

# A Person-by-Situation Account of Why Some People More Frequently Engage in Upward Appearance Comparison Behaviors in Everyday Life

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Although the influence of stable, trait-like factors (such as trait body dissatisfaction and appearance internalization) on instances of appearance comparison has been well documented, the additive and interactive influence of contextual factors (such as one's current body satisfaction) on comparison behaviors is unknown. Therefore, the present study tested a Person  $\times$  Situation model in which both state and trait body image variables interacted to predict engagement in various forms of comparison (upward, downward, and lateral). Participants included 161 women who completed a baseline measure of trait body dissatisfaction and internalization, and then completed, via an iPhone app, an ecological momentary assessment phase in which they reported momentary experiences of mood and comparison behaviors at up to 6 random times per day for 7 days. Multilevel analyses revealed that upward comparisons (comparisons against more attractive people) were more likely for individuals with heightened trait and/or state

negative body image, but these predictive effects of state and trait on appearance comparisons appear largely independent of each other. Furthermore, neither state nor trait body image variables were related to the other forms of comparison, and time lag at the state-level between predictor and outcome did not seem to influence the strength of these associations. Present findings are consistent with the notion that how an individual feels in the moment about their appearance may influence engagement in deleterious appearance behaviors. However, further testing is needed to confirm these causal hypotheses.

*Keywords:* appearance comparisons; body image disturbance; ecological momentary assessment; thin ideal; internalization

SOCIAL COMPARISON THEORY (Festinger, 1954) proposed that engaging in comparison with others occurs regularly. These comparisons may be upward (i.e., against someone closer to one's ideal), lateral (comparing against someone who is similar), or downward (comparing against an individual further from the particular ideal). Within the context of body image, upward appearance comparisons seem to be more common than downward comparisons (e.g., Leahey, Crowther,

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& Mickelson, 2007; O'Brien et al., 2009; Ridolfi, Myers, Crowther, & Ciesla, 2011). For instance, Ridolfi et al. (2011) tracked a sample of female undergraduate students for a period of 5 days using ecological momentary assessment (EMA) and found that upward comparisons were twice as common as downward comparisons when the comparison target was a peer, and approximately three times as common when media comparisons were undertaken. Leakey et al. (2007) showed that for women with heightened trait body dissatisfaction, upward comparisons made during a 1-week testing period were four times more common than downward comparisons, whereas the number of upward and downward comparisons were roughly equal for women with low trait body dissatisfaction levels. The relative frequency of lateral comparisons remains unclear as they are seldom reported in these ecological assessment studies.

The prevalence and intra-individual persistence of upward appearance-related comparisons are surprising for several reasons. First, as the idealized thin physique (the "thin ideal") for women in Western cultures is recognized as being difficult—if not impossible—for most women to attain, it presents a thoroughly unrealistic comparison to strive for (Spitzer, Henderson, & Zivian, 1999). Whereas in other domains, such as academic achievement, upward comparisons tend to be made against similar targets and thus drive motivation to improve (Dijkstra, Kuyper, van der Werf, Buunk, & van der Zee, 2008), upward appearance comparisons tend to be against dissimilar targets, such as the thin ideal (Groesz, Levine, & Murnen, 2002; Myers & Crowther, 2009), and hence may be expected to promote negative feelings about one's self as the individual falls short of their appearance-related goal (Appel, Crusius, & Gerlach, 2015; Myers, Ridolfi, Crowther, & Ciesla, 2012).

Second, individuals continue to engage in these comparisons despite the negative consequences that often follow an instance of appearance comparison. Engagement in upward appearance comparisons have been associated with a range of unhealthy consequences, including lowered self-esteem (Appel et al., 2015), negative mood (Ridolfi et al., Myers, Crowther, & Ciesla, 2011), increased guilt (Leakey, Crowther, & Ciesla, 2011), decreased body satisfaction (Myers et al., 2012), and eating disorder pathology (Arigo, Schumacher, & Martin, 2014). While not limited to this group, individuals with body image disturbances (e.g., those with heightened trait body dissatisfaction, extreme level endorsement of the importance of physical appearance, or eating pathology) seem more likely to engage in these upward comparisons (Leakey et al.,

2007, Leakey et al., 2011) and show stronger negative effects post-comparison in terms of thoughts of dieting and exercise, negative mood, and body dissatisfaction (Fitzsimmons-Craft et al., 2012; Leakey et al., 2011; Myers et al., 2012). Accordingly, these comparison behaviors may thus serve to perpetuate and exacerbate their preexisting body image concerns.

Despite the justifiable focus on upward comparisons in the majority of these prior studies, those studies that included measures of downward comparisons show that both forms of comparison may occur regularly within the same individuals (e.g., Leakey et al., 2007; Ridolfi et al., 2011). Unfortunately, whereas a trait-based approach (e.g., trait body dissatisfaction or internalization as a predictor) can predict who is more likely to engage in upward comparisons in general, it is insufficiently nuanced to predict *when* such individuals are more or less likely to engage in instances of comparisons whether upward, downward, or lateral. Person by Situation Theory (Mischel & Shoda, 1995) may provide greater insight into this issue, as it proposes that the occurrence of a specific behavior jointly depends upon individual traits and contextual influences (e.g., current mood state, whether one is accompanied by friends, etc.). Thus, an individual may have a general tendency towards a particular behavior, but the likelihood of this occurring at a given point in time, and leading to a particular outcome, depends on prevailing contextual factors. For instance, an individual with trait body dissatisfaction and/or who internalizes the thin ideal may, in general, be more likely to engage in upward comparisons (relative to non-comparison), yet the risk of this occurring may be greater in instances where she feels negatively and lesser when she feels positively about her appearance.

To date, experimental and ecological momentary assessment studies have focused on characteristics of the comparator (e.g., stranger vs known other, similar vs dissimilar comparator, etc.) as contextual determinants of the consequences of appearance comparisons (Knobloch-Westerwick & Romero, 2011; Krones, Stice, Batres, & Orjada, 2005; Leakey & Crowther, 2008; McKee et al., 2013). Largely neglected from these comparisons are contextual factors such as one's immediate affect level, rather than characteristics of the comparator.

We argue that there are several bases to suspect that one's state body satisfaction (i.e., how they feel about their appearance at a given moment) may directly influence the likelihood of engaging in an appearance comparison, the type of comparison they make (i.e., upward, downward, or lateral), and may also reduce/increase the likelihood of such behavior

among individuals with trait-level body image disturbances. EMA studies, which explore target behaviors *in situ* and over extended time periods (e.g., a week or fortnight rather than a single laboratory session), show that state body dissatisfaction is predictive of engagement in a variety of negative body image-related behaviors, including disordered eating and dieting efforts (Holmes, Fuller-Tyszkiewicz, Skouteris, & Broadbent, 2014; Rydin-Gray, 2007). In contrast, when individuals are more satisfied with their appearance, they are more likely to engage in and enjoy social interactions (Mills, Fuller-Tyszkiewicz, & Holmes, 2014), participate in physical activity (Fuller-Tyszkiewicz, Skouteris, & McCabe, 2013), and report higher self-esteem (Fuller-Tyszkiewicz et al., 2015). Thus, it is conceivable that the level of (dis)satisfaction an individual feels at a given moment about her appearance may influence the likelihood of engaging in more realistic and potentially positive comparison types (i.e., lateral and downward) and also these monitoring behaviors that are characteristic of those with trait-level body image disturbances (i.e., self-monitoring and upwardly comparing appearance with more attractive others).

Furthermore, Tiggemann and Polivy (2010) showed that the amount of upward comparison behavior during a lab-based task in which participants viewed fashion magazine advertisements was positively correlated with level of body dissatisfaction reported immediately prior to the task. As this finding was obtained in a laboratory setting in which participants were instructed to engage in upward comparisons, the generalizability of this finding to real-world contexts, where the absence of such prompts may mean participants do not engage in a comparison, warrants testing.

Hence, the present study utilizes EMA to evaluate the combined, interactive, and relative contributions of trait- and state-level body image predictors of engagement in instances of appearance-focused comparisons. We make several novel contributions to this existing literature. First, although our primary focus is on upward comparisons (as per prior studies), we explore engagement in all three types of comparison (upward, downward, and lateral) relative to noncomparison contexts rather than limiting comparisons to upward versus downward. This is important because, insofar as downward (and potentially lateral) comparisons promote positive mood and behavioral outcomes, understanding of their antecedents may hold clinical utility.

Second, although several prior studies have used trait body dissatisfaction as a predictor of comparison behavior (e.g., Leahey et al., 2007), the present study included both body dissatisfaction and

internalization as trait-level predictors. This enabled exploration of whether internalization of appearance standards is sufficient basis for promoting regular appearance comparisons, or whether it is the level of (dis)satisfaction one feels about her appearance that motivates this behavior. Third, given that state-based variables such as body satisfaction are characterized by change and fluctuation (e.g., Colautti et al., 2011), we explored whether the impact of state body satisfaction on comparison behaviors would be greatest when the independent variables and dependent variables are measured closer in time.

We hypothesized that: (a) participants with greater trait-level internalized thin ideals and/or body dissatisfaction would tend to make more upwards comparisons in daily life than those with low internalization and/or trait body dissatisfaction; (b) participants would be less likely to engage in upward comparisons (relative to no comparison) when they were state satisfied with their appearance; (c) the effect of trait body dissatisfaction and internalization on instances of upward comparison would be weaker when individuals felt body satisfied; and (d) the impact of state and trait body image on comparison behaviors would decrease as the time interval between the two constructs increases.

In the absence of prior literature modeling predictors of the other forms of comparison, the influence and direction of these effects remain unclear. Hence, no hypotheses are provided regarding engagement in downward or lateral comparisons relative to noncomparison assessments. Finally, a trait-based measure of appearance comparison behavior collected at baseline (Study Phase I) was included in order to confirm that individuals who reported most comparisons during the EMA testing period (Phase II) are, in general, more likely to engage in appearance comparisons.

## Method

### PARTICIPANTS

A total of 211 women were recruited via advertising of the study across three university sites and from the general population via advertising on the websites of eating disorder-related organizations. Forty participants were excluded due to: (a) completing less than three EMA surveys ( $n = 27$ ), (b) no baseline measures completed ( $n = 11$ ), (c) failure to report their unique ID number, thus preventing linkage of EMA and baseline data ( $n = 10$ ), or (d) being male ( $n = 2$ ). This resulted in a final sample of 161 ( $M_{\text{age}} = 22.1$ ,  $SD = 6.7$ ).

One hundred and one participants were currently employed (62.7%), and 81 (50.3%) reported being single. The remainder reported being in a relationship

( $n = 54$ , 33.5%), married ( $n = 11$ , 6.8%), living with a partner ( $n = 12$ , 7.5%), or divorced/separated ( $n = 3$ , 1.9%). The majority of participants had a high school diploma as their highest current qualification ( $n = 98$ , 60.9%), followed by bachelor's degree ( $n = 37$ , 23%), postgraduate degree ( $n = 14$ , 8.7%), and diploma/certificate ( $n = 12$ , 7.5%). Most participants classified themselves as Caucasian ( $n = 121$ , 75.2%), although 32 participants (19.9%) self-classified as of Asian ethnicity, and 8 (5%) identified with other ethnic groups. Self-reported body mass indices (BMI –  $\text{kg/m}^2$ ) for the group ranged from 15.65 to 44.11 ( $M = 22.4$ ,  $SD = 4.3$ ).

## MATERIALS

### *Trait Measures (Phase I)*

*Trait Thin Ideal Internalization.* The 5-item thin ideal internalization subscale of the Sociocultural Attitudes Towards Appearance Questionnaire–Version 4 (SATAQ4; Schaefer et al., 2015) was used to assess the extent to which participants endorse and accept cultural ideals of physical appearance (e.g., “I think a lot about looking thin”). Items were rated on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). This subscale has been shown to be internally consistent, unidimensional, and correlate with other measures of body image disturbance (Schaefer et al., 2015). In their validation study on a sample of female university students, Schaefer et al. found a mean score of 3.8 ( $SD = .9$ ) for the internalization subscale. As item scores are averaged, the possible score range for this subscale is 1 to 5.

*Trait Body Dissatisfaction.* The 5-item Body Dissatisfaction subscale of the Body Change Inventory (Fuller-Tyszkiewicz et al., 2012; Ricciardelli & McCabe, 2002) was used to assess level of dissatisfaction individuals feel in general about their appearance. This scale assesses satisfaction with global aspects of appearance (such as weight/shape and muscles) and body regions (e.g., lower body for legs and thighs, etc.). Responses were rated on a 5-point Likert scale (*very happy* to *very unhappy*). Higher scores indicated higher body dissatisfaction. Psychometric adequacy of this scale has been demonstrated in previous studies (e.g., Fuller-Tyszkiewicz et al., 2012). In their cross-cultural validation study, Fuller-Tyszkiewicz et al. (2012) found average body dissatisfaction ratings for an Australian female sample of 2.0 ( $SD = 1.0$ ), with possible scores ranging from 1 to 5.

*Trait Appearance Comparison Tendencies.* The 18-item Upwards and Downwards Appearance Comparison Scales (O'Brien et al., 2009) were used

to measure participants' (trait-like) general tendency to compare their overall appearance with that of others. This measure thus provided a validity check for Phase II assessments of appearance comparison behaviors. Participants rated their agreement for the 18 items on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*) for statements about comparisons to people who look better (upwards comparison) or worse (downwards comparison) than themselves (e.g., “When I see good looking people, I wonder how I compare to them”; and “At the beach, gym, or sporting events, I compare my body to those with less athletic bodies”). Convergent and discriminant validity, as well as internal consistency and factorial validity, have been previously established (O'Brien et al., 2009). In their validation study of this measure, O'Brien et al. (2009) reported a mean score of 2.9 ( $SD = .8$ ) for the upward comparison subscale and 2.4 ( $SD = .7$ ) for the downward comparison subscale. Item scores are averaged within subscale, producing a possible score range from 1 to 5 for each subscale.

### *State-Based Measures (Phase II)*

*State-based body satisfaction.* Participants were asked to indicate their current level of body satisfaction on an 11-point Likert scale from 0 (*completely dissatisfied*) to 10 (*completely satisfied*). This single item approach is consistent with several prior investigations of body satisfaction (e.g., Pomerleau & Saules, 2007; Sonnevile et al., 2012).

*State appearance comparison behavior.* At each time point, participants were asked to indicate the level of body comparison behavior they had engaged in since they were last signaled (101-point sliding scale where 0 = *no comparisons*, 100 = *constantly making comparisons*). If participants responded with a value greater than zero, they were then prompted to indicate how they felt they compared to their most recent comparison target: (1) much worse, (2) worse, (3) the same, (4) better, or (5) much better. As per Leahey and colleagues (Leahey et al., 2007, Leahey & Crowther, 2008; Leahey et al., 2011), this second question serves as the measure of comparison behaviors. For present analyses, responses were categorized as upward comparisons if participants selected options 1 or 2, lateral for option 3, and downward for options 4 or 5. For analyses, these categories were dummy coded and compared against assessments in which participants did not engage in appearance comparisons.

## PROCEDURE

Ethics approval for the study was provided by the Ethics Committees at each of the three study sites.



Participants were recruited via announcements in undergraduate lectures, advertising on class portals, and posters within these universities. Interested participants followed a web link to the Plain Language Statement and Consent Form for the study. After reading and opting to consent, they were directed to download an iPhone app via the app store (for Phase II) and then complete via online website the baseline survey containing demographic and trait information questionnaires (Phase I). This baseline survey asked participants to input their unique ID number (as generated in the app) in order to facilitate linking of Phase I and II data.

Phase II commenced the morning after downloading the app, and entailed 6 audible alerts on their phone per day at random intervals between 9:00 A.M. and 10:00 P.M. for 7 consecutive days. Random intervals were chosen to avoid bias due to habituation to predictable response scheduling (Napa Scollon, Kim-Prieto, & Diener, 2003). Each survey, prompted by the alert, was active for 15 minutes, after which time failure to complete the survey was coded as missing data. Preventing later completion of one or more surveys is necessary to retain sampling across the whole day.

#### DATA ANALYTIC STRATEGY

Multilevel multinomial regression analysis was conducted in HLM version 7 to control for nonindependence due to repeated measurement (Hox & Maas, 2006; Jackson, 2010), and in recognition of the categorical nature of the DV (appearance comparisons). As with single-level multinomial regression, multilevel multinomial regression decomposes into a series of dichotomous logistic regressions in which two levels of the categorical DV are compared against each other. Given the focus in the present study on whether state and trait variables predict comparison events (upward, downward, and lateral comparisons) relative to noncomparison time-points, noncomparison was used as the reference category and each of the comparison types were, in turn, used as a target outcome.

In this analysis, the dichotomous versions of the appearance comparison variable (i.e., upward vs. noncomparison, downward vs. noncomparison, and lateral vs. noncomparison) at time  $t$  were regressed onto Level 1 state-based variables (the main effect of state body satisfaction at the previous time-point,  $t - 1$  [to test Hypothesis 2], controlling for engagement in appearance comparisons at  $t - 1$  and the time lag between  $t - 1$  and  $t$ ) and Level 2 trait-based variables (trait body dissatisfaction and internalization, to test Hypothesis 1). As per Hypothesis 3, two-way interaction terms were also included as predictors in the model. Trait body dissatisfaction

and internalization at Level 2 were each included as potential moderators of the relationships between: (a) state body dissatisfaction at  $t - 1$  and the appearance comparison behaviors at time  $t$ , and (b) time lag between  $t - 1$  and  $t$  and the appearance comparison behaviors at time  $t$ . Three-way interactions between these Level 2 trait measures, state body dissatisfaction at time  $t - 1$ , and time lag were also modeled in order to test Hypothesis 4.

This multilevel multinomial logistic regression was built up hierarchically, entering the main effects first (Step I), followed by the two-way interactions (Step II), and finally including the three-way interaction terms (Step III). In so doing, the main effects could be interpreted directly from Step I in the event that higher-order (i.e., interaction) effects were found to be nonsignificant, and the provision of lower-order effects (e.g., main effects for two-way interactions, and both main effects and two-way interactions for the three-way interaction term) provided nonconfounded estimates of the interaction effects.

All predictor variables were grand-mean centered to reduce issues of multi-collinearity (Field, 2013) and to facilitate interpretation of interactions (Enders & Tofighi, 2007). Furthermore, as state body satisfaction at  $t - 1$  was being used to predict behavior at the subsequent time point, only data points that had a previous entry within the same day were used ( $N = 2531$ ), thus ensuring that effects were all within-day. Data were modeled using: (1) Restricted Maximum Likelihood estimation (REML) to provide more accurate estimates of random variance components, and (2) an unstructured covariance matrix for estimation of random effects to provide greater correspondence between model and data (Field, 2013).

## Results

### COMPLIANCE RATES AND DESCRIPTIVE STATISTICS

The average number of responses completed per participant (out of a possible 42) was 21.8 ( $SD = 9.2$ ). Average time lag between within-day assessments was 142.3 minutes ( $SD = 84.0$ ). Forty-eight percent (1,214 of 2,531) assessments were within 2 hours of each other, and a further 40% (1,008 assessments) were between 2 and 4 hours apart.

Bivariate correlations between compliance rates for EMA surveys and trait measures were nonsignificant for BMI,  $r(161) = -.05$ ,  $p = .54$ , two-tailed, trait body dissatisfaction,  $r(161) = -.07$ ,  $p = .41$ , two-tailed, or trait downward and upward comparisons,  $r(161) = .07$ ,  $p = .37$ , two-tailed, and  $r(161) = -.09$ ,  $p = .24$ , two-tailed, respectively. However, compliance was significantly related with trait internalized thin ideals,  $r(161) = -.18$ ,  $p = .026$ ,

two-tailed, and age,  $r(161) = -.20$ ,  $p = .013$ , two-tailed. Thus, participants with more trait internalized ideals and who were older replied less frequently to the app-based alerts.

In total, state appearance comparisons were reported for 59.8% of assessment points. When daily appearance comparisons were reported, upward comparisons were most common (44.3% of the time), followed by lateral comparisons (40.7%), and downward comparisons (15%). Scores on the state upward comparison measure were significantly, positively associated with trait upward comparison tendencies ( $b = .03$ ,  $p < .01$ ), but unrelated to trait downward comparison tendencies ( $b = -.001$ ,  $p = .46$ ). Thus, individuals who reported more frequent engagement in upward appearance comparisons during the EMA phase were also more likely to report frequent engagement in trait upward comparisons.

As shown in Table 1, participants typically reported moderate levels of state body satisfaction, although there was considerable variability in these estimates. The sample as a whole endorsed trait-levels of internalization, trait body dissatisfaction, upward comparison tendency, and downward comparisons above scale midpoints, with reasonable spread around these central points.

The trait level variables were all significantly and positively related. Trait body dissatisfaction had small-to-moderate associations with internalization,  $r(161) = .30$ ,  $p < .001$ , two-tailed, upward comparisons,  $r(161) = .32$ ,  $p < .001$ , two-tailed, and downward comparison tendencies,  $r(161) = .29$ ,  $p < .001$ , two-tailed. Internalization had a strong correlation with upward comparisons,  $r(161) = .52$ ,  $p < .001$ , two-tailed, but a weak correlation with downward comparisons,  $r(161) = .19$ ,  $p = .014$ , two-tailed. A small-to-moderate relationship was also found between upward and downward comparisons ( $r = .26$ ,  $p = .001$ , two-tailed).

#### MLM ANALYSES

As shown in Table 2, in Step I of the multilevel multinomial regression (with just main effects modeled), the negative intercept values indicate the reference category (no comparison) occurred more

Table 1  
Descriptive Data for Key Study Variables

Level	Variable	M	SD	Range
1	State Body Satisfaction	5.4	2.6	0-10
2	Trait Internalization	3.3	0.9	1-5
	Trait Body Dissatisfaction	3.5	0.9	1-5
	Trait Upward Comparison	3.6	0.8	1.1-5
	Trait Downward Comparison	2.8	0.9	1-5

Table 2

Step I (Main Effects) of the Multilevel Multinomial Regression Predicting Instances of Appearance Comparison

Parameters	Upward comparison		Lateral comparison		Downward comparison	
	b	p	b	p	b	p
Intercept	-1.13	.000	-1.36	.000	-2.21	.000
Lag	0.17	.001	0.15	.004	0.19	.004
Up_Pre	1.38	.000	1.00	.000	0.69	.020
Down_Pre	0.75	.013	1.16	.000	1.42	.000
Same_Pre	1.22	.000	1.76	.000	0.99	.001
State Bod Sat	-0.14	.000	-0.02	.521	0.02	.635
Trait Intern	0.50	.004	0.01	.967	0.29	.224
Trait BD	0.43	.014	0.12	.541	0.11	.626

Notes. Upward, downward, and lateral comparisons are relative to a noncomparison condition. Trait internalization (Trait Intern) and trait body dissatisfaction (Trait BD) are Level 2 predictors, whereas all other predictors are modeled at Level 1. Up\_Pre = upward comparison at previous time point, Down\_Pre = downward comparison at previous time point, Same\_Pre = lateral comparison at previous time point, and State Bod Sat = state body satisfaction rating at previous time point.

frequently than upward ( $b = -1.13$ ,  $p < .001$ ), downward ( $b = -2.21$ ,  $p < .001$ ), or lateral comparisons ( $b = -1.36$ ,  $p < .001$ ), despite comparisons (regardless of direction) being more common than noncomparison assessments. Moreover, engagement in comparisons at the prior time-point (regardless of direction) were positively predictive of subsequent comparison engagement at time  $t$ .

Individuals were less likely to make upward comparisons when they reported higher state body satisfaction ( $b = -.14$ ,  $p < .001$ ), but level of state body satisfaction was not predictive of engagement in downward ( $b = .02$ ,  $p = .68$ ) or lateral comparisons ( $b = -.02$ ,  $p = .49$ ). Individuals with higher internalization and/or trait body dissatisfaction were more likely to engage in upward comparisons ( $b = .50$ ,  $p = .004$ , and  $b = .43$ ,  $p = .011$ , respectively), but were no more likely to engage in lateral ( $b = .01$ ,  $p = .97$ , and  $b = .12$ ,  $p = .57$ , respectively) or downward comparisons ( $b = .29$ ,  $p = .22$ , and  $b = .11$ ,  $p = .66$ , respectively) than no comparison at all. None of the two-way interactions included at Step II, nor the three-way interactions entered at Step III of the model, were significant (see Table 3).

In summary, findings support main effects for state body satisfaction, trait internalization and trait internalization (Hypotheses 1 and 2), but only for upward comparisons. Proposed interactions between state and trait (Hypothesis 3) and lag, state, and trait (Hypothesis 4) were unsupported.

#### Discussion

While the influence of trait-level variables on state appearance comparisons are well documented (e.g.,

Table 3  
Steps II and III of the Multilevel Multinomial Regression  
Predicting Instances of Appearance Comparison

Step	Parameters	Upward comp		Lateral comp		Downward comp	
		b	p	b	p	b	p
II	Intercept	-1.19	.000	-1.36	.000	-2.17	.000
	Lag	0.18	.000	0.15	.005	0.19	.004
	Up_Pre	1.39	.000	1.02	.000	0.73	.015
	Down_Pre	0.80	.008	1.22	.000	1.42	.000
	Same_Pre	1.25	.000	1.81	.000	1.02	.001
	StateBodSat	-0.16	.000	-0.01	.774	0.05	.349
	TraitIntern	0.44	.011	0.02	.910	0.27	.263
	TraitBodDiss	0.38	.030	0.13	.524	0.08	.736
	State x Trait BD	-0.05	.292	0.00	.952	0.10	.097
	State x Trait Intern	-0.03	.557	0.04	.417	0.01	.934
	State x Lag	-0.01	.806	-0.05	.033	-0.03	.371
	Trait BD x Lag	0.02	.765	0.00	.966	-0.07	.408
	Trait Intern x Lag	-0.03	.558	-0.09	.116	0.00	.961
	III	Intercept	-1.19	.000	-1.36	.000	-2.20
Lag		0.16	.003	0.14	.014	0.17	.018
Up_Pre		1.40	.000	1.03	.000	0.75	.013
Down_Pre		0.80	.008	1.22	.000	1.42	.000
Same_Pre		1.26	.000	1.81	.000	1.05	.000
StateBodSat		-0.16	.000	-0.01	.798	0.06	.305
Trait Intern		0.45	.009	0.02	.911	0.27	.274
Trait BD		0.39	.026	0.14	.492	0.09	.718
State x Trait BD		-0.05	.278	0.00	.954	0.10	.114
State x Trait Intern		-0.03	.555	0.04	.404	0.01	.873
State x Lag		0.00	.999	-0.05	.060	-0.02	.453
Trait BD x Lag		0.02	.745	0.01	.846	-0.06	.472
Trait Intern x Lag		-0.04	.504	-0.10	.101	0.03	.731
State x Trait BD x Lag		-0.02	.506	-0.01	.625	-0.02	.535
State x Trait Intern x Lag	-0.02	.436	0.01	.732	-0.05	.141	

*Notes.* Upward, downward, and lateral comparisons are relative to a noncomparison condition. Trait internalization (Trait Intern) and trait body dissatisfaction (Trait BD) are Level 2 predictors, whereas all other predictors are modeled at Level 1. Up\_Pre = upward comparison at previous time point, Down\_Pre = downward comparison at previous time point, Same\_Pre = lateral comparison at previous time point, and State Bod Sat = state body satisfaction rating at previous time point.

Fitzsimmons-Craft et al., 2012; Leahey et al., 2007; Ridolfi et al., 2011), the contribution of contextual factors for these comparisons has received considerably less research attention. Guided by Person  $\times$  Situation Theory (Mischel & Shoda, 1995), the present study evaluated the possibility that the effect of trait body image (in particular, internalization and body dissatisfaction) on state comparison behavior is dependent upon how satisfied an individual feels about their appearance in the moment. By using a categorical operationalization

of comparison behavior, we were able to evaluate engagement in the three different types of comparison behavior (upward, downward, and lateral) relative to periods of noncomparison. A secondary aim was to explore the role of time lag in the magnitude of association between state body satisfaction and state comparison behavior. As detailed below, findings offer some support for our hypotheses, although this depended on the type of comparison and was limited to main effects rather than proposed interaction effects.

Consistent with prior cross-sectional and EMA studies (e.g., Cattarin, Thompson, Thomas, & Williams, 2000; Fitzsimmons-Craft et al., 2012; Myers et al., 2012; Vartanian & Dey, 2013), individuals with high trait internalization of the thin ideal and/or elevated trait body dissatisfaction were more likely across assessment points to report having recently engaged in an upward comparison. However, these individuals were no more likely to engage in downward or lateral comparisons than no comparison at all. It has been argued previously that individuals who internalize may be predisposed to upward comparisons for several reasons. First, internalization of the thin ideal implies acceptance and striving for a physique that many individuals do not possess. Hence, to the extent that an individual is motivated to evaluate how they position against the ideal, they are more likely to make an upward than downward comparison (Myers et al., 2012). Along similar lines, an individual who is dissatisfied with their appearance may seek to compare against the standard they aspire to. Second, there is an abundance of opportunity to make these comparisons, as individuals may compare against others they meet in social interactions, as well as images seen via media (movies, television, magazines, social media, etc.), and many of these instances either subtly or explicitly convey the importance of aspiring to the thin ideal (Fredrickson & Roberts, 1997; Moradi & Huang, 2008).

Other findings from the present study were inconsistent with a purely trait-based model of comparison behaviors, and instead highlight the joint contributions of state- and trait-level influences on appearance comparisons. While upward comparisons were at least three times more common than downward comparisons for the sample as a whole, over half of all assessment points in which participants reported engaging in comparison behavior were for downward or lateral comparisons. Indeed, lateral comparisons were almost as common as upward comparisons in the present study. Collectively, these findings suggest that: (a) most individuals engage in all three forms of comparison at different times in their daily life,



but (b) individuals differ in the extent to which they engage in each form of comparison. Such intra-individual variability reiterates why trait-level variables are imperfect predictors of *instances* of comparison behavior.

In general, individuals were less inclined towards upward comparisons when they were satisfied with their appearance. This greater body satisfaction does not appear to consistently lead to engagement in either of the other types of comparison (downward or lateral) relative to noncomparison behaviors. Contrary to prediction, the interaction of trait body image (internalization or body dissatisfaction) with state body satisfaction for predicting instances of any of the types of appearance comparison was nonsignificant. This suggests that trait body image neither amplifies nor reduces the predictive value of state body satisfaction for engagement in appearance comparisons. However, given prior evidence that those with heightened trait body dissatisfaction tend to report lower state body dissatisfaction during their daily lives (e.g., Melnyk, Cash, & Janda, 2004; Mills et al., 2014; Rudiger, Cash, Roehrig, & Thompson, 2007), these individuals may less often experience the benefit of state body satisfaction for appearance comparison behaviors. Thus, if the observed state body satisfaction-appearance comparison association is causal, the challenge is to find ways to increase state body satisfaction in those who typically report state body dissatisfaction.

Results failed to support the notion that state-based (contextual) influences on appearance comparison behaviors are time-sensitive, as the influence of state body satisfaction on all three types of comparison behaviors were not moderated by the time lag between predictor and outcome. Furthermore, the three-way interactions between lag, state body satisfaction, and trait body image variable (internalization or body dissatisfaction) were all nonsignificant. While it is possible that these findings suggest time lag does not diminish the potency of state-based predictors of appearance comparisons, an alternative explanation is that the time lags available in the present data failed to provide appropriate range of lag values to see depreciating effects over time.

We note that approximately half of the time lags were within 2 hours, but few were closer than 20 minutes between assessments, as per structuring of the random assessment schedule for the EMA component of the study. Thus, potentially strong prospective effects within narrow time intervals (i.e., less than 20 minutes) would have been missed in the present design. Unfortunately, to date, optimal time lag remains a largely unexplored area in the EMA literature (although see Fuller-Tyszkiewicz et al.,

2015; Shiyko & Ram, 2011) and, accordingly, limited guidance is available regarding the appropriate time lag to model state-based prospective effects. Further testing of the impact of time lag on these state-based effects is warranted to either confirm or disconfirm present findings.

Although the current study design does not permit causal inferences, the prospective element of our EMA modeling can demonstrate two preconditions for causality (namely, temporal precedence and covariance between independent variables and dependent variables). Hence, present findings have potential downstream implications for both theory and practice. These findings—when viewed alongside existing evidence of the influence of upward comparisons on state body dissatisfaction (Leahey et al., 2007, Leahey & Crowther, 2008; Leahey et al., 2011; Myers et al., 2012)—are consistent with the notion that body dissatisfaction and upward comparison behaviors may bidirectionally influence each other. Therefore, body dissatisfaction may prompt upward comparisons, which in turn compound feelings of body dissatisfaction, thus perpetuating both. While the finding that body dissatisfaction is predicted by recent upward comparisons makes intuitive sense, the observation that individuals are more likely to engage in upward comparisons when body dissatisfied is perhaps less intuitive, but still consistent with cognitive accounts of body image disturbance (e.g., Altabe & Thompson, 1996). For instance, cognitive explanations of body image disturbance suggest body dissatisfaction may be prolonged because these individuals actively seek out stimuli to support their negative self-view (Lee & Shafran, 2004) and struggle to disengage from these stimuli once identified (Gao et al., 2013).

Insofar as a causal association can be confirmed in future studies, such findings may have relevance for treatment of body image disturbance. Given the established influence of sociocultural factors on body dissatisfaction, treatment programs which educate participants about the unrealistic nature of appearance standards promoted in the media, challenge the thin ideal, and encourage individuals to adopt more realistic appearance values and goals have been found efficacious for alleviating body dissatisfaction (e.g., McLean, Paxton, & Wertheim, 2013; Stice, Rohde, Gau, & Shaw, 2009). Present findings suggest that it may also be beneficial to emphasize the role of state body dissatisfaction in promoting upward comparisons so that individuals are aware of, and able to identify, situations in which they are at greater risk of upward comparisons. More broadly, attention to factors that promote state body dissatisfaction (in addition to upward comparisons)



may further reduce an individual's tendency towards upward comparison behaviors.

Present findings should also be placed within the context of study limitations. While research consensus has not been achieved with respect to minimum, acceptable compliance rates in EMA studies, evaluation of trait-level correlates of individual differences in compliance is commonly undertaken. Of concern, this correlational analysis revealed for the present sample that participants with greater trait level endorsement of the thin ideal were less compliant in the EMA phase. Although the effect size for this association was weak, it does raise concerns about generalizability of results to those with elevated body image disturbances. It is reassuring that compliance was unrelated to trait body dissatisfaction, and that the observed relationship between state body satisfaction and upward comparisons is consistent with prior research (Tiggemann & Polivy, 2010). Nevertheless, replication of the current finding in the context of an EMA study is warranted. A further limitation is that the present study limited focus to two state-based body image constructs (appearance comparison behaviors and state body satisfaction). It is likely that other contextual factors, such as who an individual is engaging with (whether stranger or known other) and level of enjoyment of the social interaction, may also be relevant for predicting appearance comparisons. Hence, reevaluation of present findings within this broader context of possible predictors will help to further establish the predictive value of momentary body satisfaction ratings for appearance comparison behaviors.

In summary, the present study demonstrates that while trait-level body image disturbances may predispose an individual towards negative, upward appearance comparisons, the individual's feelings in the moment may also independently predict this tendency. Findings further suggest that when individuals who are satisfied with their appearance, they are no more likely to engage in downward or lateral comparisons than no comparison at all. Insofar as upward comparisons are of greater consequence than the other type of comparison, present findings highlight the need to consider targeting both momentary experiences and trait-level body image disturbance in order to curb these comparison behaviors.

#### Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

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