**Body Image Development and Sexual Satisfaction:
A Prospective Study from Adolescence to Adulthood**

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Abstract

The aim of the current study was to explore whether developmental trajectories of body satisfaction from adolescence to young adulthood predicted measures of sexual satisfaction in young adulthood, even when controlling for important covariates such as gender, weight development, relationship status, mental health, and frequency of sexual intercourse and masturbation. Data were collected from a population-based prospective cohort of Norwegian adolescents ($n = 2,587$) over a period of 13 years in four waves (1992, 1994, 1999, and 2005; mean age = 14.9 in 1992, 57.3% women). Latent growth curves were estimated for body satisfaction and Body Mass Index (BMI). Men reported higher sexual satisfaction, sexual activity, baseline body satisfaction, and BMI than women. The developmental trajectories revealed a slight increase in body satisfaction and BMI from adolescence to young adulthood in both genders. Moreover, structural equation models showed that baseline body satisfaction in both genders predicted sexual satisfaction as a young adult, independent of relationship status and frequency of sexual activity. Neither the development of BMI nor of body satisfaction predicted sexual satisfaction. The results elucidate the vital role of body satisfaction in sexual satisfaction in adults and the importance of addressing body dissatisfaction in childhood.

Despite a well-documented cross-sectional association between body satisfaction and sexual satisfaction (Byers & Rehman, 2014; Woertman & van den Brink, 2012), knowledge about developmental processes explaining variations in sexual satisfaction is lacking. The body is a salient visual stimulus in social interactions, and our appearance is a source for both self-evaluation and communication from an early age (Cash, 2011). The current study contributes to the literature by providing information about how body satisfaction prospectively predicts sexual satisfaction for both women and men. The role of factors that may be confounders of the body satisfaction-sexual satisfaction association are also examined. For this purpose, data from a large, representative 13-year longitudinal study encompassing adolescence and young adulthood were used.

The Relationship Between Sexual Satisfaction and Body Image

Sexual satisfaction is “an affective response arising from one’s subjective evaluation of the positive and negative dimensions associated with one’s sexual relationships” (Lawrance & Byers, 1995, p. 514). It encompasses satisfaction with several aspects of sexuality, such as frequency of sexual intercourse (Schmiedeberg, Huyer-May, Castiglioni, & Johnson, 2017), sexual variety (Frederick, Lever, Gillespie, & Garcia, 2017), and communication about sexuality (Byers, 2011; Frederick et al., 2017). Body image is an important aspect of adolescent social and emotional development (Grogan, 2017) and consists of many dimensions that may relate to sexual satisfaction, such as perception, attitudes, thoughts, and feelings towards one’s body, and its influence on behavior (Cash, 2011). This paper focuses on the attitudinal-evaluative core feature of body image, for example, satisfaction with the overall appearance of the body (Grogan, 2017; Wiederman, 2012).

Internalization of cultural appearance and media body ideals is the key psychological process that puts adolescents at greater risk for body dissatisfaction than others (Lawler &

Nixon, 2011; Rodgers, McLean, & Paxton, 2015). Wiederman (2012) suggests that body dissatisfaction may be associated with reduced sexual satisfaction in different ways, such as by leading to avoidance of sexual activity (Ackard, Kearney Cooke, & Peterson, 2000), by connecting negative cognitions and emotions like body shame to sexual experiences (Claudat & Warren, 2014), or by being a distracting or interfering factor during sexual activity (Carvalheira, Godinho, & Costa, 2017). Increased body self-consciousness and body surveillance, which may be a consequence of dissatisfaction with one's body, are central mechanisms for understanding the link between body and sexual satisfaction (Cash, Maikkula, & Yamamiya, 2004; Claudat & Warren, 2014; Fredrickson & Roberts, 1997; Moradi, 2010).

Not only do women tend to be more dissatisfied with their bodies and appearance than men (Tiggemann & Sleviec, 2012) but research has additionally found gender differences in the salience of appearance (Moss & Rosser, 2012). Especially in Western cultures and among those with heterosexual orientation, women's attractiveness as sexual partners seems to depend to a greater degree on their appearance than is the case for men (Grogan, 2017; Rhodes, Simmons, & Peters, 2005). Objectification theory has often been used as a framework to explain variations in female body satisfaction and the psychological and experiential consequences (Calogero, 2012; Fredrickson & Roberts, 1997). The theory posits that women are being socialized to internalize gender-stereotyped body ideals, often through idealized and sexualized images in the media and interpersonal experiences, which may lead to self-objectification. Empirical studies have shown that self-objectification, which may lead to heightened body surveillance, body shame, and appearance anxiety, is associated with an increased risk of sexual avoidance, sexual dysfunctions, lower sexual self-esteem, and less sexual satisfaction (Aubrey, 2007; Calogero & Thompson, 2009; Claudat & Warren, 2014; Moradi, 2010; Sanchez & Kiefer, 2007; Satinsky, Reece, Dennis, Sanders, & Bardzell, 2012;

Steer & Tiggemann, 2008).

Although body dissatisfaction is more common among women, recent research has reported increasing levels in men (Frederick, Sandhu, Morse, & Swami, 2016; van den Brink et al., 2018). Owing to heightened media focus on the appearance of the male body (Parent, Schwartz, & Bradstreet, 2016), objectification theory has been extended to include men's experiences as well, but the empirical support for whether self-objectification plays a role in body dissatisfaction and body surveillance in men is mixed (Calogero, 2012; Hallsworth, Wade, & Tiggemann, 2005; Parent et al., 2016). A possible explanation put forward by Parent et al. (2016) is that women and men receive different messages regarding ideal bodies, where body ideals for men are more focused on body function, such as strength and power. Empirical studies provide partial support for such gender differences. While body satisfaction is often reported to play a role in sexual behavior, functioning, and satisfaction in women, the research findings for men have been more diverse (Daniel & Bridges, 2013; Woertman & van den Brink, 2012). However, some cross-sectional studies indicate that body satisfaction might be as important for sexual satisfaction for men as it is for women (Holt & Lyness, 2007; Milhausen, Buchholz, Opperman, & Benson, 2014; Træen, Markovic, & Kvalem, 2016). Longitudinal studies examining the role of gender are still scarce, and gender differences in the role of body satisfaction in sexual satisfaction are far from being clearly delineated.

Body Satisfaction Development

When examining the role of body satisfaction in sexual satisfaction, the potential importance of developmental changes in the relationship should be considered. First, appearance may be more important in some developmental phases than in others.

Adolescence has been proposed as an especially significant period as the combination of puberty, increased self-focus and social comparison, and changing social relationships makes body image particularly vulnerable during that time (Arnett, 2000; Grogan, 2017). Such a

notion has been supported by longitudinal studies finding increased body dissatisfaction over adolescence (Calzo, Corliss, Blood, Field, & Austin, 2013; Yu, 2016) and across young adulthood, often explained by an increase in body weight (Bucchianeri, Arikian, Hannan, Eisenberg, & Neumark-Sztainer, 2013). Yet other large longitudinal studies have shown that while body satisfaction was at its lowest in the adolescent period, it became more positive and remained relatively stable in young adulthood (Frisén, Lunde, & Berg, 2015; Holsen, Carlson Jones, & Skogbrott Birkeland, 2012; Morin, Maïano, Marsh, Janosz, & Nagengast, 2011; von Soest, Wichstrøm, & Kvaalem, 2016).

Moreover, in adolescence and emerging adulthood, body satisfaction is an important aspect of romantic relationships (Carlson Jones, 2011; Goins, Markey, & Gillen, 2012) and sexual self-concept (Aubrey, 2007). In a longitudinal study, Seiffge-Krenke, Persike, and Schulman (2015) found that adolescent body satisfaction predicted romantic attachment as a young adult, suggesting that a positive body evaluation in adolescence can increase the confidence to become involved in later intimate relationships. The interplay between body satisfaction development and sexual experiences through emerging adulthood may have implications for future sexuality and relationships. For example, appearance-related comments from a romantic partner have been shown to impact both body satisfaction and sexual well-being in men and women (Goldsmith & Byers, 2016; Weaver & Byers, 2018). It is, therefore, of interest to examine the role and development of body satisfaction in adolescence and onward for sexual satisfaction later in life.

Other Predictors of Sexual Satisfaction

Undoubtedly, body satisfaction is not the only psychosocial variable of importance for sexual satisfaction. Relationship status and sexual activity factors may be confounders of a body satisfaction-sexual satisfaction association, and their inclusion in the study design is vital.

First, being in a romantic relationship has been associated with sexual satisfaction in several studies (Byers & Rehman, 2014). For example, Pedersen and Blekesaune (2003) found that young adults who were married or in committed relationships reported higher sexual satisfaction, adjusted for frequency of sexual activity and mental health factors, compared to an unattached group. Body satisfaction may also differ in relation to relationship status. Blodgett Salafia and Benson (2013) found that women who were not dating had lower body satisfaction and more body self-consciousness compared to women who were dating. Other studies have also reported less body self-consciousness during sexual activity within partnered relationships than among single men and women (Meana & Nunnink, 2006; Sanchez & Kiefer, 2007).

Second, the frequency of sexual activity is of importance. There is solid evidence for a relationship between higher frequency of intercourse and sexual satisfaction for both men and women (Costa & Brody, 2012; McNulty, Wenner, & Fisher, 2016). Sexual intercourse is more frequent in partnered relationships, and intercourse frequency has, in some instances, been viewed as a proxy for relationship satisfaction (McNulty et al., 2016). Body satisfaction in women has mostly been studied in relation to sexual activity in general without specifying intercourse frequency (Woertman & van den Brink, 2012). A study by Trapnell, Meston, and Gorzalka (1997) found that body dissatisfaction predicted lower intercourse frequency, but research on intercourse activity in relation to body image is sparse.

Sexual intercourse is not the only sexual behavior that may influence sexual satisfaction. Although masturbation frequency decreases somewhat in steady relationships, it continues to be a part of sexual expression (Hurlbert & Whittaker, 1991). Masturbation has been associated with sexual satisfaction in both men and women by functioning as either a complement to sex in a relationship (Coleman, 2003; Das, 2007) or compensation for lack of sex or satisfaction with partnered sex (Das, 2007). For women, masturbation has been linked

to body satisfaction by suggesting that it may be a way to explore the body and increase comfort, thus giving women a possibility to learn what is sexually pleasurable (Bowman, 2013; Coleman, 2003). For example, Shulman and Horne (2003) found an association between higher masturbation frequency and body satisfaction in European American but not African American women. There is still a lack of research on the association between masturbation frequency and body satisfaction in men.

Third, mental health may be an important confounder of the relationship between sexual and body satisfaction. Research has consistently shown that mental health problems, such as depression and anxiety, are both related to reduced sexual functioning and to relationship factors that are detrimental to sexual satisfaction (Sanchez-Fuentes, Santos-Iglesias, & Sierra, 2014). Moreover, negative body image in early adolescence has been shown to be prospectively related to mental health problems such as depressive symptoms (Greenberg, Delinsky, Reese, Buhlmann, & Wilhelm, 2010; Siegel, 2002). A potential association between sexual and body satisfaction may thus be partly due to the detrimental effects of mental health problems on both sexual and body satisfaction. Interestingly, a recent study reported stronger associations between body dissatisfaction and mental health problems for men compared to women, proposing that it could be more stigmatizing for men to experience body dissatisfaction (Griffiths et al., 2016). Studies including mental health factors when examining body and sexual satisfaction should, therefore, take into account potential gender differences in the associations.

Finally, body weight is related to both appearance and sexual factors. It is well documented that being overweight is associated with body dissatisfaction in both men and women, and, as body weight increases from adolescence to adulthood, it can reasonably be expected to influence body satisfaction development (Bucchianeri et al., 2013). However, an increase in Body Mass Index (BMI) in young male adults can be a consequence of an increase

in muscle mass, which may influence body evaluation in the opposite direction (Calzo et al., 2013; Dion et al., 2015). Apart from an effect on body satisfaction, high BMI has been associated with sexually avoidant behavior, lower interest in sex, and limited sexual experience (Castellini et al., 2010; Smith et al., 2012). However, the association between BMI and sexual satisfaction is less clear (Smith et al., 2012). It is thus important to analyze the contribution of body weight development in the relationship between body and sexual satisfaction (Satinsky et al., 2012).

The Current Study

The primary aim of this paper was to examine the relationship between the development of body satisfaction across adolescence and young adulthood and sexual satisfaction in young adulthood for women and men. Moreover, we aimed to examine whether associations between body and sexual satisfaction remain when accounting for important potential covariates, such as changes in body weight, relationship status, mental health, and frequency of sexual intercourse and masturbation.

Methods

Participants and Procedure

Data from the longitudinal “Young in Norway” study (Wichstrøm, von Soest, & Kvaalem, 2013), which is a representative population-based study of Norwegian adolescents, were used. The data were collected at four different points in time: 1992 (T1), 1994 (T2), 1999 (T3), and 2005 (T4). In 1992, a large sample of students ($N = 12,287$, mean age = 14.9 years) was chosen from 67 secondary schools in Norway. All respondents completed a questionnaire at school under teacher supervision. The response rate was 97%. In 1994, 63 of the 67 schools were found suitable for a follow-up study. Those students who had left the school they had attended at T1 received the questionnaire by mail. Students who attended the same school at T2 completed the questionnaire following a similar procedure as at T1. The

response rate in 1994 totaled 78.9% ($n = 7,751$, mean age = 16.5 years). Only students who completed the questionnaire at school at T2 ($n = 3,844$) were followed up at T3 (1999) because of a comparatively lower response rate among those receiving the questionnaire by mail (68%). As it was originally planned as a two-wave study, informed consent had to be obtained again at T2. Those consenting at that juncture ($n = 3,507$; 91.2%), received the questionnaire by mail at T3 and T4. At T3, data were received from 2,923 participants (84.0%, mean age = 22.1 years), and, at T4 in 2005, the response rate was 82.0% ($n = 2,890$, mean age = 28.3 years).

All who participated at T4 were included ($N = 2,890$). Moreover, 303 participants were excluded either because they chose the response category “*Have not had any sexual partner*” on the sexual satisfaction measure ($n = 219$; see detailed description under Measures) or had missing responses to questions concerning sexual satisfaction ($n = 84$). As a result, data from 2,587 participants—1,105 men (42.7%) and 1,482 women (57.3%)—were used in the analyses. The mean age was 28.1 ($SD = 1.7$; Range 25–33), 81.6% were in a relationship (married, cohabiting, or with a steady partner), and 36.8% had children.

A multivariate logistic regression with T1 variables predicting non-participation at T2, T3, or T4 showed that older age was predictive, odds ratio (OR) = 1.27, 95% CI [1.23, 1.31], as were being male, OR = 1.44, 95% CI [1.28, 1.60], having had sexual intercourse, OR = 1.30, 95% CI [1.13, 1.50], and lower body satisfaction, OR = 0.92, 95% CI [0.84, 0.99].

The study was approved by the Regional Ethical Committee for Health Research and the Norwegian Data Inspectorate.

Measures

Sexual satisfaction was only measured at T4. The respondents were asked “During the last six months, how satisfied have you been with...»: “your capacity to let go during sex,” “your capacity of feeling sexual desire,” and “the quality of your sex life.” The response

categories were (1) *Clearly unsatisfactory*, (2) *Slightly unsatisfactory*, (3) *Satisfactory*, (4) *Very good*, (5) *Could not have been better*, and (6) *Have not had a sex partner*. Those who selected the final category were excluded from the analysis since no score on sexual satisfaction could be calculated. Mean scores across all three items were calculated; high values indicate a higher degree of sexual satisfaction with different aspects of one's sexuality. Cronbach's alpha was .84.

Body satisfaction was measured at all points with the Physical Appearance subscale of the revised version of the Self-Perception Profile for Adolescents (Harter, 1988; Wichstrøm, 1995). The scale consists of five items: "I am not satisfied with my appearance," "I wish my body was different," "I wish I looked different," "I think I look good," and "I like my appearance very much." Each item was evaluated on a scale from (1) *Does not correspond at all* to (4) *Corresponds very well*. A high mean score indicates high body satisfaction (Cronbach's alpha was .86, .89, .90, and .90 at T1, T2, T3, and T4, respectively).

BMI was based on self-reported weight and height at all four points, calculated by the formula $BMI = kg/h^2$.

Frequency of sexual activity was assessed at T4 by two questions about the frequency of the following sexual activities during the last six months: "Masturbation (of yourself)" and "Intercourse, oral sex, and similar." Responses ranged from (1) *Never* to (6) *Once a day or more*.

Relationship status was categorized as (1) Married/cohabiting/committed relationship and (0) Single.

Mental health was assessed by a validated 12-item short version of the Symptom Checklist, SCL-90, measuring anxiety and depressive symptoms (Derogatis, 1977; Heyerdahl, Kvammen, & Wichstrøm, 2003; Wichstrøm, 1995). Using a four-point response scale ranging from "not distressed" to "extremely distressed," respondents were asked to indicate to what

extent, over the last week, they had been bothered by the problems listed. Cronbach's alpha at T4 was .89.

Data Analyses

T-tests were used to analyze gender and relationship status differences in sexual satisfaction. Correlation analyses were performed to examine the associations between study variables. Developmental trajectories of body satisfaction and BMI were modeled by means of latent growth curves in the framework of structural equation modeling (Bollen & Curran, 2006). More specifically, latent growth curve models were constructed for body satisfaction and BMI. The parameterization of the growth factors was coded as the number of years that had passed after the first measurement (T1: 0; T2: 2; T3: 7; T4: 13), thus reflecting the uneven time intervals between measurements. Linear and non-linear trajectories were tested by including linear and quadratic slope factors in growth curve models. We thus estimated three parameters in the most complex growth curves: the intercept, representing estimated baseline levels of body image and BMI at T1; the slope, representing linear change; and the quadratic slope, representing quadratic change. Gender differences in trajectories were examined with conditional growth curve models by regressing growth factors (i.e., intercept, slope, and quadratic growth factor) on gender. Other time-invariant covariates were included in the model in similar ways. Continuous time-invariant covariates were mean-centered.

The associations of baseline level and development of body image and BMI with sexual satisfaction were examined by regressing sexual satisfaction on the intercept and growth factors of body image and BMI. Model fit was evaluated by inspecting χ^2 statistics, confirmatory fit index (CFI), Tucker-Lewis Index (TLI), and root mean square error of approximation (RMSEA). According to recommendations in the literature, CFI and TLI values of .95 or greater and RMSEA values of .06 or lower were considered to indicate a good fit (Hu & Bentler, 1999). A robust maximum likelihood estimator was used to handle

potential deviations from normality. Full information maximum likelihood estimation procedures were used, providing missing data routines considered adequate (Preacher, Wichman, MacCallum, & Briggs, 2008; Schafer & Graham, 2002). The statistical program Mplus 7.3 was used for all analyses (Muthén & Muthén, 2012).

Results

Table 1 presents descriptive statistics for all variables included in the study. Compared to women, men reported a higher degree of sexual satisfaction ($p < .001$), higher masturbation frequency ($p < .001$), lower scores on anxiety and depression symptoms ($p < .001$), and slightly higher sexual intercourse frequency during the last six months ($p < .05$). Men had higher baseline body satisfaction ($p < .001$) and BMI ($p < .001$) than women. The group that was currently married or had a cohabiting/steady partner reported higher sexual satisfaction ($p < .001$), less anxiety and depression symptoms ($p < .001$), higher age ($p < .001$), higher sexual intercourse frequency ($p < .001$), and lower masturbation frequency ($p < .001$) compared to those who were single. The two groups did not differ regarding BMI and body satisfaction.

Table 2 displays the correlations between all the study variables separately for women and men. Sexual satisfaction in adulthood was correlated with higher frequency of intercourse for both women ($r = .46, p < .001$) and men ($r = .50, p < .001$), had a small positive correlation with masturbation frequency (Women [W]: $r = .16, p < .001$; Men [M]: $r = .25, p < .001$), and had a small negative association with anxiety and depression symptoms (W: $r = -.19, p < .001$; M: $r = -.18, p < .001$). It is of interest that while there was a positive association between intercourse and masturbation frequency for women ($r = .16, p < .001$), there was no significant association for men ($r = -.04$). Baseline body satisfaction had a small but significant correlation with sexual satisfaction for women ($r = .06, p < .05$) and a somewhat higher correlation for men ($r = .14, p < .001$). Neither baseline BMI nor developmental trajectories of BMI and body satisfaction were correlated with sexual satisfaction. Although

not shown in the table, we also found a correlation between body satisfaction in adolescence and as an adult 13 years later (W: $r = .35, p < .001$; M: $r = .41, p < .001$). There was a cross-sectional positive correlation for both women and men between adult body satisfaction (at T4) and sexual satisfaction (W: $r = .17, p < .001$; M: $r = .27, p < .001$) but not between adult BMI and sexual satisfaction (W: $r = -.02, p < .59$; M: $r = .02, p < .58$).

Next, latent growth curves were estimated separately for body image and BMI. Concerning body image, a growth model including a quadratic slope showed good fit; $\chi^2(1) = 0.76$, CFI = 1.00, TLI = 1.00, RMSEA = .000. The mean intercept (baseline) was 2.59, whereas linear and quadratic slope values were 0.35 and -0.15 , respectively. Fit indices for the quadratic model were substantially better than for a growth model where only a linear slope was estimated; $\chi^2(5) = 89.28$, CFI = 0.97, TLI = 0.96, RMSEA = .081. Likewise, a quadratic growth model provided substantially better fit than a linear model when modeling the development of BMI: quadratic model: $\chi^2(1) = 0.93$, CFI = 1.00, TLI = 1.01, RMSEA = .000; linear model: $\chi^2(5) = 76.46$, CFI = 0.13, TLI = 0.04., RMSEA = .074. Mean growth parameters for the quadratic growth model were estimated to be 20.02, 6.12, and -2.16 , respectively. We further examined whether growth trajectories differed for women and men. For this purpose, growth parameters were regressed on gender. Results of these analyses for body image showed significant gender differences in the intercept ($\beta = -.35, p < .001$) and the quadratic slope ($\beta = .10, p = .02$) but not in the linear slope ($\beta = -.04, p = .21$). Moreover, significant gender differences for all growth factors were found when examining trajectories of BMI ($\beta = -.08, p < .001$), linear slope ($\beta = -.31, p < .001$), and quadratic slope ($\beta = .22, p < .001$). Estimated trajectories for both genders and body image and BMI are graphically displayed in Figure 1. The results thus indicate that women's and men's developmental trajectories differ concerning both level and shape, thereby warranting further gender-specific analyses.

We then examined how all variables included in the study—including growth factors for body image and BMI—were related to sexual satisfaction. More specifically, we included variables from one domain together as predictors of sexual satisfaction, controlling for age (see Table 3, first two columns). In the next step, all variables were entered simultaneously (Table 3, last two columns). Analyses were conducted separately for men and women. Results from the blockwise regression analyses show that while baseline body satisfaction predicted sexual satisfaction for both men and women, the developmental trajectory of body satisfaction did not. In the case of BMI, neither the baseline value nor the trajectory was a significant predictor. Symptoms of anxiety and depression were negative predictors for both women and men. When entered separately, being in a partnered relationship was a stronger predictor of sexual satisfaction for men than it was for women. While intercourse frequency was an equally strong predictor of sexual satisfaction for both women and men, masturbation frequency emerged as a positive predictor for women but a negative predictor for men.

Baseline body satisfaction remained a significant predictor of sexual satisfaction when accounting for all other variables in the full model. The full model explained 26% of the variance in sexual satisfaction for women and 29% for men. Intercourse frequency was still the strongest predictor of sexual satisfaction for both men and women, followed by mental health, while masturbation frequency remained a significant partial predictor for women but not for men. Being in a partnered relationship was no longer a significant predictor of sexual satisfaction in men when the other variables were accounted for. Partner status functioned as a suppressor variable for women; when the effects of other predictors were controlled, it was a negative predictor of sexual satisfaction. On closer inspection it was found that the predictive value of partner status decreased because of the inclusion of the intercourse frequency variable in the full model.

Discussion

By using data from a large longitudinal population-based study, this study makes three key contributions to the research field. First, the results showed that baseline adolescent body satisfaction was related to measures of sexual satisfaction even when controlling for a number of relevant predictors, such as the frequency of sexual activity, mental health, and relationship status, for both women and men. As such, this study is one of the first to provide evidence of a prospective association between adolescent body satisfaction and adult sexual satisfaction. Second, the development of body satisfaction in adolescence and onward was not associated with sexual satisfaction as a young adult, and neither were adolescent body weight and developmental trajectories of body weight. Third, the study provided support for a number of gender differences: as expected, men reported higher adult sexual satisfaction and sexual activity compared to women, which is in accordance with research (Byers & Rehman, 2014; Sanchez-Fuentes et al., 2014). The observed gender difference in body satisfaction is also a common finding in body image research (Cash, 2011; Grogan, 2017). The new finding is that the prospective association between adolescent body image and adult sexual satisfaction was somewhat stronger for men than for women.

Although it is not possible to make causal interpretations from these data, our finding indicates that body satisfaction in adolescence, when most people will not have had extensive sexual experience, may be a source of variation in adult sexual satisfaction. Body dissatisfaction appears in childhood and remains fairly stable in early adolescence (Grogan, 2017; Wertheim & Paxton, 2011). The observed relationship between adolescent body satisfaction and adult sexual satisfaction might be an indication of an early-established body image schema, which, according to Cash (2011, p. 43), reflects “one’s core affect-laden assumptions or beliefs about the importance and influence of one’s appearance in life.” A positive body image is strongly associated with a positive self-concept, and the close

association remains stable from adolescence to adulthood, which signifies the sociocultural importance of appearance (von Soest et al., 2016).

Another possible explanation for our finding may stem from the importance of attraction and appearance in the formation of interpersonal relationships (Anthony, Holmes, & Wood, 2007). If body satisfaction is reciprocally associated with sexual experiences throughout adolescence, this interaction may keep the relation between the level of body and sexual satisfaction relatively stable. For example, not only do physically attractive people have (social) advantages but having the *belief* that one is attractive also fosters social confidence and skills (Cash, 1990). To view oneself as attractive may result in greater confidence when interacting with potential partners at the same time as greater sexual interest shown by potential and actual sexual partners reinforces the early established level of body satisfaction (Nezlek, 1999). For example, cross-sectional studies have documented a relationship between negative body evaluation and less frequent sexual intercourse (Trapnell et al., 1997) and, generally, less sexual experience (Woertman & van den Brink, 2012).

Our study found that the developmental trajectory of body satisfaction did not predict adult sexual satisfaction for either women or men. To our knowledge, this is the first study to examine the development of body satisfaction in relation to sexual satisfaction. The finding that body satisfaction develops in a relatively stable and slightly positive direction in emerging adulthood for both men and women has been reported in other longitudinal studies (Frisén et al., 2015; Holsen et al., 2012; Morin et al., 2011; von Soest et al., 2016). The result that adolescent body satisfaction, but not the developmental trajectory, predicted adult sexual satisfaction, highlights adolescence as the most significant period for establishing a body image schema that may prospectively affect sexual satisfaction. It is important to note that we studied the average trajectory of body satisfaction development, and future research should

examine how different developmental trajectories in body satisfaction may relate to sexual experiences and satisfaction.

Overall, baseline BMI and changes in BMI did not predict variation in adult sexual satisfaction, which supports cross-sectional findings of the limited role of BMI in sexual satisfaction (Smith et al., 2012). In line with previous studies, we found that mental health problems were a negative predictor of sexual satisfaction (Sanchez-Fuentes et al., 2014). However, the results showed that mental health was not a confounder of the relationship between baseline body and sexual satisfaction.

As expected, men reported both higher body and sexual satisfaction than women, but our findings indicate that adolescent body satisfaction in men was somewhat more closely related to adult sexual satisfaction than in women, independent of the current frequency of sexual activity and mental health. This result is in line with recent cross-sectional studies showing stronger relationships between body image and sexual satisfaction in men compared to women (Holt & Lyness, 2007; Milhausen et al., 2014; Træen et al., 2016). Body image is gendered, and it is reasonable to believe that the social meaning of body satisfaction within a sexual context will differ for men and women. A possible explanation for the observed gender difference in our study may be that men's body satisfaction is more closely related to sexual behavior and experiences than it is in women. Masculinity and the drive for muscularity are central aspects of body satisfaction (Parent et al., 2016), but are also linked to sexual assertiveness in men (Swami, Diwell, & McCreary, 2014). For example, a longitudinal study by Vasilenko, Ram, and Lefkowitz (2011) showed that men in late adolescence became more satisfied with their appearance after their first experience of sexual intercourse, while young women became slightly more dissatisfied. An explanation put forward by the authors was that the first intercourse experience validates men's sense of masculinity, and thus their satisfaction with their appearance. It is also plausible that sexually specific aspects of body

satisfaction are to a greater degree embedded in men's responses to general body satisfaction measures than they are in women. When using specific body satisfaction measures, van den Brink et al. (2018) found that dissatisfaction with genital appearance, but not with muscularity, body fat, and height, was associated with sexual dissatisfaction in young adult men.

Being in a partnered relationship predicted high sexual satisfaction in both women and men when not controlling for covariates. However, when all covariates were included in the model, the association changed substantially and the positive association between partnership status and sexual satisfaction diminished for both genders. Follow-up analyses showed that the changes in association were driven by including intercourse frequency as a covariate. Results thus indicate that those who are in steady relationships are more sexually satisfied because they more frequently have intercourse, which is strongly associated with sexual satisfaction. Interestingly, for women, not only did the positive association diminish when controlling for covariates but even a negative association between relationship status and sexual satisfaction emerged. Thus, when accounting for covariates—and particularly intercourse frequency—women without steady partners reported higher sexual satisfaction than women in partnered relationships. Possibly, women in steady relationships may to a larger degree than single women conform to their partners' sexual preferences or have different expectations (Muisse, Schimmack, & Impett, 2016; Pedersen & Bleksaune, 2003), thereby feeling less sexual satisfaction. In contrast, within the Nordic culture, with a more egalitarian and permissive view on adolescent and female sexuality (Lewin, 2008), single women may experience more sexual agency and control when having sex in a non-committed sexual partnership, thus leading to higher sexual satisfaction (McCabe, Tanner, & Heiman, 2010).

The strengths of this study are the longitudinal design, the large representative sample, and the high response rate. Most importantly, the 13-year prospective period spanned the important life course transition from adolescence to young adulthood. Despite these strengths, several limitations should also be considered when interpreting the results of this study. First, attrition may threaten generalizability in all longitudinal research because of selection bias. During the first data collection wave, the 97% response rate ensured high representativeness of the general population of adolescents. The group that dropped out after T1 had a higher probability of sexual intercourse debut and slightly higher body dissatisfaction. The data from the attrition group were not included in any of the analyses undertaken and it is possible that their developmental trajectory might have been different compared to the study group. However, state-of-the-art techniques were used to handle missing data adequately, thereby minimizing biases due to selective attrition.

Second, sexuality is a potentially sensitive issue, and questions on this subject might be embarrassing to some participants. Another important issue in sexuality research is social desirability, which may lead to exaggerated or censored responses on questions about sexual experiences. However, Lewin, Fugl-Meyer, Helmius, Lalos, and Månsson (2000) showed that people overlook these types of questions rather than answer them erroneously, and, when they do answer, they do so truthfully. The sexual satisfaction measure was adapted for the Young in Norway study, impeding the comparability of the results with other studies. Sexual satisfaction was only measured at the adult stage, which made it impossible to control for baseline sexual satisfaction. Finally, the body evaluation measure did not include satisfaction with muscularity, which may have decreased the validity and reliability of the measure for men, as the importance of being muscular may change with age (McCreary, 2012).

Conclusion

This longitudinal study makes an important contribution to the current knowledge about the relationship between body satisfaction development and sexual satisfaction. Baseline adolescent body satisfaction predicted measures of sexual satisfaction 13 years later, independent of BMI, frequency of sexual activity, mental health, relationship status, and the developmental trajectory of body satisfaction. Research on body image and sexual satisfaction has predominantly focused on women, while this study provides insight into the vital and consistent role of body satisfaction in men's sexual satisfaction. The aim of future research should be to examine possible mediators in the observed association between adolescent body satisfaction and sexual satisfaction as a young adult, especially in men. The findings underscore the significance of global, trait-level body satisfaction in sexual satisfaction, emphasizing the importance of early prevention of negative body image in childhood and adolescence.

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Table 1:

Gender and Relationship Status Differences in Sexual Satisfaction, Frequency of Intercourse and Masturbation, Mental Health, Baseline and Change in Body Satisfaction and BMI, and Age.

	Women (<i>n</i> = 1,482)		Men (<i>n</i> = 1,105)		Difference		Single (<i>n</i> = 476)		Married/ Partner (<i>n</i> = 2,111)		Difference	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>d</i>	<i>t</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>d</i>	<i>t</i>
Sexual satisfaction T4	3.16	0.97	3.54	0.79	.43	10.73***	3.12	0.87	3.37	0.92	.28	5.50***
Masturbation frequency T4	2.79	1.15	3.92	1.19	.96	24.16***	3.97	1.28	3.12	1.24	-.67	13.42***
Intercourse frequency T4	3.53	0.94	3.60	1.06	.07	2.12*	2.79	1.00	3.73	0.90	.99	19.93***
Symptoms of anxiety and depression T4	1.51	0.47	1.39	0.41	-.27	6.91***	1.58	0.52	1.43	0.42	-.32	6.51***
Body satisfaction intercept	2.42	0.57	2.83	0.48	.78	16.33***	2.56	0.62	2.60	0.59	.07	1.05
Body satisfaction slope	0.31	1.21	0.41	0.99	.09	1.26	0.34	1.19	0.35	1.21	.01	0.04

BMI intercept	19.85	2.08	20.26	2.77	.17	3.56***	19.84	2.04	20.06	2.43	.10	1.20
BMI slope	5.00	2.91	7.66	5.42	.61	5.45***	6.44	4.16	6.00	4.13	-.11	1.20
Age	28.07	1.65	28.20	1.75	.08	1.81	27.73	1.54	28.25	1.73	.32	5.96***

Note: * $p < .05$; *** $p < .001$; d = Cohen's d

Table 2:

Correlation Matrix of the Study Variables for Women (n = 1,482; below diagonal) and Men (n = 1,105; above diagonal)

	1	2	3	4	5	6	7	8	9	10
1. Sexual satisfaction T4		-.07*	.50***	.25***	-.18***	.14***	-.01	-.05	-.01	-.10*
2. Masturbation frequency T4	.16***		-.04	-.26***	.18***	-.07*	-.02	.01	-.03	-.10**
3. Intercourse frequency T4	.46***	.16***		.44***	-.07*	.04	-.06	-.01	-.02	-.06*
4. Singel versus Partner T4	.06*	-.21***	.31***		-.19***	.07	.00	.07*	-.03	.13
5. Symptoms of anxiety and depression T4	-.19***	.08***	-.04	-.11***		-.22***	.03	.00	-.06	-.04
6. Body satisfaction intercept	.06*	-.07	.02	.06*	-.07*		-.52***	-.11*	.07	.08*
7. Body satisfaction slope	.02	.03	-.03	.02	-.14**	-.48***		.03	-.28	-.01
8. BMI intercept	.01	.03	-.05	-.01	-.03	-.22***	.09		-.57**	.38***
9. BMI slope	.06	.00	.08	-.03	-.05	-.02	-.42***	-.06		-.30**
10. Age	-.07**	-.04	-.12***	.10***	-.05	.01	.17***	.38***	-.37***	

Note: * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 3

Standardized Regression Coefficients of the Relationship Between Sexual Satisfaction and Predictors in the Domain of Body Satisfaction, BMI, Relationship Status, Sexual Activity, and Mental Health

	Variables analyzed		All variables included	
	in blocks		simultaneously	
	β	p	β	p
Women				
<i>Body Satisfaction</i>				
Body satisfaction intercept	.102	.004	.093	.037
Body satisfaction slope	.080	.125	.062	.425
<i>BMI</i>				
BMI intercept	.043	.213	.051	.110
BMI slope	-.014	.676	.025	.808
<i>Relationship Status</i>				
Singel vs Partner	.065	.007	-.089	<.001
<i>Sexual Activity</i>				
Masturbation	.071	.001	.080	<.001
Intercourse	.457	<.001	.462	<.001
<i>Mental Health</i>				
Symptoms of anxiety and depression	-.198	<.001	-.175	<.001
R²			.25	

	Men			
<i>Body Satisfaction</i>				
Body satisfaction intercept	.200	<.001	.147	.004
Body satisfaction slope	.097	.160	.089	.278
<i>BMI</i>				
BMI intercept	-.022	.582	-.015	.809
BMI slope	.026	.434	-.028	.798
<i>Relationship Status</i>				
Singel vs Partner	.262	<.001	.007	.829
<i>Sexual Activity</i>				
Masturbation	-.063	.021	-.032	.288
Intercourse	.492	<.001	.479	<.001
<i>Mental Health</i>				
Symptoms of anxiety and depression	-.181	<.001	-.110	<.001
R²				.29

Note: Age included as covariate in all analyses

Figure 1. Estimated mean trajectories of body image and Body Mass Index (BMI) for men and women.