



The role of state mindfulness during yoga in predicting self-objectification and reasons for exercise



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ABSTRACT

Objectives: Objectification theory is a useful framework for understanding how individuals internalize the sexual objectification of male and female bodies. This internalization, called self-objectification, can result in negative psychological and behavioral outcomes (e.g., body shame, disordered eating). Exercise that uses mindfulness to draw attention to the body's function and sensations rather than appearance may be one way to minimize self-objectification and improve associated outcomes. Therefore, the objective of this study was to explore how state mindfulness during exercise may associate with change in self-objectification, body image variables, and reasons for exercise.

Design: This study prospectively followed participants ($N = 148$, 80% female) from six yoga classes that met 2–3 times a week across an 8-week period.

Method: Repeated measures MANOVAs were used to examine change over time in state mindfulness, self-objectification, physical self-concept, and reasons for exercise. Regression analysis was used to examine how state mindfulness predicted change in outcome variables.

Results: MANOVAs revealed significant decreases in self-objectification and increases in physical self-concept, health/fitness-related reasons for exercise, and state mindfulness. Further, results indicated that mindfulness during exercise was linked with decreases in self-objectification and increases in more internal reasons for exercise over time.

Conclusions: State mindfulness plays a role in predicting change in self-objectification and reasons for exercise during yoga practice.

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In the last two decades, objectification theory (Fredrickson & Roberts, 1997) has become a widely used framework for identifying root causes, classifying the distinct qualities, and predicting the negative repercussions of widespread body dissatisfaction and body shame that plague women living in Western cultures today. Fredrickson and Roberts (1997) propose that self-objectification occurs when women internalize the sexual objectification of their bodies, leading them to view themselves as an object represented solely by how their bodies appear to others. Self-objectifying women engage in habitual, self-conscious body surveillance (i.e., mentally scanning the body from an observer perspective). As a result, these women experience negative psychological consequences such as body shame, separation from internal bodily experiences, and

chronic division of attentional focus resulting in an inability to obtain a state of 'flow' (i.e., complete focus and immersion in the task at hand; Fredrickson & Roberts, 1997). Self-objectification has traditionally been conceptualized as specific to females, but as sexual objectification of males in the media becomes increasingly prevalent, contemporary research shows that self-objectification is a real and measurable problem in men as well (Calogero, 2009; Daniel, Bridges, & Martens, 2014; Strelan & Hargreaves, 2005).

Research supports these theoretical contentions in both men and women with significant associations between higher self-objectification and greater disordered eating (Calogero, 2009; Daubenmier, 2005; Greenleaf, 2005), higher body shame (Daniel et al., 2014; Greenleaf, 2005), lower body satisfaction (Prichard & Tiggemann, 2005; Strelan, Mehaffey, & Tiggemann, 2003), lower body- and self-esteem (Impett, Henson, Breines, Schooler, & Tolman, 2011; Strelan et al., 2003), higher appearance-related reasons for exercise, and lower health/fitness and mood/enjoyment reasons for exercise (Prichard & Tiggemann, 2005; Strelan et al., 2003; Strelan & Hargreaves, 2005). In addition to the

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negative psychological outcomes associated with self-objectification, there is also evidence for a negative relationship between self-objectification and exercise behavior in a sample of older women (Greenleaf, 2005). The negative consequences of self-objectification indicate a need to identify ways to address the internalization of sexual objectification among men and women.

Exercise has been proposed as a strategy to decrease self-objectification (Greenleaf, 2005) and improve associated body image constructs such as body shame, social physique anxiety, and physical self-concept (Lox, Martin Ginis, & Petruzzello, 2010). Numerous studies have supported the beneficial effects of exercise on self-objectification and related body-image variables (e.g., Impett, Daubenmier, & Hirschman, 2006; Martin Ginis, McEwan, Josse, & Phillips, 2012; Williams & Cash, 2001). For example, participation in yoga is associated with decreased self-objectification (Daubenmier, 2005), while aerobic exercise is related to reductions in social physique anxiety (Martin Ginis, Strong, Arent, Bray, & Bassett-Gunter, 2014). However, the effects appear to vary with different characteristics of the exercise experience. Self-objectification or body image outcomes vary between exercise modes (e.g., Martin Ginis et al., 2014; Prichard & Tiggemann, 2008), exercise environments (e.g., Prichard & Tiggemann, 2005, 2008), and instructor emphasis (O'Hara, Cox, & Amorose, 2014; Raedeke, Focht, & Scales, 2007). The underlying mechanisms that explain these differences remain unknown and largely unexplored.

Objectification theory (Fredrickson & Roberts, 1997) provides some clues about the mechanisms responsible for differences in body image outcomes across exercise studies. Fredrickson and Roberts (1997) suggest that individuals' self-objectification varies based on personal exposure to contexts which either mitigate or intensify the internalization of sexual objectification. Repeated exposure to situations that contain objectifying cues can lead to increased self-objectification and concerns about one's appearance (Prichard & Tiggemann, 2005). Traditional exercise settings may encourage thoughts about how one appears to others through objectifying cues including mirrors, certain exercise clothing, or images displaying perfectly lean and muscular bodies (Prichard & Tiggemann, 2005). Conversely, if an exerciser's attention is focused on their internal physical experience, this should reduce the allocation of mental resources to one's appearance. Directing one's attention to the physical experience of exercise may, at least temporarily, protect the individual from self-objectification (Impett et al., 2006; Prichard & Tiggemann, 2012).

Certain forms of exercise, such as yoga, may be particularly effective at fostering participants' focus on the experience of the movement itself (Impett et al., 2006). In yoga, the emphasis on being present in one's body makes it an ideal exercise mode for exploring how attention to physical experience relates to self-objectification. Though yoga originated in India over 4000 years ago and exists in a variety of forms today, most of the Western world currently practices some variation of Hatha yoga. Hatha yoga usually includes a combination of strengthening physical postures and movement, breathing exercises, and meditation in order to promote greater awareness of the mind and body (Riley, 2004). Yoga instructors continually use physical cues to direct participants' attention to how their bodies feel and move (Boudette, 2006). When observing their bodies, practitioners are encouraged to take a nonjudgmental view of their own personal progress. Based on their progress and how their bodies feel, practitioners are given numerous opportunities to modify poses and sequences to match their bodies' needs regarding intensity and challenge. Instructors actively discourage comparison to others. This attentiveness to the body that is fostered during yoga has been shown to increase individuals' awareness of internal bodily experiences (Impett et al., 2006).

Evidence from both cross-sectional and intervention studies

consistently supports the link between yoga and lower self-objectification and more adaptive outcomes, including positive body image and more internalized motivation, in women and men (Carei, Fyfe-Johnson, Breuner, & Brown, 2010; Daubenmier, 2005; Dittman & Freedman, 2009; Impett et al., 2006; Prichard & Tiggemann, 2008). Specifically, in cross-sectional studies, yoga participation is associated with lower self-objectification and appearance-related reasons for exercise (Daubenmier, 2005; Delaney & Anthis, 2010; Prichard & Tiggemann, 2008), higher body satisfaction and health/fitness reasons for exercise (Daubenmier, 2005; Dittman & Freedman, 2009; Prichard & Tiggemann, 2008), and improved body image (Flaherty, 2014). Intervention studies ranging from eight weeks to four months have demonstrated that yoga practice can be used to decrease self-objectification (Impett et al., 2006), disordered eating symptomatology (Carei et al., 2010), and increase body awareness, positive affect, physical self-worth and positive body image (Elavsky, 2009; Impett et al., 2006; Ranjbar, Moghddam, & Pasand, 2014). Despite these promising findings, most studies have been characterized by small sample sizes, inclusion of few or no men (despite emerging research showing men are also negatively impacted by self-objectification; see Daniel et al., 2014), little or no description of the kind of yoga that was practiced, and cross-sectional designs or brief study duration. Thus, the existing research is primarily descriptive in nature with little attention given to identifying the mechanisms that may explain these positive outcomes associated with yoga.

The nonjudgmental nature of yoga and its strong focus on attending to and being present in one's body may be one of the underlying mechanisms that explains why yoga is associated with lower self-objectification and more adaptive body image and motivation outcomes. Nonjudgmental attention to and awareness of one's present experience including mental, physical, or environmental stimuli, is referred to as mindfulness (Bishop et al., 2004; Brown & Ryan, 2003). Though there is some evidence that trait mindfulness (i.e., general tendency to be mindful in daily living) plays a role in the relationship between yoga participation and higher subjective quality of life (Gard et al., 2012), researchers have not investigated the specific role that being mindful of one's experience during yoga (i.e., state mindfulness) may have on psychological outcomes. Brown and Ryan (2003) have demonstrated that state mindfulness has independent effects, over and above trait mindfulness, on positive and negative affect and autonomous motivation in a daily living context, further supporting the importance of exploring state mindfulness. Given these findings, it may be particularly important to investigate the role of mindful attention and awareness to one's current physical experience during yoga when examining outcomes related to self-objectification.

The purpose of this study was to use a prospective design to test the degree to which participants' state mindfulness during the practice of yoga explains changes in self-objectification and related outcomes across an 8-week period. First, we tested for change in state mindfulness, self-objectification, and relevant correlates of self-objectification (i.e., body shame, physical self-concept, and reasons for exercise) in yoga participants over an 8-week period. Second, we tested whether participants' degree of mindfulness during the practice of yoga predicted change in these variables. It was hypothesized that there would be overall declines in self-objectification, body shame, and appearance-related reasons for exercise and overall increases in physical self-concept, health/fitness reasons and mood/enjoyment reasons for exercise. Further, it was predicted that greater state mindfulness during yoga at the end of the eight weeks would predict increases in physical self-concept, health/fitness reasons, and mood/enjoyment reasons for exercise and predict decreases in self-objectification, body shame, and appearance-related reasons for exercise across the eight weeks.

1. Method

1.1. Participants and procedure

This study used a prospective study design to follow individuals registered for yoga classes that convened two or three times per week over a period of eight weeks. These yoga classes were offered by a mid-size university in the Northwest region of the United States and the study was granted exempt status from the Institutional Review Board. This indicates that regulatory requirements for informed consent do not apply; however participants must still be given the choice to participate and be fully informed. The classes were for-credit academic physical activity courses, ranging from beginning to intermediate yoga (i.e., beginning, intermediate, yoga flow, vinyasa yoga, and yoga toning) and taught by two similarly trained instructors. Despite differences in the names of the classes (e.g., yoga toning, vinyasa yoga), the students in all classes were taught Hatha yoga, in which they practiced different series of poses (i.e., asanas) that were held in order to build strength and flexibility. The intermediate-level classes also emphasized building a strong vinyasa base (i.e., movement through the poses) to enhance physical strength and endurance. Instructors cued physical alignment and focused attention to one's breath in all classes as an integral part of creating and establishing present awareness.

Classes met for either 50 min three times per week or 75 min two times per week for eight weeks, so students were exposed to the same amount of yoga practice regardless of their class schedule. Surveys assessing yoga experience and level, and all trait-level outcome variables (i.e., self-objectification, body shame, physical self-concept, and reasons for exercise) were administered by a team of faculty, graduate and undergraduate students on their first day of class and again on their final day of class. Surveys assessing state variables of mindfulness of the mind and body were administered immediately following participants' yoga practice on the second day of class and again immediately following a yoga practice on the second-to-last day of classes. Participants who anticipated missing class on the final day were asked to take the second trait assessment following their second state assessment.

Though 202 participants completed the initial baseline survey, only participants who completed all surveys were included in the analyses ($N = 148$). Pearson's chi-square and MANOVAs were conducted to test for significant differences in demographics (e.g., age, gender, race) or study variables between those who completed all surveys and those who did not. No significant differences emerged. The majority of the sample was female (80%), white (91%), and between the ages of 18 and 23 (88%). Three percent of participants were graduate students, while the rest were either in their first (4%), second (18%), third (21%), fourth (40%), or fifth or more (14%) year of college. Participants reported their yoga experience level as either beginning (58%), beginning–intermediate (26%), intermediate (14%), or intermediate–advanced (2%). No participants classified themselves as advanced. At the end of the 8-weeks, students were asked to self-report their attendance. The majority (67%) reported missing one or two classes, with 9% missing none and about 26% missing three to six classes. No one reported missing more than six classes. Though it was not measured, all students were encouraged by instructors to attend other classes to make up absences.

1.2. Measures

1.2.1. Self-objectification and body shame

Two subscales from the Objectified Body Consciousness Scale (McKinley & Hyde, 1996) were used to assess body surveillance (8 items; e.g., "During the day, I think about how I look many times") and body shame (8 items; e.g., "I would be ashamed for people to

know what I really weigh"). Participants responded to items on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Items were averaged within each subscale and higher scores represent higher self-objectification and shame. Participants could also choose "NA" if the item did not apply to them. Research with both men and women has provided validity and internal consistency reliability evidence for both subscales (McKinley, 1998).

1.2.2. Physical self-concept

Six items from Marsh, Richards, Johnson, Roche, and Tremayne's (1994) Physical Self-Description Questionnaire (PSDQ) measured participants' general feelings about their physical self (e.g., "I am satisfied with the kind of person I am physically"; "I feel good about the way I look and what I can do physically"). Participants were asked to describe their physical selves on a scale ranging from 1 (*false*) to 6 (*true*). Items were averaged and higher scores represent more positive physical self-concept. Research using this subscale of the PSDQ has demonstrated both construct validity and internal consistency reliability (Marsh et al., 1994).

1.2.3. Reasons for exercise

Silberstein, Striegel-Moore, Timko, and Rodin's (1988) Reasons for Exercise Inventory was used to measure participants' reasons for being physically active in general. The 24 items asked respondents to rate why they exercise on a scale ranging from 1 (*not at all important*) to 7 (*extremely important*). The items represent three subscales: appearance (e.g., "to be slim"), health/fitness ("to improve my strength"; "to maintain my physical well-being"), and mood/enjoyment ("to cope with sadness, depression"; "to have fun") reasons for exercise (Strelan et al., 2003). Items within each subscale were averaged and higher scores represent higher importance of each respective category of reasons for exercise. Previous research supports construct validity and internal consistency of the three subscales used in this categorization approach (Strelan et al., 2003).

1.2.4. State mindfulness

The State Mindfulness Scale for Physical Activity (SMS-PA; Cox, Ullrich-French, & French, 2015, *in press*) was used to assess both mental and physical objects of participants' mindfulness during their yoga class. The SMS-PA was developed based on a revision of the State Mindfulness Scale (Tanay & Bernstein, 2013), and is designed to specifically assess aspects of mindfulness most relevant in a physical activity context. Thus, it measures nonjudgmental state attention to and awareness of mental and physical events during the yoga lesson just completed. This measure includes six items reflecting mindfulness of the mind (e.g., "I noticed emotions come and go"; "I noticed pleasant and unpleasant thoughts") and six items reflecting mindfulness of the body (e.g., "I focused on the movement of my body"; "I listened to what my body was telling me"). Participants were instructed to think about the activity they just completed when responding to how much they experienced each of the items using a response scale ranging from 0 (*not at all*) to 4 (*very much*). Items within each subscale are averaged and higher scores represent higher mindfulness. This modified measure has received preliminary psychometric support. Internal consistency reliability of each subscale has ranged from .87 to .93 (Cox et al., 2015, *in press*). Confirmatory factor analysis supported a bi-factor structure indicating that each subscale (i.e., mind and body) could be used separately or the entire scale could be used as an indicator of overall state mindfulness. Construct validity was supported by moderate positive correlations between each subscale and another state mindfulness measure (Toronto Mindfulness Inventory; Lau et al., 2006) and negative correlations between the state body mindfulness subscale and state body surveillance (Cox et al., 2015, *in press*).

1.3. Data analysis

Data were first screened for patterns of missingness, normality, and outliers. Descriptive statistics were calculated including means, standard deviations, bivariate correlations and internal consistency reliabilities for each scale at both time points (see Tables 1 and 2). In order to address the first study purpose, a repeated-measures MANOVA was conducted to test for change over time in self-objectification, physical self-concept, body shame and reasons for exercise (i.e., appearance, health/fitness, mood/enjoyment). A second MANOVA was conducted to test for change over time in state mindfulness during yoga class. Next, to address the second study purpose, a series of regression analyses was conducted to predict change in these outcome variables with state mindfulness of the mind and body. Standardized residual scores for each outcome variable were calculated based on the beginning and end scores and served as the dependent variables representing change in separate regression analyses. State mindfulness of the mind and state mindfulness of the body during the eighth week of classes served as predictors of change in each outcome variable. This approach allowed us to examine a representation of change in these constructs while adjusting for baseline variance (see Schutz, 1989).

2. Results

2.1. Data screening and descriptive statistics

A missing data analysis using Little's MCAR test indicated that the data were missing completely at random (MCAR) ($\chi^2 = 13,162.05$, $df = 18,359$, $p = 1.0$). Therefore, expectation–maximization (EM) was used to replace missing values prior to calculating variables for the main analyses. Cronbach's alpha levels indicated acceptable internal consistency reliability levels, ranging from .78 to .97 for all study variables (see Table 1). After variables were calculated, univariate skewness (–.94 to .70) and kurtosis (–.60 to .79) values indicated normal distributions.

Means, standard deviations, and bivariate correlations among all variables at the beginning and end of the 8-week time period appear in Tables 1 and 2. On average, scores generally fell above the midpoint of each respective scale, except for shame which fell just below the midpoint. Correlations were in anticipated directions with significant positive relationships among self-objectification, body shame, and appearance reasons for exercise. A significant negative relationship was found between self-objectification and physical self-concept. Physical self-concept was also negatively correlated with body shame, as well as appearance reasons for exercise. State mindfulness variables were positively related to mood/enjoyment and health/fitness reasons for exercise.

2.2. Change over time

A repeated measures MANOVA was conducted to explore

Table 1
Internal consistency and correlations between study variables (N = 148).

Variable	1	2	3	4	5	6	7	8
1 Self-objectification	.82/.87	.53**	–.36**	.39**	–.01	.62**	.00	–.02
2 Body shame	.50**	.82/.84	–.47**	.30**	–.10	.41**	–.05	–.09
3 Physical self-concept	–.29**	–.48**	.97/.97	–.05	.24**	–.27**	.17*	.17*
4 Mood/enjoyment reasons	.16*	.15	–.01	.78/.81	.43**	.53**	.30**	.18*
5 Health/fitness reasons	.01	.06	–.02	.51**	.87/.87	.28**	.26**	.29**
6 Appearance reasons	.55**	.33**	–.29**	.42**	.33**	.87/.90	.05	.05
7 Mind-mindfulness	.08	.07	.10	.28**	.27**	.12	.89/.92	.51**
8 Body-mindfulness	.15	.01	.10	.23**	.34**	.18*	.45**	.87/.92

Notes. Cronbach's alpha values for both time points on diagonal in bold, time one before slash, time two after slash. Time one correlation values below diagonal, time two correlation values above diagonal, * $p < .05$, ** $p < .01$ (2-tailed).

Table 2
Univariate results for change in outcome variables over time.

Measure	Range	Time 1 M(SD)	Time 2 M(SD)	F	η_p^2
Self-objectification	1–7	4.33(1.04)	3.93(1.07)	41.98**	.22
Body shame	1–7	3.10(1.16)	3.00(1.18)	1.51	.01
Physical self-concept	1–6	3.90(1.19)	4.38(1.07)	51.76**	.26
Mood/enjoyment reasons	1–7	4.34(1.10)	4.49(1.11)	3.30	.02
Health/fitness reasons	1–7	5.53(.96)	5.72(.87)	6.56*	.04
Appearance reasons	1–7	4.24(1.29)	4.30(1.33)	.97	.01
Mind-mindfulness	0–4	2.24(.91)	2.45(.92)	10.68**	.07
Body-mindfulness	0–4	3.11(.63)	3.25(.67)	6.41*	.04

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

change over time in self-objectification, physical self-concept, body shame, and reasons for exercise (see Table 2). The omnibus results showed a significant main effect for time, Wilks' Lambda = .61, $F(6, 142) = 15.02$, $p = .00$, $\eta_p^2 = .39$ (i.e., a large effect size). Univariate tests indicated that self-objectification, physical self-concept, and health/fitness reasons for exercise changed significantly over the eight weeks in the expected directions ($p < .05$). A repeated measures MANOVA was also conducted to examine change over time in state mindfulness (see Table 2). Omnibus results showed a significant main effect for time, Wilks' Lambda = .92, $F(2, 146) = 5.99$, $p = .00$, $\eta_p^2 = .08$ (i.e., a small effect size), with univariate statistics indicating a significant increase in both state mindfulness of the mind and of the body.

2.3. Regression analyses

In each regression analysis, gender, yoga level (beginner/non-beginner), yoga class (e.g., yoga flow, yoga toning, etc.), level of yoga class (beginning/intermediate), yoga days per week (2 days/3 days), instructor, and number of days missed were all initially included as potential covariates that might explain some of the variability in change over time. However, all were nonsignificant and were removed from these analyses. In the first regression analysis predicting change in self-objectification, mindfulness variables from week eight explained 4% (i.e., a small effect size) of the variance in change in self-objectification, $F(2, 145) = 3.19$, $p = .04$. In this model, greater mindfulness of the body significantly predicted decreases in self-objectification ($\beta = -.22$, $p = .02$). In the regression analysis predicting change in health/fitness-related reasons for exercise, mindfulness variables from week eight explained 7% (i.e., a small effect size) of the variance in change in health/fitness reasons for exercise, $F(2, 145) = 5.21$, $p = .01$. Higher mindfulness of the body significantly predicted increases in health/fitness reasons for exercise ($\beta = .21$, $p = .02$). Finally, mindfulness variables from week eight explained 4% of the variance in change in mood/enjoyment-related reasons for exercise, $F(2, 145) = 3.22$, $p = .04$. In this model, higher mindfulness of the mind was the only significant predictor of increases in mood/enjoyment-related reasons for

exercise ($\beta = .20, p = .04$). Mindfulness variables did not significantly predict changes in body shame, physical self-concept or appearance-related reasons for exercise. Table 3 displays the results from all regression analyses.

3. Discussion

Exercise has been proposed as a potential strategy for decreasing self-objectification (Greenleaf, 2005; Impett et al., 2006) and the associated negative consequences (e.g., body shame and dissatisfaction, disordered eating). Intervention studies support the positive effect of exercise on body image outcomes (Reel et al., 2007). However, consistent with objectification theory (Fredrickson & Roberts, 1997), some evidence suggests that characteristics of the exercise experience can result in higher self-objectification. For example, correlational studies have shown that more time spent exercising in potentially objectifying environments such as a gym or fitness setting and engaging in higher levels of aerobic exercise has been associated with higher self-objectification (Prichard & Tiggemann, 2005, 2008). Therefore, improvements in body-image related variables may depend on the degree to which the situation encourages the allocation of mental resources to concerns related to the appearance evaluations of others (Prichard & Tiggemann, 2005) versus the immediate experience of moving one's body (Impett et al., 2006).

This study extended past research on the effects of exercise on self-objectification by testing for change in self-objectification and related variables prospectively across the course of 8-weeks of yoga participation with a relatively large sample that included males and females. Another key extension was testing the potential of state mindfulness to act as a mechanism to predict these changes. Results revealed significant decreases in self-objectification and increases in physical self-concept and health/fitness reasons for exercise, as well as significant increases in state mindfulness. Furthermore, state mindfulness of the body during yoga class at the end of the eight weeks explained decreases in self-objectification and increases in health/fitness reasons, while state mindfulness of the mind explained increases in mood/enjoyment reasons for exercise. Therefore, findings support the notion that being more mindful, especially regarding physical sensations, such as breathing and physical alignment during exercise, may be an effective strategy to reduce self-objectification and support more internal reasons for exercise.

Fundamental elements of the Hatha yoga style used in this study include continuous cues to physical positioning and sensations of the body. This strong emphasis on the movement and feeling of their bodies may help participants shift their view of their bodies from more esthetic or external aspects to more functional or internal aspects. This is evidenced by the significant decrease in how much participants surveyed their bodies or were concerned about the appearance of their bodies (i.e., self-objectification) across the eight-weeks of yoga participation. This finding is consistent with

objectification theory, which states that environments with less objectifying cues or emphasis on the appearance of one's body should reduce self-objectification (Prichard & Tiggemann, 2005). Our findings are also consistent with correlational studies demonstrating a negative relationship between yoga participation and self-objectification (Daubenmier, 2005; Prichard & Tiggemann, 2008) as well as Impett et al.'s (2006) intervention study in which self-objectification significantly decreased during a 2-month yoga immersion program. In addition, state mindfulness explained a significant, albeit small, amount of variance in the change in self-objectification, which suggests that exercise contexts that intentionally promote mindfulness may be most beneficial. This counters other theoretical perspectives that posit that increasing self-awareness elicits self-evaluative processes against a standard which can result in negative self-evaluations when the standard is unrealistic or unattainable (e.g., Duval & Wicklund, 1972; Silvia & Duval, 2001). However, these perspectives do not consider the mindfulness characteristics of openness and acceptance in combination with self-awareness. The most adaptive experience may be self-awareness combined with a non-judgmental and non-evaluative mindset that focuses on the physical experience over appearance.

Based on objectification theory (Fredrickson & Roberts, 1997), we expected that improvements in physical self-perceptions and emotions would be observed in situations where self-objectification is less likely to be encouraged. Although we observed a significant increase in physical self-concept, there was no significant change in body shame. Shame may be more resistant to change than other body-related variables because it is integrated with self-esteem and global attributes (Tracy & Robins, 2004). A longer observation period may be necessary to observe changes in shame. Another possible explanation is the nonjudgmental component of mindfulness which suggests that the presence of negative thoughts or emotions is not harmful. Acceptance and Commitment Therapy perspectives support this contention by suggesting the degree to which we respond to, fuse to, and react to thoughts and feelings leads to adaptive or maladaptive consequences (Hayes, Strosahl, & Wilson, 2011). Therefore, the increases observed in mindfulness suggest that participants may be more aware of their thoughts and emotions, but in a nonjudgmental, accepting manner, which could represent the ability to hold negative thoughts and emotions, like shame, without subsequent negative consequences. Finally, a floor effect may have limited potential change in body shame due to the low to moderate scores on this construct. These speculations require further examination.

Our hypotheses regarding reasons for exercise were only partially supported by a significant increase in health/fitness reasons for exercise over time. This increase is consistent with the focus of the yoga classes on the function and movement of the body and with cross-sectional research showing a positive correlation between yoga participation and health/fitness reasons for exercise (Prichard & Tiggemann, 2008). As participants learned to focus

Table 3
Multiple regression results predicting standardized residual change in outcomes with mindfulness.

Outcome variable	F (2, 145)	R ²	Standardized regression coefficients	
			Mindfulness – mind	Mindfulness – body
Self-objectification change	3.19*	.04	.04	-.22*
Shame change	.77	.01	.04	-.12
Physical self-concept change	1.27	.02	.02	.12
Mood/enjoyment reasons change	3.22*	.04	.20*	.01
Health/fitness reasons change	5.21**	.07	.08	.21*
Appearance reasons change	.92	.01	.09	-.13

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

inward on the way their body felt during yoga and the gains they may have experienced in strength and flexibility, they may have placed more value on the health-related benefits of participating in yoga. It may be that the importance of physical appearance is so deeply entrenched in Western culture (Bordo, 2003) that appearance-related exercise motives are more difficult to change across a relatively short time-period.

The more mindful participants were of the physical movement of their body and the way their body felt during yoga, the more self-objectification decreased and the more health/fitness and mood/enjoyment reasons for exercise increased across the 8-weeks of yoga participation. This extends research on objectification theory, by offering some initial support that mindfulness during yoga acts as a mechanism to reduce self-objectification. More broadly, it supports contentions that exercise can lead to improvements in body image when attention is drawn to one's physical experience (Lox et al., 2010; Martin Ginis et al., 2012; Martin Ginis et al., 2014). The results also illustrate the potential for mindful exercise experiences to cause adaptive changes in reasons for exercise. This supports Brown and Ryan's (2003) research demonstrating a positive association between state mindfulness for daily activities and more internalized motivation regulations. It is conceptually consistent that mindfulness of the body predicted the more physically relevant health/fitness reasons whereas mindfulness of the mind predicted the more mentally relevant mood/enjoyment reasons. These findings support the distinction and relative independence between these two different foci of state mindfulness, and suggest that future research regarding each object of mindfulness is needed to further understand their respective roles in different outcomes. Though mindfulness did not explain decreases in appearance reasons, its association with increases in the more internal reasons for exercise (i.e., health/fitness, mood/enjoyment) is promising for participants' long-term exercise engagement. Research has consistently supported positive relationships between more internal sources of motivation and physical activity behavior (see Teixeira, Carraça, Markland, Silva, & Ryan, 2012), regardless of levels of external sources of motivation (Ullrich-French & Cox, 2009). Mindfulness appears to be a beneficial state during exercise, therefore future research studies should examine mindfulness during different types of exercise and design intentional interventions to optimize mindfulness during exercise.

Though this study extended existing research in several key ways, there are limitations that need to be addressed in future research. First, this study employed a prospective study design; thus, the lack of an experimental design using random assignment or a comparison group precludes drawing conclusions concerning effects of yoga on the outcome variables that were examined. Second, the sample was limited in several ways including significantly more females than males, a self-selecting sample who chose to participate in yoga, and primarily college-aged participants. Future studies that include more male participants are needed to provide adequate power to test for gender differences in the role of yoga and mindfulness in supporting positive body image. Similarly, examination of younger samples will allow us to test for potential developmental differences concerning the effect of mindfulness during exercise on body image and reasons for exercise. Third, the study was limited to the examination of yoga as a mode of exercise that may promote positive body image. In future work, we need to continue to explore the role of mindfulness in other modes of exercise to confirm its adaptive effects. Finally, including more assessments of state mindfulness over an eight or twelve-week period of time would allow us to account for intra-individual variability via multi-level modeling and potentially explain more variance in change in the outcome variables.

Our findings represent important extensions given the

limitations of past research on yoga and self-objectification, including cross-sectional designs or short duration, limited sample sizes, and low variability in yoga proficiency. Our study extends existing work by using a prospective design over eight weeks with a larger sample and a relatively balanced distribution of participants across levels of yoga experience. Examining the role of mindfulness during yoga suggests that the characteristics of participants' experiences are relevant to understanding the mechanisms through which exercise may support a less objectified view of the self and more internal reasons for exercise. This study provides promising evidence to support further intervention research designed to enhance mindfulness and associated positive outcomes.

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