pathways. *Psychology of Women Quarterly*, 35(3), 441–450. <https://doi.org/10.1177/0361684311400389>
- Pennell, H., & Behm-Morawitz, E. (2015). The empowering (super) heroine? The effects of sexualized female characters in superhero films on women. *Sex Roles*, 72(5-6), 211–220. <https://doi.org/10.1007/s11199-015-0455-3>
- Perloff, R. M. (2014). Social media effects on young women's body image concerns: Theoretical perspectives and an agenda for research. *Sex Roles*, 71(11-12), 363–377. <https://doi.org/10.1007/s11199-014-0384-6>
- Pew Research Center. (2018). *Teens, social media & technology 2018*. http://www.pewinternet.org/wp-content/uploads/sites/9/2018/05/PI_2018.05.31_TeensTech_FINAL.pdf
- Pope, H. G., Olivardia, R., Borowiecki, J. J., & Cohane, G. H. (2001). The growing commercial value of the male body: A longitudinal survey of advertising in women's magazines. *Psychotherapy and Psychosomatics*, 70(4), 189–192. <https://doi.org/10.1159/000056252>
- Prichard, I., McLachlan, A. C., Lavis, T., & Tiggemann, M. (2017). The impact of different forms of #fitspiration imagery on body image, mood, and self-objectification among young women. *Sex Roles*, 17(3), 10. <https://doi.org/10.1007/s11199-017-0830-3>
- Prichard, I., & Tiggemann, M. (2005). Objectification in fitness centers: Self-objectification, body dissatisfaction, and disordered eating in aerobic instructors and aerobic participants. *Sex Roles*, 53(1-2), 19–28. <https://doi.org/10.1007/s11199-005-4270-0>
- Prichard, I., & Tiggemann, M. (2008). Relations among exercise type, self-objectification, and body image in the fitness centre environment: The role of reasons for exercise. *Psychology of Sport and Exercise*, 9(6), 855–866. <https://doi.org/10.1016/j.psychsport.2007.10.005>
- Prieler, M., & Centeno, D. (2013). Gender representation in Philippine television advertisements. *Sex Roles*, 69(5-6), 276–288. <https://doi.org/10.1007/s11199-013-0301-4>
- Quinn, D. M., Chaudoir, S. R., & Kallen, R. W. (2011). Performance and flow: A review and integration of self-objectification research. In R. M. Calogero, S. Tantleff-Dunn, & J. K. Thompson (Eds.), *Self-objectification in women: Causes, consequences, and counteractions* (pp. 119–138). American Psychological Association. <https://doi.org/10.1037/12304-006>

- Randazzo, R., Farmer, K., & Lamb, S. (2015). Queer women's perspectives on sexualization of women in media. *Journal of Bisexuality*, 15(1), 99–129. <https://doi.org/10.1080/15299716.2014.986315>
- Read, G. L., Lynch, T., & Matthews, N. L. (2018). Increased cognitive load during video game play reduces rape myth acceptance and hostile sexism after exposure to sexualized female avatars. *Sex Roles*, 5(4), 279. <https://doi.org/10.1007/s11199-018-0905-9>
- Reichert, T., Latour, M. S., Lambiase, J. J., & Adkins, M. (2007). A test of media literacy effects and sexual objectification in advertising. *Journal of Current Issues & Research in Advertising*, 29(1), 81–92. <https://doi.org/10.1080/10641734.2007.10505210>
- Schaefer, L. M., Harriger, J. A., Heinberg, L. J., Soderberg, T., & Kevin Thompson, J. (2017). Development and validation of the sociocultural attitudes towards appearance questionnaire-4-revised (SATAQ-4R). *The International Journal of Eating Disorders*, 50(2), 104–117. <https://doi.org/10.1002/eat.22590>
- Schaefer, L. M., & Thompson, J. K. (2018). Self-objectification and disordered eating: A meta-analysis. *The International Journal of Eating Disorders*, 51(6), 483–502. <https://doi.org/10.1002/eat.22854>
- Sevic, S., Ciprić, A., Buško, V., & Štulhofer, A. (2020). The relationship between the use of social networking sites and sexually explicit material, the internalization of appearance ideals and body self-surveillance: Results from a longitudinal study of male adolescents. *Journal of Youth and Adolescence*, 49(2), 383–398. <https://doi.org/10.1007/s10964-019-01172-2>
- Sharp, G., Tiggemann, M., & Matiske, J. (2014). The role of media and peer influences in Australian women's attitudes towards cosmetic surgery. *Body Image*, 11(4), 482–487. <https://doi.org/10.1016/j.bodyim.2014.07.009>
- Slater, A., & Tiggemann, M. (2010). Body image and disordered eating in adolescent girls and boys: A test of objectification theory. *Sex Roles*, 63(1), 42–49. <https://doi.org/10.1007/s11199-010-9794-2>
- Slater, A., & Tiggemann, M. (2016). Little girls in a grown up world: Exposure to sexualized media, internalization of sexualization messages, and body image in 6-9 year-old girls. *Body Image*, 18, 19–22. <https://doi.org/10.1016/j.bodyim.2016.04.004>
- Slevec, J., & Tiggemann, M. (2010). Attitudes toward cosmetic surgery in middle-aged women: Body image, aging anxiety, and the media. *Psychology of Women Quarterly*, 34(1), 65–74. <https://doi.org/10.1111/j.1471-6402.2009.01542.x>

- Slevec, J., & Tiggemann, M. (2011). Media exposure, body dissatisfaction, and disordered eating in middle-aged women. *Psychology of Women Quarterly*, 35(4), 617–627. <https://doi.org/10.1177/0361684311420249>
- Smith, L. R. (2016). What's the best exposure? Examining media representations of female athletes and the impact on collegiate athletes' self-objectification. *Communication & Sport*, 4(3), 282–302. <https://doi.org/10.1177/2167479515577080>
- Smith, S. L., Choueiti, M., Prescott, A., & Pieper, K. (2012). *Gender roles & occupations: A look at character attributes and job-related aspirations in film and television*. Geena Davis Institute on Gender in Media. <https://seejane.org/wp-content/uploads/full-study-gender-roles-and-occupations-v2.pdf>
- Stamatakis, E., Hillsdon, M., Mishra, G., Hamer, M., & Marmot, M. (2009). Television viewing and other screen-based entertainment in relation to multiple socioeconomic status indicators and area deprivation: The Scottish Health Survey 2003. *Journal of Epidemiology and Community Health*, 63(9), 734–740. <https://doi.org/10.1136/jech.2008.085902>
- Stankiewicz, J. M., & Rosselli, F. (2008). Women as sex objects and victims in print advertisements. *Sex Roles*, 58(7-8), 579–589. <https://doi.org/10.1007/s11199-007-9359-1>
- Strahan, E. J., Lafrance, A., Wilson, A. E., Ethier, N., Spencer, S. J., & Zanna, M. P. (2008). Victoria's dirty secret: How sociocultural norms influence adolescent girls and women. *Personality & Social Psychology Bulletin*, 34(2), 288–301. <https://doi.org/10.1177/0146167207310457>
- Strelan, P., & Hargreaves, D. (2005). Reasons for exercise and body esteem: Men's responses to self-objectification. *Sex Roles*, 53(7-8), 495–503. <https://doi.org/10.1007/s11199-005-7137-5>
- Swim, J. K., Hyers, L. L., Cohen, L. L., & Ferguson, M. J. (2001). Everyday sexism: Evidence for its incidence, nature, and psychological impact from three daily diary studies. *Journal of Social Issues*, 57(1), 31–53. <https://doi.org/10.1111/0022-4537.00200>
- Szymanski, D. M., & Henning, S. L. (2007). The role of self-objectification in women's depression: A test of objectification theory. *Sex Roles*, 56(1-2), 45–53. <https://doi.org/10.1007/s11199-006-9147-3>
- Thompson, J. K., Heinberg, L. J., Altabe, M., & Tantleff-Dunn, S. (1999). *Exacting beauty: Theory, assessment, and treatment of body image disturbance*. American Psychological Association. <https://doi.org/10.1037/10312-000>

- Thompson, J. K., van den Berg, P., Roehrig, M., Guarda, A. S., & Heinberg, L. J. (2004). The sociocultural attitudes towards appearance scale-3 (SATAQ-3): Development and validation. *The International Journal of Eating Disorders*, *35*(3), 293–304. <https://doi.org/10.1002/eat.10257>
- Tiggemann, M. (2011). Mental health risks of self-objectification: A review of the empirical evidence for disordered eating, depressed mood, and sexual dysfunction. In R. M. Calogero, S. Tantleff-Dunn, & J. K. Thompson (Eds.), *Self-objectification in women: Causes, consequences, and counteractions* (pp. 139–159). American Psychological Association. <https://doi.org/10.1037/12304-007>
- Tiggemann, M., & Slater, A. (2014). NetTweens: The internet and body image concerns in preteenage girls. *The Journal of Early Adolescence*, *34*(5), 606–620. <https://doi.org/10.1177/0272431613501083>
- Tiggemann, M., & Slater, A. (2015). The role of self-objectification in the mental health of early adolescent girls: Predictors and consequences. *Journal of Pediatric Psychology*, *40*(7), 704–711. <https://doi.org/10.1093/jpepsy/jsv021>
- Tiggemann, M., & Williams, E. (2011). The role of self-objectification in disordered eating, depressed mood, and sexual functioning among women. *Psychology of Women Quarterly*, *36*(1), 66–75. <https://doi.org/10.1177/0361684311420250>
- Tiggemann, M., & Zaccardo, M. (2015). "Exercise to be fit, not skinny": The effect of fitspiration imagery on women's body image. *Body Image*, *15*, 61–67. <https://doi.org/10.1016/j.bodyim.2015.06.003>
- Tiggemann, M., & Zaccardo, M. (2018). 'Strong is the new skinny': A content analysis of #fitspiration images on Instagram. *Journal of Health Psychology*, *23*(8), 1003–1011. <https://doi.org/10.1177/1359105316639436>
- Trekels, J., Eggermont, S., Koppen, E., & Vandenbosch, L. (2018). Beauty ideals from reality television and young women's tanning behavior: An internalization and self-objectification perspective. *Communication Quarterly*, *66*(3), 325–343. <https://doi.org/10.1080/01463373.2017.1381627>
- Turkay, S., & Kinzer, C. K. (2014). The effects of avatar-based customization on player identification. *International Journal of Gaming and Computer-Mediated Simulations (IJGCMS)*, *6*(1), 1–25.
- Twenge, J. M., Martin, G. N., & Spitzberg, B. H. (2019). Trends in U.S. adolescents' media use, 1976–2016: The rise of digital media, the decline of TV, and the (near) demise of

- print. *Psychology of Popular Media Culture*, 8(4), 329–345. <https://doi.org/10.1037/ppm0000203>
- Vandenbosch, L., Driesmans, K., Trekels, J., & Eggermont, S. (2017). Sexualized video game avatars and self-objectification in adolescents: The role of gender congruency and activation frequency. *Media Psychology*, 20(2), 221–239. <https://doi.org/10.1080/15213269.2016.1142380>
- Vandenbosch, L., & Eggermont, S. (2012). Understanding sexual objectification: A comprehensive approach toward media exposure and girls' internalization of beauty ideals, self-objectification, and body surveillance. *Journal of Communication*, 62(5), 869–887. <https://doi.org/10.1111/j.1460-2466.2012.01667.x>
- Vandenbosch, L., & Eggermont, S. (2013). Sexualization of adolescent boys. *Men and Masculinities*, 16(3), 283–306. <https://doi.org/10.1177/1097184X13477866>
- Vandenbosch, L., & Eggermont, S. (2015). The role of mass media in adolescents' sexual behaviors: Exploring the explanatory value of the three-step self-objectification process. *Archives of Sexual Behavior*, 44(3), 729–742. <https://doi.org/10.1007/s10508-014-0292-4>
- Vandenbosch, L., & Eggermont, S. (2016). The interrelated roles of mass media and social media in adolescents' development of an objectified self-concept. *Communication Research*, 43(8), 1116–1140. <https://doi.org/10.1177/0093650215600488>
- Vandenbosch, L., Vervloessem, D., & Eggermont, S. (2013). “I might get your heart racing in my skin-tight jeans”: Sexualization on music entertainment television. *Communication Studies*, 64(2), 178–194. <https://doi.org/10.1080/10510974.2012.755640>
- Vangeel, L., Vandenbosch, L., & Eggermont, S. (2018). The multidimensional self-objectification process from adolescence to emerging adulthood. *Body Image*, 26, 60–69. <https://doi.org/10.1016/j.bodyim.2018.05.005>
- Verhellen, Y., Dens, N., & de Pelsmacker, P. (2016). A longitudinal content analysis of gender role portrayal in Belgian television advertising. *Journal of Marketing Communications*, 22(2), 170–188. <https://doi.org/10.1080/13527266.2013.871321>
- de Vries, D. A., Peter, J., de Graaf, H., & Nikken, P. (2016). Adolescents' social network site use, peer appearance-related feedback, and body dissatisfaction: Testing a mediation model. *Journal of Youth and Adolescence*, 45(1), 211–224. <https://doi.org/10.1007/s10964-015-0266-4>
- Wang, Y., Xie, X., Fardouly, J., Vartanian, L. R., & Lei, L. (2019). The longitudinal and reciprocal relationships between selfie-related behaviors and self-objectification and

- appearance concerns among adolescents. *New Media & Society*, 9, 1-22.
<https://doi.org/10.1177/1461444819894346>
- Ward, L. M. (2016). Media and sexualization: State of empirical research, 1995-2015. *Journal of Sex Research*, 53(4-5), 560–577. <https://doi.org/10.1080/00224499.2016.1142496>
- Welkenhuysen-Gybels, J., Billiet, J., & Cambré, B. (2003). Adjustment for acquiescence in the assessment of the construct equivalence of Likert-type score items. *Journal of Cross-Cultural Psychology*, 34(6), 702–722. <https://doi.org/10.1177/0022022103257070>
- Wiseman, M. C., & Moradi, B. (2010). Body image and eating disorder symptoms in sexual minority men: A test and extension of objectification theory. *Journal of Counseling Psychology*, 57(2), 154–166. <https://doi.org/10.1037/a0018937>
- Yamamiya, Y., Cash, T. F., Melnyk, S. E., Posavac, H. D., & Posavac, S. S. (2005). Women's exposure to thin-and-beautiful media images: Body image effects of media-ideal internalization and impact-reduction interventions. *Body Image*, 2(1), 74–80. <https://doi.org/10.1016/j.bodyim.2004.11.001>
- Yee, N., & Bailenson, J. N. (2007). The Proteus Effect: The effect of transformed self-representation on Behavior. *Human Communication Research*, 33(3), 271–290. <https://doi.org/10.1111/j.1468-2958.2007.00299.x>
- Yee, N., & Bailenson, J. N. (2009). The difference between being and seeing: The relative contribution of self-perception and priming to behavioral changes via digital self-representation. *Media Psychology*, 12(2), 195–209. <https://doi.org/10.1080/15213260902849943>

Erklärung

Hiermit versichere ich, die Dissertation „Sexualized Media and Self-Objectification in Women and Adolescents: A Multi-Method Approach“ selbstständig angefertigt zu haben. Die Arbeit wird zur Promotion im Fach Psychologie eingereicht und ist ohne unzulässige Hilfe Dritter verfasst worden. Bei der Abfassung wurden nur die in der Dissertation angegebenen Hilfsmittel benutzt sowie alle wörtlich oder inhaltlich übernommenen Stellen als solche gekennzeichnet. Die Dissertation ist in der gegenwärtigen oder einer anderen Fassung in keinem früheren Promotionsverfahren angenommen oder abgelehnt worden. Ich habe an keiner anderen Hochschule ein Promotionsverfahren eröffnet.

Potsdam, November 2020

Marika Skowronski