Modica, J Womens Health, Issues Care 2019, 8:2
DOI: 10.4172/2325-9795.1000329

Journal of Women's Health, Issues & Care

Research Article

A SCITECHNOL JOURNAL

The Association Between Body Surveillance and Body Satisfaction Moderated by Self-Concept Clarity in Adult Women in the United States: A Cross-Sectional Study

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Abstract

Study Background: Eating disorders are associated with significant negative health outcomes for women. Body dissatisfaction is a primary risk factor for eating disorders in women and girls. Informed by objectification theory, this study investigated whether a) body surveillance was negatively associated with body satisfaction, and b) whether self-concept clarity moderated the association between body surveillance and body satisfaction in adult women. Self-concept clarity refers to holding a stable, consistent, and clear sense of self, while body surveillance refers to habitually monitoring the appearance of one's body.

Methods: A cross-sectional, non-experimental, correlational design was employed in this study. Several well-established self-report measures were administered to adult women (n=230) online in the United States between the ages of 18 and 63 (M=34.13) who were recruited through Amazon Mechanical Turk.

Results: Results of multiple regression analysis indicated that, when controlling for age and body mass index, body surveillance was negatively associated with body satisfaction, whereas self-concept clarity was positively associated with body satisfaction. Results also evidenced that, when controlling for age and body mass index, self-concept clarity moderated the association between body surveillance and body satisfaction such that the negative association between body surveillance and body satisfaction was weaker among women who had high levels of self-concept clarity, as opposed to low self-concept clarity.

Conclusion: Being the first study to investigate self-concept clarity in the context of objectification theory, results are discussed in terms of how and why self-concept clarity might attenuate the association between body surveillance and body satisfaction. Echoing other researchers, integrating self-concept clarity into eating disorder and body image prevention programs in order to improve women's health is discussed.

Keywords

Body surveillance; Body satisfaction; Self-Concept clarity; Objectification theory; Women's mental health

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Received: May 21, 2019 **Accepted:** June 20, 2019 **Published:** June 23, 2019

Introduction

Eating disorders are associated with negative health outcomes for women in terms of physical health [1,2], reproductive health [3], and quality of life [4,5]. Concerning mental health, eating disorders in women are associated with depression [6,7], relationship impairment [8], anxiety disorders [6,7], and have the highest mortality rates of any mental disorder [9,10]. Across six European countries, the lifetime prevalence rate of any eating disorder is estimated to be 2.5% among adults [11]. A higher rate among adolescents (i.e., 5.7%) has also been found [12]. However, in the U.S. problematic eating behaviors (i.e., representing subclinical or "other specified" eating concerns) has been found to be as high as 12% [8] and 15% [13]. Conservative estimates are that eating disorders are 1.75 to 3 times as prevalent in women compared to men [6]. As such, researchers have described gender as the single greatest risk factor for eating disorders making them a significant public health issue for women [14].

Body image concerns, in particular, satisfaction with one's body (i.e., body dissatisfaction/satisfaction), is a leading risk factor for eating disorders in adolescent girls, young-adult women, and adult women [15,16], and is a central antecedent to the development of eating disorders in contemporary theories [17-19]. Research in Western countries indicates that dissatisfaction with one's body is unfortunately prevalent, with rates between 40% [20] and 89% for adolescent girls [21], and 60% for adult women [22]. Specifically, body dissatisfaction is associated with binge-eating [16,23], restricted eating [16], purging behaviors [24], as well as depression [13,25], anxiety and stress [26], and impaired sexual satisfaction [27].

It is imperative for researchers to elucidate the variables that may foster or protect against the development of body dissatisfaction in women, and researchers frequently draw upon sociocultural theories of eating disorders and body image to do so [28]. An example is the objectification theory, which proposes that women's bodies are often regarded by others as disembodied objects to be looked at [29]. Theoretically, a woman can engage in self-objectification if she internalizes this external observer's perspective and similarly views her own body as an object to be looked at [29]. Self-objectification can be manifest as body surveillance; the tendency to habitually monitor one's body and think of one's body in terms of how it looks rather than how it feels [30]. Conforming to objectification theory, correlational research shows that body surveillance is directly and positively associated with body dissatisfaction in young-adult women [31,32] and middle-aged women [33,34].

When adopting a preventative health perspective, it is important to explore which variables might moderate the association between body surveillance and body dissatisfaction. However, research on such moderators is lacking. Self-concept clarity may be one such variable. Self-concept clarity has been defined as "the extent to which the contents of an individual's self-concept (e.g., perceived personal attributes) are clearly and confidently defined, internally consistent, and temporally stable" [35]. A woman with high self-concept clarity "has greater confidence in her self-beliefs, few self-beliefs that contradict one another (e.g., timid and outgoing), and minimal fluctuation in those self-beliefs over time" [36]. Individuals high in self-concept clarity, as opposed to low, are less reactive to

self-relevant feedback [37], experience less fluctuation in their self-esteem over time [38], and are less apt to change their views of self in light of false feedback [39]. Studies with adult women evidence that self-concept clarity is directly and negatively associated with body dissatisfaction [40-42].

There is a reason to believe that self-concept clarity may moderate the association between body surveillance and body dissatisfaction. First, women with high self-concept clarity, who surveil their bodies, may be less apt to use societal standards of beauty to evaluate, judge, or compare their appearance, but instead, use an internal self-defined set of ideals which might be more realistic. Thus, conceptually, the negative self-monitoring encompassed within body surveillance may have a weaker effect on body satisfaction for such women. Second, it is also conceivable that individuals with high self-concept clarity do not experience fluctuations in beliefs and evaluations of their body as readily. This may also attenuate the association between body surveillance and body satisfaction. Given that age and Body Mass Index (BMI) are positively correlated in women [43], and that body image concerns are negatively correlated with age [44] and positively correlated with BMI [22], it seems important to consider and also control for BMI and age in such moderation analysis.

This study explored whether self-concept clarity moderates the association between body surveillance and body satisfaction. Understanding factors that moderate this association has the potential to a) inform women's health professionals about which women may be more at risk of developing body dissatisfaction, and b) inform treatment and prevention programs. In light of this study's aims, the first hypothesis was that body surveillance would be negatively associated with body satisfaction. This is informed by past research [31] and rooted in objectification theory [29]. The second hypothesis was that self-concept clarity would moderate the association between body surveillance and body satisfaction such that the association would be weaker among those individuals with high self-concept clarity, as opposed to low self-concept clarity.

Materials and Methods

Participants

The final sample in this study consisted of 230 adult women residing in the United States between the ages of 18 and 63 years old (M=34.13; SD=9.73). In this sample, many participants identified as Caucasian (74.3%), while fewer participants identified as African-American (16.1%), Asian (6.1%), American Indian or Alaska Native (1.3%), Native Hawaiian or Pacific Islander (0.4%), and those who marked "other" (1.7%). In this sample, 13.9% of participants indicated they were of Hispanic or Latino origin. The majority of participants reported being married or having a domestic partner (50.0%). Lesser proportion of participants reported being single and never married (27.8%), dating/in a relationship (15.7%), divorced (5.2%), widowed (0.9%), or separated (0.4%). In this sample, the mean Body Mass Index (BMI) was 25.88 (SD=7.72).

Procedures

Before this study was initiated, Institutional Review Board approval was acquired. Participants were recruited through Amazon Mechanical Turk (MTurk) via a brief advertisement which explained the nature of the study, participation requirements, and compensation. MTurk has been used in previous research [45], and shown to produce data that is psychometrically sound [46], more diverse and representative of the U.S. population [46] than typical self-report social-science data, and comparable to in-person data in regards to body image assessment [47]. Body image was not mentioned in the advertisement for this study. Criteria for inclusion were as follows: a) being a woman, b) being over the age of 18 years, c) not having an active eating disorder, and d) living within the United States. Interested individuals clicked a digital link in MTurk and were then taken to Qualtrics; a web-based data collection platform. All questionnaires were administered in counter-balanced order in Qualtrics. Each participant was compensated $3.00 for full participation. Data collection and participant compensation were entirely anonymous.

Measures

Body surveillance

Body surveillance was measured with the 8-item Body Surveillance Subscale of the Objectified Body Consciousness Scale [30]. This subscale assesses the tendency to habitually monitor one's appearance and the tendency to think of one's body in terms of how it looks rather than how it feels. An example item is "I think more about how my body feels than how my body looks" [35]. Items utilize a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree) with higher mean scores indicating greater body surveillance. The subscale has evidenced acceptable Cronbach's alpha [45], test re-test reliability [30], and construct validity in samples of adult women [30]. The Cronbach's alpha was 0.88 for the Body Surveillance Subscale in this study.

Body satisfaction

The 7-item Body Subscale of the Body Parts Satisfaction Scale-Revised [48] was used to assess satisfaction with one's body. On this subscale, individuals use a 6-point Likert-type scale ranging from 1 (extremely dissatisfied) to 6 (extremely satisfied) to rate their satisfaction with 7 body parts (e.g., stomach, hips), with higher mean scores indicating greater body satisfaction. In young-adult women, this subscale has shown good construct validity and internal consistency [49], as well as good test re-test reliability [50]. In this study, the Cronbach's alpha was 0.93 for the Body Subscale.

Self-concept clarity

The 12-item Self-Concept Clarity Scale [41] was used to measure self-concept clarity. On this scale, individuals indicate their level of agreement with statements using a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree), with higher sum scores indicating higher self-concept clarity. An example item is "My beliefs about myself often conflict with one another" [35]. Attesting to construct validity, research has shown that the scale correlates having a strong sense of personal identity [51]. The scale has demonstrated adequately test re-test reliability [35] and internal consistency [51] in adults. In this study, the Cronbach's alpha was 0.96 for this scale.

Demographics

Participants were asked to report their gender, age, height, weight, relationship status, ethnicity, and employment status. In this study, BMI was calculated using the participant's self-reported height and weight.

Statistical analyses

This study employed a correlational design using cross-sectional self-report data. Correlations between variables were calculated using

SPSS 25 and both hypotheses were tested through regression analysis using PROCESS Version 3 for SPSS [52] in accordance with standard procedures to test for moderation in regression [53]. In the regression analysis, body satisfaction served as the criterion variable and body surveillance, self-concept clarity, and their interaction served as predictor variables. Age and BMI were entered as covariates to control for their effects. Interaction and predictor variables were mean-centered and entered into the regression analysis simultaneously, per current guidelines [52]. Simple slopes were calculated to probe moderation effects at one standard deviation below the mean, at the mean, and one standard deviation above the mean for the moderator. In line with current recommendations [54] Johnson-Neyman zone of significance was also calculated allowing for an analysis of the exact values of the moderator that moderation existed.

Results

Preliminary analyses

Before testing hypotheses, data was carefully analyzed and screened. Initially, 253 women provided data for this study. Inspection of the data evidenced that eight individuals took less than 2 seconds to answer all items and 15 women did not provide complete or useable data for height and weight.[1] The aforementioned women were removed from further analyses. This left 230 participants. Subsequently, z-score calculations evidenced three univariate outliers and Mahalanobis distance statistics (D^2) evidenced one multivariate outlier. Removing the outliers did not impact the significance of results and thus the outliers were retained. Subsequently, data were judged to meet assumptions of linearity, independence of observations, normality, and homoscedasticity. Tolerance and variance inflation factor values suggested no concerns with multicollinearity. Cook's D, residuals, the standardized difference in fit (DFFIT) and standardized difference in beta (DFBETA) values suggested no influential cases biasing regression analysis estimates.[2]

Test of hypotheses

Bivariate correlations can be seen in Table 1. Results showed that age, BMI, and body surveillance were each significantly negatively correlated with body satisfaction. Further, self-concept clarity was not significantly correlated with body surveillance, body satisfaction, nor BMI. Last, age was positively correlated with both BMI and self-concept clarity. Results of the regression analysis showed that the overall model was significant and accounted for 42% of the variance in body satisfaction (Table 2). In this model both age and BMI were negatively associated with body satisfaction. In support of the first hypothesis, results showed that body surveillance was negatively associated with body satisfaction. Also, self-concept clarity was positively associated with body satisfaction. Concerning moderation, results evidenced that the interaction variable was significant and that adding the interaction variable significantly improved the model (ΔR^2=0.01, F(1, 224)=4.76, p<0.030). This supports the second hypothesis regarding moderation. Results of a simple slopes analysis evidenced that when self-concept clarity was below the mean (B=-0.59, 95% CI [-0.76, -0.43], t=-7.11, p<0.001), at the mean (B=-0.48, 95% CI [-0.59, -0.38], t=-8.89, p<0.001), and above the mean (B=-0.38, 95% CI [-0.50, -0.26], t=6.03, p<0.001) the slopes of body surveillance on body satisfaction were all significantly different from zero (Figure 1). The Johnson-Neyman analysis showed that the conditional effect of body surveillance on body satisfaction was significant across the entire range of self-concept clarity scores. Calculating the regression analysis without age and BMI as covariates did not change the results, except that self-concept clarity did not significantly predict body satisfaction.

Of note, a post-hoc power analysis using G*Power [55] was conducted to assess issues of sample size and power in this study. Literature suggests that interaction effects are often small [48] and range between 1-3% of the variance. Thus, for this analysis small effects (i.e., f=0.02) were chosen along with a power of 0.80, α=0.05, and 5 predictors using the linear multiple regression, fixed model, R^2 deviation from zero option. Results showed that a sample of 647 would be needed to detect a small interaction effect. Therefore, it could be judged that this study was underpowered to detect moderation.

Discussion

Conforming to past research in adult women [32,33,41] results of this study showed that body surveillance and self-concept clarity were negatively associated with body satisfaction while controlling for age and BMI. Additionally, in this study self-concept clarity moderated the association between body surveillance and body satisfaction. The negative association between body surveillance and body satisfaction was weaker among women with high self-concept clarity, as opposed to low self-concept clarity. While acknowledging the correlational nature of the analyses, one interpretation of this interaction is that high self-concept clarity might diminish the strength of the body surveillance-body satisfaction association.

While acknowledging the correlational nature of this study, there may be two conceptual reasons explaining the interaction between body surveillance and self-concept clarity.

First, Campbell [56] hypothesized that individuals low in self-concept clarity may be more "dependent on, susceptible to, and influenced by external self-relevant stimuli." Thus, perhaps women with high self-concept clarity who surveil their own bodies are less apt to draw upon external sociocultural beauty ideals with which to judged or compare their appearance compared to women with low self-concept clarity. Second, since individuals with high self-concept clarity possess more stable self-beliefs [38], it is conceivable that their beliefs or evaluations of their bodies do not fluctuate as much in response to negative psychological processes such as body monitoring or scrutiny. These propositions are speculative and future research could clarify the various reasons why self-concept clarity moderated the body surveillance-body satisfaction association.

The findings of this study have clinical and research implications. For example, in line with other recommendations [42,57], it may be fruitful to develop and investigate clinical interventions that allow women or girls to explore and bolster their sense of self or personal values as means to counter the development of body image concerns. Given that self-concept clarity is mutable via intervention [58], bolstering self-concept clarity within psychotherapy or prevention programs may improve body satisfaction or buffer the effect of risk factors such as body surveillance. These interventions could be integrated into existing body image and eating disorder prevention programs such as the Body Project [59] or integrated into empirically validated psychotherapies such as Enhanced Cognitive Behavior Therapy (E-CBT) [18]. Given that, theoretically, E-CBT assumes that a dysfunctional system for appraising one's own self-worth

[1]One of the 15 individuals provided BMI data that was biologically improbable.

[2]Leverage values suggested that one case unduly influenced the regression model. Removing this case did not alter the results in any analysis and therefore the case was retained in the data set.

lies at the heart of eating disorders, integrating therapeutic efforts to assist individuals in exploring their self-concept and self-beliefs may prove fruitful [60]. Since research has shown differences in body dissatisfaction and body surveillance between women of different races [61], future research should also explore the association between self-concept clarity and body surveillance and satisfaction in other cultural groups of women. Second, past research has demonstrated that self-concept clarity may be related to age in a curvilinear fashion; being positively correlated with age from ages 19-60, and negatively correlated with age beyond 60 years [62]. Thus, it may be useful to explore age groups in which self-concept clarity moderates the association between body surveillance and body satisfaction. It is conceivable that a moderating effect may only be observed for adolescent girls or young-adult women in the U.S. due to their developmental stages which are marked by identity formation [63].

This study includes several limitations. First, analyses utilized preclude inferences of direction between the predictor and moderator variables. It is equally possible that body surveillance moderates the relationship between self-concept clarity and body satisfaction. Second, this study was correlational and cross-sectional, which precludes conclusions regarding direction or causality. Third, this sample was non-clinical in nature and there was a high degree of homogeneity in terms of ethnicity. Thus, extending these findings to clinical populations or women of other cultural groups is not warranted. Fourth, this study measured variables via self-report, therefore incurring potential for mono-method bias. Fifth, given

Table 1: Means, standard deviations, and correlations for study variables.

S.No.		1	2	3	4	5
1	Age					
2	BMI	0.25**				
3	Body surveillance	0.01	0.12			
4	Body satisfaction	-0.24	-0.42	-0.49		
5	Self-concept clarity	0.27**	0	-0.08	-0.09	
	M	34.13	25.88	4.15	3.51	58.91
	SD	9.73	7.72	1.31	1.33	20.18
Note: Values calculated with non-mean-centered data for predictor and moderator variables; M=Mean; SD=Standard deviation; **p<0.01						

Table 2: Multiple regression analysis predicting body satisfaction moderated by self-concept clarity.

	B	SE B	t	95% CI
Age^{cov}	-0.03	0.01	-3.51***	-0.04, -0.01
BMI^{cov}	-0.05	0.01	-5.72***	-0.07, -0.04
Body Surveillance	-0.48	0.05	-8.89***	-0.59, -0.38
Self-Concept Clarity	0.01	0	2.09*	0.00, 0.01
Body Surveillance X Self-Concept Clarity	0.01	0	2.18*	0.00, 0.01
$R=0.65$; $R^2=0.42$; $F(5, 224)=32.09$; $p<0.001$				
Note: Values represent mean-centered data for predictor and moderator variables; B=unstandardized regression coefficient; 95% CI=95% confidence interval upper and lower limits for B^{cov}=Covariates; ***p<0.001; *p<0.05				

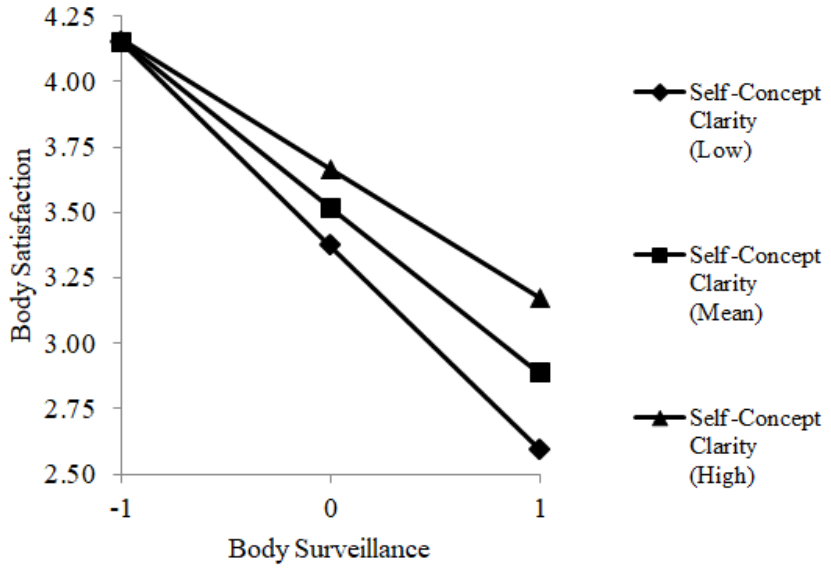

Figure 1: Association of body surveillance on body satisfaction moderated by self-concept clarity. Lines plotted at self-concept clarity at low (one standard deviation below mean), mean (at the mean), and high (one standard deviation above the mean). For body surveillance, -1 is one standard deviation below mean, 0 is at the mean, and 1 is one standard deviation above the mean.

that participants self-selected into the study and were compensated, it is possible that this allowed for certain forms of recruitment/self-selection bias which threaten the generalizability of these findings. Last, results should be interpreted in light of sample size estimates which indicate that the sample may have been underpowered. Thus, the results should be interpreted with some degree of caution.

Conclusion

Within objectification theory, body surveillance is associated with body dissatisfaction, which in turn is associated with eating pathology and concerns. Eating concerns, as well as body image, are associated with significant health problems in women. This study found evidence that self-concept clarity moderates the association between body surveillance and body satisfaction in adult women in the U.S. Notwithstanding several limitations, results in further support calls to investigate how to integrate self-concept into body image prevention programs to improve women's health functioning in young-adulthood and adulthood.

Acknowledgment

No external sources of funding were used in this study.

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